THE SAME PROJECT BUT DIFFERENT APPROACHES TO LANGUAGE LEARNING IN COLLABORATIVE DIGITAL STORYTELLING PROJECTS

by

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Statement of Originality

This work has not previously been submitted for a degree or diploma in any university. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made in the thesis itself.

(Signed)_____ Date: April 6, 2018

ABSTRACTS

The same project but different approaches to language learning in collaborative digital storytelling projects

Abstract

Language learners working on the same project may not learn the target language in the same way and to the same extent. This raises two important questions: What factors encourage language learners to learn in multiple ways? Do language learners use and learn the target language effectively during the project? These questions are of great interest to language educators who wish to enhance the language learning process and outcomes when implementing long-term collaborative projects.

This project explored how 14 learners of Japanese learned the target language while completing collaborative digital storytelling projects. Studies of language learning during short-term collaborative learning tasks have demonstrated that language learning takes place in contexts where learners work together by discussing 'Language-Related Episodes' (Swain & Lapkin, 1995, 1998) with peers (e.g., Fernández-Dobao, 2012). However, the ways in which learners engage in language learning during long-term collaborative projects have received scant research examination. Understanding the language learning processes is of great mportance to educators to improve their ability to provide appropriate pedagogical support to learners to enhance their language learning experience.

This study implemented collaborative digital storytelling projects with 14 learners of Japanese to answer the following three research questions: 1) What patterns of dyadic interactions do Japanese language learners develop during collaborative digital storytelling projects; 2) How do they use collaborative dialogue to resolve their language problems during this projects; 3) Do they use alternative resources other than their linguistic knowledge, and if so, what resources do they use; and 4) What factors mediate how they engaged in language learning. During the long-term collaborative project, the participants created culture-related digital stories in pair using their preferred working styles. The duration of the research project was three to six sessions outside the classroom.

To understand the language learning processes engaging in by the participants from multiple perspectives, seven types of data were collected including video recordings of the pair-groups' interactions and individual semi-structured interviews. To distinguish the patterns of learner interactions while completing their projects, task and role allocation, and frequency of peer interactions to discuss task procedures and language problems were examined. Language learning inside spoken interactions with peers was analysed by drawing on the participants' 'collaborative dialogues' (Swain, 1997). Also explored was the way in which participants engaged in Japanese language learning outside of collaborative dialogue with peers by applying the concepts of 'contradictions' in Engeström's (1987, p. 98) Activity System and 'resources' (Palfreyman, 2006, 2014). This study examined the mediating factors by also drawing on interacting activity systems Engeström (2001).

This study found the seven participant pairs developed multiple language learning trajectories and engaged in division of labour when completing their digital storytelling projects. Unlike the findings reported in studies of short-term collaborative tasks, six of seven pair groups engaged in much fewer interactions to discuss LREs after dividing their tasks and roles. Despite these constraints for language learning, the participants also engaged in

language learning outside of peer interactions by using multiple resources strategically. Various factors in their activity systems such as preferred learning style, rules, tools and communities mediated the participants' patterns of peer interactions and language learning pathways while completing their projects. These findings suggest the importance of providing pedagogical support to language learners to enhance learning outcomes by using resources strategically both in inside and outside of collaborative dialogue with peers.

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TABLE OF CONTENTS

LISTS OF TABLE

LISTS OF FIGURE

LISTS OF IMAGES

Chapter 1

Introduction: Analysing task management and language learning in collaborative digital storytelling projects

1.1 My story as a learner, teacher and researcher

My first encounter with 'a digital storytelling project' was at a conference for English language educators in South Korea in 2010. Majoring in English at a Japanese university and working as a Japanese language teacher in South Korea, I came to realise our different pedagogical approaches; The English native-speaker teachers did not teach us English, but always created contexts in which we communicated in English; whereas my Japanese colleagues and I have designed our lessons around the target language grammar. Although we have adopted different teaching approaches, I have always thought that my English learning experiences at the university made me embrace their teaching paradigm; learn the language by using the language. However, my first reaction to a digital storytelling project, learning English by making a video, was quite negative. During the presentation, an English native-speaker lecturer introduced a digital storytelling project he had implemented in an English class at his university and he shared the digital stories produced by his students. My first reaction while watching his presentation was; "learning English by making a video? Are you kidding me? How can we learn English by making a video?"

Shortly after the presentation, I had another opportunity to attend a workshop on digital storytelling projects at a regional conference. The workshop was particularly designed to provide hands-on experiences of video-editing using Windows Movie Makers for language educators who had not previously edited video clips. My second encounter with a digital storytelling project was positive. I found myself saying; "Oh, we can edit a video so easily.

Did I really make this video by myself? It looks so professional! Umm, making my own video is so much fun! In fact, making my own video took me back to my student days and the joyful memories I have of creating documentaries and dramas at the broadcasting club. Surprisingly, I was fascinated by the joy of creation. In turn, my experience convinced me that my students would also enjoy making a digital story in Japanese.

To be honest, my initial reason to implement a digital storytelling project was simply to motivate my students to learn Japanese by engaging them in an exciting and innovative project. At that time, I had taught Japanese in the Tourism and Japanese Interpreter Department at a two-year technical college in Busan, the second largest region in South Korea. The Japanese class at the college included beginners with zero Japanese language proficiency, students who were returning from a long break from study due to military service, and advanced learners. They all studied Japanese in the same classroom using the same Japanese textbook. I immediately felt my limitations as a Japanese language teacher to motivate them to learn Japanese. However, I thought a 'digital storytelling project' may make a positive transformation to our Japanese classroom. During Second Semester, 2010, I started implementing digital storytelling projects at the college. As part of the project, groups of three to four learners would visit tourist spots in Busan and produce a digital story to introduce the tourist spots to Japanese tourists who wish to visit Busan.

In terms of the teaching method, some learners commented that their preference was for a teacher-centred approach to which they had become accustomed. However, I was impressed by their active engagement in learning. Some beginner language learners (i.e., low-level language proficiency) who used to be passive and quiet during Japanese classes started to take active roles in the project; sharing their knowledge of tourist spots; advising how to structure their stories; shooting videos or photos; and editing their digital stories using their advanced video editing skills. Thus, digital storytelling projects created spaces where beginner language

learners could participate in the learning process as well as contribute to their peers' learning by excising expert knowledge in their field. The project also provided them with different types of learning opportunities that they would otherwise find difficult to access in a teacher-centred classroom; namely, observing how advanced language learners (high-level language proficiency) write compositions at their proficiency levels and receiving language assistance which caters to their learning needs and interests (e.g., Nishioka, 2012; 2014a; 2016).

Advanced learners who may not have felt challenged in their Japanese lessons also enjoyed the freedom to express themselves and to demonstrate their language proficiency and creativity. Some advanced learners actively shared their linguistic knowledge to support their beginner learner peers. For advanced learners, providing language assistance to their less language proficient peers provided them with opportunities to use the target language and to expand their linguistic knowledge (e.g., Nishioka, 2016).

Producing a digital story for an authentic audience also provided the advanced learners with the opportunity to work on their weakness as language learners. For example, one female advanced learner spoke fluent Japanese, but with a strong foreign accent. Notably, she did not make it a priority to improve her Japanese pronunciation as she could speak Japanese fluently prior to the project. However, she and advanced male peer realised that they needed to respond to the strength of her foreign accent when they listened to her recordings of the story narration, commenting; "Our audience may not able understand our story clearly." Therefore, the advanced male peer who had studied in Japan and who spoke Japanese with good pronunciation offered to coach her to improve her pronunciation. She practiced her narration by mimicking his pronunciation receiving his feedback after school. I know that participation in a digital storytelling project is not 'a magic pill' for every student in every learning context. However, I found digital storytelling projects have great potential as a pedagogy as they provide learners with an incentive to work hard, engage them in active learning, allow peers

to share their different areas of expertise, and provide learning opportunities which cater to their different learning needs and interests.

After experiencing the pedagogical power of digital storytelling projects first-hand, I decided to share the students' learning experiences and the pedagogical benefits with other language educators by conducting action research. To enhance my knowledge of digital storytelling and academic writing, I read academic journals and books intensively and extensively related to digital storytelling and collaborative learning. Applying the knowledge I gained from the readings and my experience of conducting a small research project during my Master's degree, I commenced the action research of the projects which I implemented from 2010 to 2014 at a two-year technical college in South Korea. Generous writing support from academic staff of alma maters and anonymous referees from academic journals helped me to transform the results of my action research into journal articles (Nishioka, 2012, 2014b, 2016) and a practical handbook (Nishioka, 2014a).

My first study (Nishioka, 2012) investigated the types of knowledge Korean learners of Japanese constructed with peers during a collaborative digital storytelling project by analysing the process of their spoken interactions. The study identified a wide range of knowledge constructed by the peers including Japanese vocabulary, appropriate expressions on a designated theme; translating according to their Japanese language proficiency level and searching for appropriate images to include in their digital stories. The focus of Nishioka (2014b) was to explore the roles of a less proficient Korean learner of Japanese in supporting the learning of more proficient Japanese language learners during a collaborative digital storytelling project. The in-depth analysis of their spoken interactions showed that a less proficient learner contributed to the learning of their more proficient peers by proactively contributing to the language learning process as an equal member, actively using prior-

knowledge in their first language, recounting first-hand experiences, and through the use of online resources.

Nishioka (2016) drew on the concepts of 'collaborative dialogue' (Swain & Lapkin, 2002) and 'private speech' (McCafferty, 1992, 1994a, 1994b) to examine how Korean learners of Japanese constructed knowledge of the Japanese language by discussing language use with peers. The findings highlighted the mediating roles of the learners' first language, the grammatical terminology used in the Japanese class, and the learners' private speech in supporting language learning during a collaborative digital storytelling project. Based on my extensive reading and the project experiences in South Korea, I wrote a practical handbook for educators who wish to implement collaborative digital storytelling projects in their teaching contexts. The action research developed my understanding of the learning process in the projects from a language teacher's perspective as well as from a broader theoretical perspective. The more I understood about the learning process during the project in the Korean learning context, the more I wanted to explore the pedagogical benefits practically and theoretically in different learning contexts in Australian universities. Having studied at Australian universities, I know that students from different nationalities and backgrounds co-learn in the same classroom. I realised that such a learning environment would be an ideal setting to explore the efficiency of the pedagogy and diversity of the participants' learning experiences when implementing the project. Therefore, I decided to apply for PhD. programs at Australian universities. Macquarie University provided me the opportunity to fulfil my goal.

This thesis presents the findings to emerge from seven collaborative digital storytelling projects conducted in Australian universities with Macquarie University's support throughout 2016. To analyse the learning processes engaged in by the participants in this project, this study adopted the 'third generation of Activity theory' (Engeström, 2001) and 'collaborative dialogue' (Swain, 1997, 2000) as the primary theoretical frameworks. The theoretical lens

apparent in the 'third generation of Activity theory' provided this study with a framework to understand the language learning process at the macro level by incorporating historical and socio-cultural perspectives, and the roles of multiple mediations, into the learning process. The concept of 'collaborative dialogue' provided a theoretical lens through which to understand the language learning process at the micro level by considering the language learning and interactions by the participants as a social process. Using this eclectic framework, this study aims to shed new light on language learning during long-term collaborative learning, particularly collaborative digital storytelling projects.

1.2 Background

Project-based learning is widely implemented in language education due to the multiple learning outcomes including proficiency of target language (e.g., Dewi, 2016; Zhang, 2015), abilities to learn independently and to work as a team (Hafner & Miller, 2011), integrated skills such as critical-thinking and research skills (Jun et al., 2017), and abilities to express one's perspectives using both target language and modes of communication (Hafner, 2014; 2015). The development of Web 2.0 technologies has enabled language educators to increasingly implement project-based learning in their curricular by integrating Web 2.0 technologies such as Wikipedia project (e.g., McDonald, 2007) and collaborative digital storytelling projects (e.g., Lee, 2014) which this is the focus of discussion in this thesis.

Many researchers conducting studies of language learning using digital storytelling methods have examined language learning by adopting a product-oriented method of analysis. This method includes three approaches: 1) analysing participants' perceptions of the pedagogy; 2) quasi-experimental research design; and 3) contents analysis. The first approach is typically used to elicit the perceptions of language learners regarding such matters as efficiency of language learning, learning outcomes, and areas in need of improvement (e.g.,

Chao & Hung, 2014; Hayes, 2011; Lee, 2014). The second approach, quasi-experimental research design, is generally used to assess the effectiveness of digital storytelling for language development by comparing pre- and post-test scores (e.g., Kim, 2014), or comparing test scores of experimental and control groups (e.g., Tsou et al., 2006; Verdugo & Belmonte, 2007). The third research approach, content analysis, is often adopted to explore how language learners express their perspectives using both their target language and other modes of communication such as images (e.g., Hafner 2014; 2015; Hayes & Itani-Adams, 2014; Nelson, 2006, 2008; Vinogradova, 2011; Vinogradova et al., 2011).

Notwithstanding that product-oriented analyses have advanced our understanding of learning outcomes and target language use in digital stories, little is known about the ways in which language learners develop knowledge of their target language during digital story project. To the best of my knowledge, no studies to date have examined language development in collaborative digital storytelling projects by adopting a process-oriented approach. To fill the research gap, my previous studies (Nishioka, 2012, 2014b, 2016) adopted a process-oriented approach by identifying how Korean learners of Japanese construct knowledge of Japanese by analysing their spoken interactions with peers at the micro level.

Thus, analysing the process of language learning by students when completing a digital storytelling project is a research area which has received relatively little empirical attention from scholars in the field. My previous studies (Nishioka, 2012, 2014b, 2016) examined how Korean learners of Japanese engaged in language learning during collaborative digital storytelling projects. However, I decided to conduct this study in Australian universities for two reasons. First of all, I could easily access to students in Australian universities as I was accepted in a Ph.D. program in a Australian university. Secondly, I thought that conducting this research at Australian universities, consisting of students with different nationalities and

education background, would help me to identify diversity of learning processes and trajectories learners of Japanese experiences during this project.

1.3 Problem statement

A primary concern in research on language learning in project-based learning dynamics is insufficient empirical attention being paid to the examination of how learners engage in language learning while working on their project. Although several studies have previously explored language learning in collaborative contexts, the learners typically engage in short-term collaborative learning tasks (e.g., Dao & McDonough, 2017; Hsieh, 2015, 2017; Teng, 2017). To date, a few studies investigated how learners of English engaged in collaborative writing in long-term collaborative writing projects using cloud-based applications such Google Docs and Wikis; including types of feedback learners provided to peers (e.g., Mak & Coniam, 2008; Kessler et al., 2012) and patterns of peer interactions the participants developed during the project (e.g., Bikowski & Vithanage, 2016; Bradley et al., 2010; Li & Zhu, 2013, 2017). However, actual time allocated for writing using these cloud applications is relatively short; for example, one week for Li and Zhu (2017) and three weeks for Li and Zhu (2013).

Long-term collaborative projects require learners to manage their project. Such nature of the projects may encourage learners to engage in language learning by taking different approaches than they might when working on short-term collaborative learning tasks. Studies of short-term collaborative learning tasks found patterns of peer interactions impact on the extent which learners can retain linguistic knowledge they constructed with peers (e.g., Storch, 2002; Watanabe & Swain, 2008). Given the potential for the different time frames assigned to the tasks and projects to impact the language learning process, it is imperative to examine how language learners interact with peers to engage in language learning in long-term

collaborative learning projects including collaborative digital storytelling projects. Such inquiry may yield useful pedagogical implications to improve efficiency of language learning during the project.

To address the research gap, this study investigated the language learning processes learners of Japanese engaged in during a long-term collaborative project by taking both quantitative and qualitative analytical approaches. The examination is conducted from the perspectives of the immediate, external, and online learning environments.

1.4 Research questions

The design of this study is based upon two underlying assumptions. The first assumption is that the participants will engage in 'collaborative dialogue' with peers; "dialogue in which speakers are engaged in problem solving and knowledge building" (p. 102) of their target language (Swain, 2000). The second assumption is that the participants will engage in language learning in multiple learning contexts in addition to having collaborative dialogue with peers during the project. Based on these assumptions, this study addresses the following four research questions:

RQ 1. What patterns of dyadic interactions do Japanese language learners develop during collaborative digital storytelling projects?

RQ2. How do they use collaborative dialogue to resolve their language problems during this projects?

RQ 3. Do they use alternative resources other than their linguistic knowledge, and if so, what resources do they use?

RQ 4. What factors mediate how they engaged in language learning?

1.5 Significance of this study

Previous studies related to language learning in project-based learning have mostly examined participants' perceptions of project-based learning as a pedagogy, their perceived learning outcomes in the project, or the efficiency of the pedagogy using an experimental research design. This study explores language learning by learners of Japanese in a project-based learning dynamic beyond the research designs. Specifically, it examines their collaborative learning processes while engaged in project-based learning at both the micro and macro levels by accessing the participants' perspectives and identifying the various factors mediating the learning process.

Regarding the research design, this study aims to provide a holistic and comprehensive understanding of the participants' learning experiences during the long-term projects. Towards this aim, focus is given to: 1) the participants' perspective of learning process in which they engaged; 2) the challenges the participants encountered when attempting to manage the task procedures as well as language learning; 3) the participants unproductive behaviours for language learning and task management; 4) strategies used by the participants to enhance language learning and task management; and 5) the factors impacting language learning and task management during the project.

It is anticipated that the findings reported in this study will extend our understanding of learning processes engaged in by language learners during project-based learning tasks, and the factors impacting the learners' task management and language learning at the micro and macro levels. For language educators who wish to implement collaborative digital storytelling projects in their curriculum, this study provides practical pedagogical support including: 1) strategies to engage learners in collaborative knowledge construction; 2) methods to enhance the quality of collaborative knowledge constructions; 3) scaffolding to explore the learning resources

available to learners to expand and enhance their language learning during the project; and 4) suggestions on how to enhance language learning as gleaned from the learners' perspectives.

1.6 Definition of terms

To support readers to understand the processes and activities discussed in this thesis, this section provides the meanings of the 13 key terms used in this study.

1.6.1 Task-based learning / Project-based (language) learning

Task-based learning and project-based learner are similar in the sense that learning is organised around pedagogical activities designed to encourage learners to use their target language for meaningful communication. To distinguish 'task-based learning' and 'project-based learning', this study considers 'task-based learning' to be a pedagogical approach using shorter communicative activities completed by learners during a lesson; whereas 'project-based learning' is considered a pedagogical approach using communicative activities requiring learners to complete several sub-tasks before producing their final products. Learners work on the sub-tasks over several weeks using the target language meaningfully for authentic communication purposes to produce their final products. The 'project' in this study is a digital storytelling task in which learners of Japanese produce digital stories related to aspects of the Australian and Japanese cultures using the target language to share knowledge and perspectives with authentic audiences.

1.6.2 Digital storytelling

The rationale for requiring the participants to create the digital stories around aspects of the Japanese and Australian cultures was to develop their abilities to communicate their perspectives using the target language in addition to digital formats. Regarding the educational purpose, this study defines digital storytelling as follows:

> Digital storytelling is to narrate a short story using a digital video format to express learners' perspectives. To narrate their story, learners use the target language and orchestrate different communication modes such their own voices, images, animation, subtitles and music. Language learners create the digital stories with peers over several weeks to develop knowledge of the target language and culture, and the ability to communicate their perspectives with authentic audiences online and offline using a digital video format.

1.6.3 Collaborative learning project

Given the long-term nature of the digital storytelling project underpinning this study, some learners may choose to adopt time-efficiency strategies to complete the project by dividing the tasks between them, providing feedback to each other, and combining individually-completed sub-tasks to deliver the final product. Considering the possibilities, this study defines collaborative learning project as:

> Contexts where learners work on the same project with peers by sharing perspectives, solving problems, and providing feedback to each other to achieve shared and individual goals. However, working on the same part of their task together synchronously is not an essential requirement for 'collaborative learning'. Learners may choose to work on different parts of their tasks synchronously in some production stages by dividing their tasks. Learners also may choose to work on their tasks asynchronously in different locations to work flexibly. Irrespective of whether or not they are working together at the same location, what is important in collaborative learning is that the participants mutually learn during the project by actively providing feedback and exchanging their ideas.

1.6.4 Work cooperatively / Work collaboratively

As Dillenbourg (1999) pointed out, 'cooperative' and 'collaborative' are sometimes used as a synonym by scholars. However, pilot analysis of this study found that working/learning approaches taken by each learner impacted on their learning process significantly. Therefore, this study used the both concepts to distinguish their working/learning approaches. This study refers 'work cooperatively' to the context each learner completes different parts of their tasks individually by splitting their work (and allocating different roles to each learner). The pairs working cooperatively may briefly interact with their peers to discuss their task procedures or language problems. 'Work collaboratively' is used to refer contexts where both learners work on the same part of their tasks synchronously by discussing their task procedures or language problems.

1.6.5 Short-term collaborative learning tasks / Long-term collaborative learning projects

Pedagogical tasks can be classified according to the length of time the learners need to invest to complete the activities. In this thesis, 'short-term collaborative learning tasks' refer to those tasks which require learners to work with peers by focusing on only one activity to produce the final product (e.g., a short-composition task. Such tasks usually take less than 30 minutes to complete. 'Long-term collaborative learning projects' in this thesis refer to those tasks requiring learners to complete a series of sub-tasks with peers to produce their final product for authentic communication purposes. Such tasks can take several hours to several weeks to complete. In short-term collaborative learning tasks, learners usually work on the same part of the task with their peers to achieve completion. However, learners working on a long-term collaborative learning project may divide the tasks between them and complete the

different parts synchronously or at another more convenient time to complete the project in a more time-efficient way.

1.6.6 Three production stages

Although creating a digital story involves several production stages, this study focuses on 'three production stages' directly related to the processes of learning and using the target language: 1) story development stage; 2) writing stage; and 3) modifying stage. The first stage involves the learners developing the storyline which they intend to produce as a digital story. Some pairs may develop their story by sharing their knowledge with peers; whereas other pairs may research their topic using the Internet or by interviewing Japanese native speakers. In the writing stage, the participants write the Japanese script for their digital story. Some pairs may choose to write the script in Japanese from the outset; whereas other pairs may elect to first write the script in English. In the modifying stage, the participants revise their script to enhance the clarity of their story and the accuracy of their Japanese language use. Some pairs may revise their script by themselves; whereas other pairs may access feedback from their Japanese friends or the Japanese researcher.

1.6.7 Task and role allocation

This study refers to 'task allocation' when discussing whether the participants divided the project tasks between them to complete the tasks in a more time-efficient way. For example, some pairs may divide their writing tasks according to their sub-topic; whereas other pairs may elect not to divide their tasks. Use of the term 'role allocation' in this study refers to whether the participants divided their roles to complete the same task. For example, some pairs may complete the writing task by allocating different roles such as 'a writer' or 'an

opinion provider'; whereas other pairs may write different parts of the script as 'a writer' simultaneously.

1.6.8 Task-Management Episodes (TMEs)

In this study 'Task-Management-Episodes (TMEs) refer to 'any part of a dialogue where learners discuss their task procedures with peers'. This concept draws on a conceptualisation of 'task management' by Swain and Lapkin (2000) and Storch and Wigglesworth (2003) and was developed by this researcher to analyse task procedures, catering particularly to the processes engaged in by the participants when creating their digital stories. The concepts are further explained in Chapter 3 (Section 3.3.1, 3.3.2), and an in-depth explanation of the analytical procedures are provided in Chapter 5 (Section 5.1.1).

1.6.9 Collaborative dialogue and Language-Related Episodes (LREs)

'Collaborative dialogue' is a concept developed by Swain (2000) to describe the dialogue between language learners which discusses their language use for language learning. Swain defined collaborative dialogue as dialogue in which learners are "engaged in problem solving and knowledge building" (p. 102). To operationalise 'collaborative dialogue', Swain and Lapkin (1998) proposed the concept of 'Language-Related Episodes' (LRE); "any part of the dialogue where learners talk about the language they are producing, question their language use, or correct themselves or others" (p. 292). This study applies the concept of 'collaborative dialogue' to contexts in which the participants discuss their language use and solve their language problems for language learning. Chapter 5 applies the concept to identify patterns of peer interactions engaged in by the seven participant pairs in this study; whereas Chapter 6 adopts the concept to compare the quantity and quality of language learning engaged in by the participants by sharing their linguistic resources. Chapter 7 uses the concept

to examine how the participants used alternative resources other than their linguistic knowledge to enhance language learning during collaborative dialogues. A detailed description of the analytical procedures applied to the collaborative dialogue and LREs is provided at the beginning of the relevant chapters.

1.6.10 Patterns of peer interactions

A number of studies have identified the 'patterns of peer interactions' developed by language learners during short-collaborative learning tasks by analysing the 'level of equality and mutuality' (e.g., Storch, 2002; Watanabe & Swain, 2007; Zheng, 2012). However, given different nature of task designs in short- and long-term collaborative learning tasks, different analytical approaches should be developed to examine patterns of peer interactions learners develop in long-term collaborative projects. Therefore, the 'patterns of peer interactions' identified in this study focus on the participants' task and role allocations, and the distribution of TMEs and LREs during the three production stages. The characteristics of each interaction pattern for task management are discussed in Chapter 5; whereas the participants' interactions for language learning are discussed in Chapters 6 and 7. Chapter 8 discusses the factors impacting the patterns of interactions for language learning during this long-term collaborative learning projects.

1.6.11 Mediation

The concept of 'mediation' is important to understanding the findings discussed in this thesis. It should be noted that the participants do not work directly on the project or language learning. Rather, the process of creating digital stories and learning Japanese in this project are 'mediated' by the resources and people with which they have interacted. In other words, the task and language learning processes are supported and influenced in different ways

according to the participants' interactions with resources and people. For example, using Google Docs as a learning resource mediates the writing and language learning processes in a different way when compared to the use of paper and pens when writing the digital story script. Moreover, when peers discuss and write the script together this mediates the writing process in a different way to when they write parts of the script separately.

1.6.12 Agency

In this study, language learners are considered as agents are capable to "[make] personal sense out of what they encounter and uses affordances in ways that are personally meaningful and relevant". Learners "engage with contexts and can also change and influence contexts" (Mercer, 2012, p. 43). This study adopted a concept of 'agency' to refer to their "will and capability" (Gao, 2010, p. 154) to make change or influence their learning environment they have situated during this project. The participants' active interactions with their learning environment as an agent of learning will be discussed in Section 7.4 in Chapter 7.

1.6.13 Resources

Palfreyman (2006; 2014) conceptualised 'resources' as used by learners to engage in language learning. Although resources provide a wide range of affordances, action possibilities which learners can use to support their language learning, their interactions with the resources is influenced by various factors including their ability to perceive the affordances (Palfreyman, 2014).

Drawing on his concept, I use the term 'resources' to refer to any tangible or intangible materials the participants use to engage in language learning during completion of the project. Resources used by the participants for language learning during this project include Google, Google Docs, Japanese input applications, images sourced through Google, and audio-

recordings. This study employed the concept to analyse what affordances of resource the participants perceived and how they used them to support their language learning. In-depth descriptions of the resources used for language learning are provided in Chapter 7.

1.7 Organisation of this thesis

Chapter 2 reviews the research studies relevant to this study to explore what has been examined in the field to date. I illustrate the relevance of some of the major studies to language learning in collaborative learning contexts, and to language development in project-based learning digital storytelling projects particularly. The theoretical perspectives underpinning this study are outlined, along with the analytical methods, the major findings and the contributions to the literature in Applied Linguistics. Chapter 2 concludes by highlighting the research gap and the rationale to conduct this study.

Chapter 3 discuss the theoretical framework and concepts which guide the analysis and discussion in this study, including 'third generation of Activity theory' (Engreström, 2001) and 'collaborative dialogue (Swain, 1997, 2000).

Chapter 4 describes the research methodology adopted for this study including the research design; the procedures undertaken to prepare the project; the project design; recruitment of participants, types of data collected, and the analytical methods. Also explained are the strategies used to enhance the trustworthiness of this study, and how the researcher's ethical responsibilities were fulfilled.

Chapters 5, 6, and 7 discuss the major findings of this study, focusing on different aspects of the participants' learning processes. Chapter 5 discusses the four types of peer interactions observed in this project by analysing the distribution of TMEs and LREs per pair, their task and role allocations, and task management strategies.

Chapter 6 examines the quality of language learning engaged in by the seven participant pairs during this project, both quantitatively and qualitatively. The quantity and quality of the language learning per pair are compared by analysing the 'level of engagement' in discussing LREs with peers (Storch, 2008), the number of LREs correctly resolved or unresolved (Swain & Lapkin, 1995), the reasons for unresolved LREs, and the functions of the LREs initiated by the pairs.

Chapter 7 investigates the use of alternative resources by the participants and their role in language learning both inside and outside collaborative dialogue with peers. The distribution of the types of resources used by the seven pairs to solve their language problems in collaborative dialogue is first presented, followed by the impact of using online resources on 'level of engagement' in discussing LREs (Storch, 2008). The discussion then shifts to the way in which use of the alternative resources both inside and outside collaborative dialogue allowed the participants to engage in language learning, otherwise difficult to access by discussing LREs with peers only or by using their linguistic knowledge only.

Chapter 8 analyses factors mediating how the participants engage in learning Japanese during collaborative digital storytelling projects drawing on a human activity system (Engeström, 1987, 1996, 1999, 2001), a concept of 'contradiction' (Engeström, 1987, 1996, 2001), and 'interacting activity systems with a three-layered learning environment model developed for this study (See details in Section 3.2.6 in Chapter 3). First, Chapter 8 focuses on discussing factors encouraging or discouraging them to discuss LREs with peers to engage in learning Japanese during the project. The major mediating factors per each component of a human activity are presented. This study then provides two case studies to help readers understand how interactions of multiple mediating factors encourage them to discuss LREs for language learning differently. Secondly, Chapter 8 will discuss factors encourage the

participants to take individual and cooperative learning approaches although their peers were situated in the same physical space.

Finally, Chapter 9 discusses the implications of the findings reported in this study for theory, pedagogy and research. A summary is presented of the main findings and the mediating factors impacting on the participants' task management and language learning during this project. Chapter 9 also discusses the significance of this study in the light of earlier research. The latter section of the chapter outlines the pedagogical implications to enhance language learning during long-term collaborative learning projects. This thesis concludes with a discussion of the limitations of this study, and with directions for future research based on the key findings reported and my experiences implementing the collaborative digital storytelling project.

Chapter 2

Literature review:
Language learning in long-term projects and short-term tasks

2.1 Introduction

This study examined the task management and language learning processes undertaken by learners of Japanese during a collaborative digital storytelling project from a sociocultural perspective. The aim of this chapter is to review the extant literature on second language acquisition (SLA) relevant to this study and on language learning in collaborative learning contexts and particularly in collaborative digital storytelling projects. This chapter provides an overview of the influential literature in the field in the following order: language learning in short-term collaborative learning tasks (Section 2.2); language learning in long-term collaborative learning projects (Section 2.3); and language learning in digital storytelling projects (Section 2.4). Section 2.5 highlights the research gap and discusses the rationale for this study. This chapter concludes by presenting the three research questions this study aims to address.

2.2 Sociocultural theory

The focus of this section is to discuss studies examining language learning drawing on Sociocultural Theory. The fundamental concept underpinning Sociocultural Theory is that "the human mind is mediated" (Lantolf, 2000, p. 1). The theory posits that human mental activities are mediated using physical and symbolic tools such as language, and interactions with other people (e.g., Lantolf, 2000; 2006; Lantolf & Thorne, 2000). This perspective provides a useful framework to analyse how 14 learners of Japanese construct knowledge of Japanese by using multiple mediating tools including their first and second language, online resources, and by interacting with peers and Japanese native speakers during collaborative digital storytelling

projects. Section 2.2.1 outlines the studies to compare the efficiency of language learning in individual and collaborative learning contexts. Section 2.2.2 reviews studies utilising Sociocultural Theory to examine the process of language learning engaged in by learners during short-term collaborative tasks, drawing on the concepts of 'scaffolding' (Wood et al., 1976) and 'Zone of Proximal Development (ZPD)' (Vygotsky, 1978). Section 2.2.3 discusses the literature on Sociocultural Theory to explore the process of collaborative language learning undertaken by the participants in short-term collaborative learning task by adopting the concept of 'Language Related Episodes (LREs)'. Section 2.2.4 describes studies that applied the concept of LREs to analyse the quality of language learning which learners engaged with during computer-mediated collaborative learning tasks. Section 2.2.5 outlines the studies that have investigated the relationship between the patterns of peer interaction developed by learners with their peers along with their learning outcomes.

2.2.1 Comparing efficiency of language learning in individual/collaborative work

A substantial number of SLA studies have empirically explored language learning in contexts where learners work with their peers on short-term collaborative learning tasks (e.g., Kim & McDonough, 2008; McDonough, 2004; Park, 2015; Storch, 2002). Although the findings of these studies showed positive learning outcomes from collaborative learning processes, a few studies showed that some learners distrust the efficiency of collaborative learning for language learning (e.g., Kim & McDonough, 2008; McDonough, 2004). Storch (2005), an English as a Second Language (ESL) teacher and SLA researcher, also observed that some of her learners preferred to work on writing tasks individually rather than working in pairs or in groups. She found that some participants perceived collaborative learning is appropriate for speaking activities but not as writing activities. To convince these learners of

the merits of collaborative learning, Storch (2005) asserted the need for further research to compare the efficiency of language learning during individual and collaborative work contexts.

A few SLA studies, including studies by Storch, have attempted to demonstrate the merits of collaborative work for language learning over individual work in collaborative writing tasks. Storch (2005), and Wigglesworth and Storch (2009) compared the quality of text written by learners of English individually and in pairs by analysing fluency, sentence complexity, and accuracy. Findings from both these studies showed that learners produced shorter texts with higher accuracy when working in pairs although their studies found different findings regarding sentence complexity[1]. As for the reason for the higher accuracy output during collaborative writing, Wigglesworth and Storch (2009) asserted that learners working in pairs invested approximately 30% of their time on the task discussing LREs. Fernández-Dobao (2012) explored the efficiency of collaborative work by comparing the quality of compositions and the number of LREs discussed and correctly resolved by learners in three text writing contexts: individually, in pairs, and in groups of four. Her study found that learners produced texts with highest accuracy when they wrote in groups. Comparing the number of LREs discussed and resolved by learners when working in pairs and in groups, the results showed that the participants in the group dynamic correctly resolved a greater number of LREs by producing more LREs than the participants working in the pair dynamic. Based on these results, Fernández-Dobao (2012) concluded that the better written performance by learners in groups is due to the capability of the group to pool their linguistic resources and to solve their language problems with different peers.

Another methodological approach taken by studies comparing the merits of collaborative work over individual work compared learners' test scores using quasi-experimental design.

[1] Findings of Storch (2005) showed that learners produced more complex sentences when they worked in pairs, whereas Wigglesworth and Storch (2009) did not find significant differences in sentence complexity written individually or the ones written in pairs.

Kim (2008) compared the efficiency of learning Korean vocabularies during a dictogloss task in two research settings; 1) engaging in thinking-aloud to complete the task indivisibly; and 2) discussing LREs with peers to complete it in pairs. The findings suggested an advantage of working with peers for vocabulary learning. The learners working in pairs showed that learners worked on the task with peers outperformed the ones who completed the task individually both in the immediate- and delayed test. For this reason, Kim (2008) asserted that the participants working in pairs retained lexical knowledge more efficiently as they resolved a greater number of lexical LREs with peers than learners working individually.

Teng (2017) quantitatively and qualitatively explored phrasal verb learning effectiveness when learners work on a cloze task, an editing task, and a writing task individually, in pairs and in a group. The quantitative data analysis results showed the participants working on the three tasks in a group achieved higher mean scores than the participants working in pairs or individually. Comparing task types and the test scores showed that the writing task was more effective in helping learners to learn verb phrases than the cloze or editing tasks. Qualitative data analysis of LREs also showed favourable learning conditions during peer interactions in a group; a learner developed knowledge of phrasal verbs by receiving different linguistic information from two peers.

In summary, literature on collaborative language learning highlighted the following advantages of working in groups compared to working in pairs or individually: 1) producing accurate compositions by discussing and resolving more LREs; 2) demonstrating a higher retention rate of the linguistic items discussed with peers; and 3) constructing linguistic knowledge by pooling linguistic knowledge from more members.

2.2.2 Constructing knowledge by providing scaffolding within learners' ZPD

Sociocultural Theory has its origin in works of Russian psychologist, Leo Vygotsky. Although Vygotsky (1978) proposed the concepts of 'mediation' and 'internalisation' of knowledge through mediation to explain the cognitive development of children, Lantolf and colleagues applied the concepts in their investigation of how learners internalise knowledge of their target language by using learning language (e.g., Frawley & Lantolf, 1985; Lantolf & Frawley, 1984; Lantolf & Pavlenko, 1995). A large body of research on language learning during short-term collaborative learning tasks has examined the language learning process engaged in by language learners by adopting Sociocultural Theory as the theoretical framework (e.g., Ohta, 2001; Swain & Lapkin, 2002; Watanabe & Swain, 2007; Yamamoto, 2009).

One of analytical approaches used in research based on Sociocultural Theory is to analyse the learners' language development during collaborative learning tasks by analysing their interactions in micro discourse level applying concepts of 'scaffolding' (Wood et al., 1976) and 'Zone of Proximal Development (ZPD)' (Vygotsky, 1978). ZPD was initially conceptualised by Vygotsky to discuss the cognitive development of children. Vygotsky defined ZPD as "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (p. 86). Wood et al. (1976) proposed the concept of 'scaffolding' to illustrate the temporary support provided by the adult to help children complete the tasks beyond their cognitive development level.

Ohta (1995) applied the concept of ZPD and scaffolding to analyse the language learning process used by learners to develop knowledge of the target language by interacting with peers while working on collaborative learning tasks. To accommodate ZPD in language

learning contexts, Ohta (1995) redefined ZPD as "the difference between the L2 learners' developmental level as determined by independent language use, and the higher level of potential development as determined by how language is used in collaboration with a more capable interlocutor" (p. 96). She adopted the term, "assistance" to describe the scaffolding provided by peers to help the learner achieve his or her higher level of potential development (Ohta, 2001, p.9).

Research based on Sociocultural Theory has adopted the concept of 'scaffolding' as the temporary support provided by an expert to a novice; such as pedagogical questions provided by a teacher to the whole class (e.g., Guk & Kellogg, 2007) or different explicit levels of corrective feedback provided by a tutor to a learner (e.g., Aljaafreh & Lantolf, 1994; Nassaji & Swain, 2000) to help learners achieve a higher level of potential development. The concept of 'scaffolding' is also adopted to indicate the temporary support provided by 'peers to peers of a similar proficiency level' (e.g., Donato, 1994) or 'from a less proficient peer to a more proficient peer' (e.g., Ohta, 2001; Yamamoto, 2009).

Ohta (1995, 2001) examined the classroom interactions between the teacher and learners, and learner-to-learner in a Japanese class conducted at an American university. Ohta found that the participants provided language assistance not only to peers of a similar level, but also to much more proficient peers. As the factors, Ohta (2001) listed two factors enabling the provision of such scaffolding: 1) exercising their different strengths as a learner; and 2) using their additional working memories as a listener. Yamamoto (2009) explored how a less proficient learner supported the language learning of a more proficient learner from a different perspective to Ohta (1995, 2001); namely, what roles does a less proficient learner play in constructing opportunities for language learning by more proficient peers instead of providing scaffolding using their different Japanese language strength. She analysed the classroom interactions between a Japanese teacher and learners of Japanese at a French university. Data

were collected while the participants were discussing the topic identified in compositions written by peers and when providing feedback to peers. Her study identified two strategies enabling a novice to promote language learning in more proficient peers: 1) eliciting useful linguistic information from the Japanese teacher both for less and more proficient learners by code-switching to English which the teacher can understand; and 2) outputting Japanese so that their peers can develop their hypothesis and language knowledge from the output.

As discussed above, a large body of research drawing on Sociocultural Theory has adopted the concept of 'scaffolding' to examine the role of scaffolding by a teacher or a peer. However, Hannafin and Land (1997) applied the concept in technology-learner interactions by stating that "technology-enhanced environments often provide the conceptual scaffolding and means (resources, tools) to promote personal and individual reflection" (Hannafin & Land, 1997, p. 194). Focusing on the role of scaffolding provided by both peers and online resources, Hsieh (2015, 2017) explored the peer interactions engaged in by the learners of English during collaborative learning tasks in pairs. The findings identified that the process the participants engaged in during collaborative dialogue with peers was to use knowledge provided by online resources. Her study demonstrated that using online resources while working in a collaborative learning dynamic allowed the participants to engage in collaborative dialogue and to produce language outputs beyond the ZPD of both learners.

To sum up, studies of collaborative language learning drawing on 'scaffolding' and 'ZPD' provide useful insights into the way in which learners achieve linguistic performances beyond their current proficiency level. Focus was primarily on how they receive support in collaborative learning contexts from their teachers, peers of a similar proficiency or lower proficiency level, and online resources. In particular, Hsieh (2015, 2017) suggested there was greater pedagogical potential to integrate online resources into collaborative learning contexts;

engaging learners to discuss collaborative dialogue and to use the target language beyond both learners' ZPDs.

2.2.3 Knowledge construction by engaging in collaborative dialogue

Another strand of research drawing on Sociocultural Theory examined language learning in collaborative learning contexts and the use of 'collaborative dialogue' (Swain, 1997, 2000) and the operationalised concept, LREs (Swain & Lapkin, 1995, 1998, 2001, 2002). Swain (2000) defined collaborative dialogue as dialogue language learners engage in with peers to construct the target language. Swain illustrated that collaborative dialogue was "where language use and language learning can co-occur" (Swain, 2000, p. 97). LREs are concepts operationalised in collaborative dialogue as coined by Swain and Lapkin (1995, 1998, 2001, 2002). The researchers defined LREs as "any part of a dialogue where the students talk about the language they are producing, question their language use, or correct themselves or others" (p. 326). Applying the concept, their studies explored the mental process engaged in by learners to solve the language problems they encountered in the collaborative learning tasks. They can involve addressing the language problems, providing alternative expressions, deliberating the meaning and use of words or phrases, and applying extended knowledge to complete the immediate tasks (e.g., Swain, 2000, 2001; Swain & Lapkin, 1995, 1998, 2001, 2002).

A large body of literature on Sociocultural Theory has adopted concepts of LREs to investigate how the peer dialogue language engaged in by learners while working on collaborative tasks promotes language learning (e.g., Kim & McDonough, 2008; Storch, 2008; Swain & Lapkin, 2002; Watanabe & Swain, 2007). A few studies compared the quality of LREs discussed by each pair while working on collaborative tasks by perceiving the quality of LREs as an indicator of language learning quality (e.g., Kim & McDonough, 2008; Lesser, 2004). Lesser (2004) compared the quality of LREs discussed by pairs with different

proficiency levels; that is, high-high, high-low, low-low pairs. His study found that high-high language proficiency pairs initiated LREs most frequently among the three proficiency groups. Types of LREs the high-high language proficiency pairs most frequently discussed were grammatical LREs, and they resolved more LREs correctly. On the other hand, low-low language proficiency pairs discussed lexical LREs and resolved the least LREs.

Kim and McDonough (2008) compared the quality of LREs when the same learner worked on dictogloss tasks with an advanced or intermediate learner. Like Lesser (2004), Kim and McDonough (2008) found that learners initiated more LREs and resolved more LREs when they worked with advanced-level peers. In contrast to Lesser (2004) Kim and McDonough (2008) found participants initiated more lexical LREs when they interacted with advanced-level peers.

Other researchers working on LREs have explored how the discussion of LREs impacts the learners' language development by conducting post-tests or post-tasks (e.g., McDonough, 2004; Swain & Lapkin, 1998, 2002; Williams, 2001). To demonstrate the knowledge participants constructed when discussing LREs, Swain and Lapkin (1998, 2002) conducted a tailor-made test following the participants' discussions of LREs with peers while working on a collaborative learning task. The results showed that the participants correctly used linguistic knowledge constructed in collaborative dialogue with peers in the tailer-made post-test.

Williams (2001) extended the research by Swain and Lapkin (1995, 1998) to investigate the effectives of LRE discussions with peers on language learning by adopting the fine-grained research design. She compared the participants' retention rate of LREs in the tailer-made post-test by focusing on their proficiency level as well as their roles in discussing LREs, initiating LREs, or supplying the answers. Her study highlighted the following advantages of more proficient participants in LRE discussions: 1) initiating LREs and supplying more answers; and 2) efficiently retaining the language items discussed in LREs.

Several researchers have adopted the concept of LREs to investigate the factors impacting learners' retention of LREs (e.g., McDonough, 2004; Watanabe & Swain, 2007). McDonough (2004) examined the relationship between the level of participation in LRE discussions and the subsequent retention rate. The researcher compared the pre- and post- test scores of participants who actively participated in LREs involving negative feedback and modified output episodes with those who did not. The result showed that participants who actively participated in LRE discussions outperformed participants who did not in their overall retention of the LREs discussed during collaborative learning tasks. Although the findings for the retention rate of LREs were positive, the results of an open-ended questionnaire raised an important pedagogical perspective; the participants did not consider collaborative learning tasks were useful to improve their language skills, although they agreed that the task provided them with opportunities to practice speaking in English.

Watanabe and Swain (2007) explored the impact of interlocutors' proficiency levels on their retention rate of language items discussed with peers as revealed in their post-test scores. The core-participants wrote their script and discussed the differences with the reformulated text by the native speakers with a peer of higher language proficiency or lower language proficiency. The test results indicated that the participants marked higher scores in the post-test when they worked with a lower language proficient partner. Another important finding reported in their study is that the core-participants are more likely to gain higher scores in the post-test when they played the role of either 'collaborator' or 'expert'. Thus, the Watanabe and Swain (2007) study suggested important pedagogical considerations to enhance language learning during collaborative dialogue including: 1) how to pair learners of different language proficiency levels; and 2) how to support learners to take on the role of collaborator or expert during collaborative learning tasks.

Storch (2008) investigated the relationship between the participants' level of engagement in LRE discussions and the impact on LREs retention. For the analysis, Storch classified LREs into the following two types: 1) LREs with 'elaborate engagement' in which participants elaborated on the language use or provided alternative expressions; or 2) LREs with 'limited engagement' in which participants did not deliberate language use or meaning. To compare the retention rate of LREs per level of engagement when discussing LREs, Storch first asked the participants to work on a text-reconstruction task by discussing LREs with peers, and secondly, to work on the isomorphic version of the task individually during the following week. After comparing the participants' level of engagement in LRE discussions and their performances in the post-task, Storch found the LREs with 'elaborate engagement' were more likely to be learned by both participants. Thus, her findings highlighted that the participants' level of engagement in LRE discussions impacted their LRE retention rate.

Kim and McDonough (2011) analysed the efficiency of providing pre-task modelling on participant LRE production by adopting a quasi-experimental design. The experimental group received explicit instructions to interact with peers collaboratively after watching the sample video; whereas, the control group did not receive any instruction regarding how to interact with peers. The researcher examined the number of LREs initiated by each pair and those correctly resolved by them while working on three types of short-term collaborative learning tasks. Their study showed the experimental group produced more LREs and resolved more LREs than the control group. In addition, learners in the experimental group demonstrated more collaborative patterns during their interactions with peers than the experimental group. The findings suggested that explicit instruction can increase the number of LREs initiated and correctly resolved by language learners, and consequently, that this may enhance the quality of their language learning during collaborative learning tasks.

In summary, studies adopting the concept of LREs to examine collaborative language learning demonstrated the positive impact of LRE discussions with peers on language development. However, the results showed that not every participant engaged in effective language learning during LRE discussions. The efficiency of language learning during LRE discussions was affected by the language proficiency level of the participants and their interlocutors, their level of participation in LRE discussions, and the level of their engagement when discussing LREs with peers. These studies highlighted the importance of pedagogical support to encourage learners to actively engage in LRE discussions as well as to help them to discuss LREs with 'elaborate engagement'. As evidenced in Kim and McDonough (2011), pre-task instruction may help to enhance language learning during LRE discussions by: 1) developing learners' active involvement in discussing LREs with peers; and 2) discussing LREs with 'elaborate engagement' which Storch (2008) found effective to lead both learners to achieve higher LRE retention rates.

2.2.4 Collaborative knowledge construction in computer-mediated interactions

As discussed in Section 2.2.3, early studies on collaborative language learning have applied the concept of 'collaborative dialogue' in ?various contexts to refer to spoken dialogue that learners use while engaging with peers to describe and resolve their language problems. The operationalised concept, LREs, were used to analyse the quality of spoken interactions that learners develop to resolve their language problems with peers, while working on collaborative learning tasks (e.g., Lesser, 2004; Swain & Lapkin, 1995, 1998, 2001, 2002).

More recent studies have increasingly applied the concept of 'collaborative dialogue' and LREs to examine collaborative knowledge construction that language learners use to engage in computer-mediated collaborative learning tasks with peers (e.g., Hsieh, 2015, 2017; Yilmaz

& Granena, 2010; Zeng, 2017). In particular, studies focusing on synchronous computer-mediated communication analysed the quality of peer interactions for language learning by reinterpreting LREs as written interactions developed by learners in text-based chat. To engage learners in text-based collaborative dialogue with peers, researchers used a wide range of software including built-in text chat functions in built-in chat rooms available in Moodle (Zeng & Takatsuka, 2009), MSN messengers (Yilmaz, 2010), Google Docs (e.g., Rouhshad & Storch, 2016), and Tencent QQ (e.g., Zeng, 2017).

A growing number of studies in synchronous computer-mediated interactions have explored the efficiency of text-based collaborative dialogue for language learning. For example, Zeng and Takatsuka (2009) examined to what extent learners of English retain LREs discussed with their peer in synchronous text chat in the immediate and delayed post-test contexts. Their study demonstrated the efficiency of text-based LREs for language learning. They found that lexis-based LREs which they resolved correctly were recalled better both in the immediate and delayed LREs, compared with grammar-based LREs. Yilmaz (2011) examined how task types impacted on the quality of text-based LREs discussed by learners of English while working on dictogloss and jigsaw tasks by text-chatting with peers synchronously. The study found jigsaws encouraged the participants to discuss grammatical LREs frequently, whereas dictogloss encouraged them to discuss more orthographical LREs during synchronous text-based collaborative dialogue. The results also showed the advantages of LREs discussed in the dictogloss for language learning compared with LREs used in the Jigsaw: encouraging them 1) to resolve more LREs accurately; and 2) to engage them in self-correction more frequently; and 3) to provide more negative feedback. Based on the findings, the author asserted that synchronous text-based collaborative dialogue is effective for encouraging learners to reflect on their language input and output, consequently leading them to engage them in meta talk, self-correction, and provision of negative feedback. A few studies compared the efficiency of

discussing LREs in face-to-face interactions and synchronous text-chat, however they showed contradictory findings (e.g., Rouhshad & Storch, 2016; Zeng, 2017). Rouhshad and Storch (2016) compared the quality of LREs that learners of English discussed while they were engaging in collaborative writing tasks, in face-to-face spoken interactions and synchronous text chat interactions. Findings from their study showed greater benefits to discussing LREs in face-to-face interactions than via synchronous text-based interactions. More LREs were initiated and resolved correctly in face-to-face interactions, compared with LREs discussed in synchronous text-chat based interactions.Furthermore, their study also found that face-to-face interactions triggered LREs with 'elaborate engagement' which Storch (2008) found condusive for language learning.

On the contrary, the findings of Zeng (2017) compared the quality of LREs Chinese learners of English discussed during jigsaw and dictogloss exercises across two modes; face-to-face spoken interactions and synchronous written interactions. Contrary to Rouhshad and Storch (2016), their study showed greater advantages of synchronous text-chat over for language learning over face-to-face spoken interactions; encouraging the participants 1) to produce more LREs per 100 words; 2) to resolve more LREs accurately; and 3) engage in self-correction. By conducting surveys of the participants, the author found that the text-based interactions promoted learners to notice their language errors as they had more time to reflect on their language learning, while they tended to ignore their language errors in face-to-face spoken interactions. The author listed the visual display of learners' language errors as an advantage of text-based interactions for language learning, encouraging learners to communicate despite a lack of social context, and enabling the capability to retrieve previous written messages to reflect on their language use.

To sum up, studies of synchronous text-based interactions have suggested efficiency of text-based collaborative dialogue for language learning. Despite this, results from Rouhshad

and Storch (2016) and Zeng (2017) demonstrate contradictory findings in the numbers of LREs discussed and resolved by the participants in both modes. The findings may be due to different designs in their collaborative learning tasks. Therefore, further studies needs to explore how the design of collaborative learning tasks conducted across different communication modes impact on the quality of LREs learners discuss with their peers by implementing a wide range of task designs.

2.2.5 Patterns of peer interactions

While an extensive body of literature has demonstrated language development during short-term collaborative learning tasks, some studies revealed that not all pairs interact with peers effectively for language learning in such learning contexts (e.g., DiNitto, 2000; Nelson & Carson, 1998; Nelson & Murphy, 1993; Storch, 2001a). Several studies on language learning in collaborative learning contexts explored the patterns of peer interactions developed by learners while working on collaborative learning tasks with peers in different learning contexts (e.g., Storch, 2002; Watanabe & Swain, 2007; Zheng, 2012).

Storch (2002) examined the patterns of peer interactions by learners of English in collaborative learning tasks in an English course at an Australian university. The aim of the study was to compare the patterns of peer interactions they developed in the tasks with the learning outcomes of the tasks per interaction pattern. Drawing on the concepts of 'equality' and 'mutuality' (Damon & Phelps, 1989), Storch (2002) first identified four types of peer interactions by the participants: collaborative, expert/novice, dominant/passive, and dominant/dominant. To compare the efficiency of language learning per interaction pattern, the participants were asked to work on the isomorphic version of the task twice; first by working with their peers and then by working individually one week later. The findings showed the pairs who developed either collaborative or expert/novice interaction patters showed more

instances of knowledge transfer in the post-task than pairs who developed either dominant/passive or dominant/dominant interaction patterns.

Watanabe and Swain (2007) further extended the study of Storch (2001a, 2002) by comparing language development in writing performance using pre-test and post-test design. To identify the patterns of peer interactions developed by Japanese learners of English, the authors applied the four traits proposed by Storch (2001b): 1) pattern of contribution; 2) decision-making behaviour; 3) nature of assistance; and 4) discourse and linguistic features. Their study found slightly different patterns of peer interactions to those discussed by Storch (2002): 1) collaborative; 2) expert/passive; 3) expert/novice; and 4) dominant/passive. To compare writing development per interaction pattern developed with peers, the researchers first asked the participants to write an essay in pairs. They then discussed the differences between their scripts and had the version of their script reformulated by an English native speaker. As the post-test, the participants then wrote the essay individually and the researchers compared the pre-test and post-test scores per interaction pattern. The post-test results showed the core-participants who took on the role of either 'collaborator' or 'expert' in an expert/novice interaction pattern achieved higher scores compared with participants who played the role of 'dominant', 'novice', or 'expert' in the expert/passive' interaction pattern.

Zheng (2012) examined the patterns of interactions developed by Chinese learners of English in a writing class at a Chinese university. Based on classroom observation and discourse analysis, the author identified five patterns of interactions including a new pattern reported by neither Storch (2002) nor Watanabe and Swain (2007): passive/passive. Zheng (2012) described the characteristics of the 'passive/passive' pattern as the participants' "frustration or inability of reaching a solution to a problem" (p. 118). Based on the findings, Zheng (2012) asserted the importance of providing pedagogical support to encourage learners to develop interaction patters which are more conductive to language learning.

In a later study, Storch (2004) investigated the factors to encourage language learners to develop different patterns of peer interactions while working on short-term collaborative learning tasks with peers. The author applied perspectives of Activity Theory developed by Vygotsky (1978) and Leont'ev (1981). To identify the factors mediating the interaction patterns, Storch compared the transcriptions of the recorded participant interactions and their accounts of the interactions during the post-task interview. Based on the analysis, Storch concluded that the patterns of peer interactions developed by the participants during collaborative learning tasks were mediated by their attitude towards the collaborative tasks and to working in pairs, their perceived goals of the project, and their perceived roles in the project. Her study suggested that the way in which learners interacted with peers and engaged in language learning was mediated not only by factors in the immediate learning environment, but also by personal factors shaped by prior learning experiences. With the rapid development of computer technologies, a growing number of researchers have sought to identify patterns of peer interactions during collaborative writing tasks in computer-mediated learning environments (e.g., Li & Zhu, 2013, 2017; Rouhshad & Storch, 2016; Tan et al., 2010). Li and Zhu (2013) explored the nature of peer interactions by Chinese learners of English as manifested during Wiki-based collaborative writing tasks by applying 'equality' and 'mutuality' (Damon & Phelps, 1989) indexes and the language functions used in Wiki 'Discussion'. Their study identified three interaction patterns including a unique pattern; 'dominant/withdrawn', which was not observed during face-to-face interactions by participants in the aforementioned studies (e.g., Kim & McDonough, 2008; Storch, 2002). Thus, their study provided an interesting insight into a unique interaction option available to learners during computer-mediated interactions; that is, withdraw from the interactions.

Tan et al. (2010), Rouhshad and Storch (2016) compared patterns of peer interactions learners of English developed while working on two isomorphic versions of collaborative

learning tasks in face-to-face and online interactions[2]. Their studies reported a unique interaction pattern observed only during online interactions; 'cooperative pattern' in which either both learners complete different parts of their task by dividing their tasks (Tan et al., 2010) or took on different roles to complete writing tasks (Rouhshad & Storch, 2016). Tan et al. (2010) reported that the pair that developed 'cooperative pattern' had fewer interactions to discuss their language problems in CMC mode, compared with their face-to-face interactions. On the other hand, their study also found positive impact of online interactions; promoting more equal participation among pairs who developed 'expert/novice' and 'dominant/passive' in face-to-face contexts.

Rouhshad and Storch (2016) compared two aspects of collaborative writing during face-to-face interactions and when writing with Google Docs and the embedded text-chat application: 1) peer interaction patterns by learners of English during interactions across the two modes; and 2) the quality of LREs each pair discussed while engaged in collaborative writing in the two modes. Similar to Tan et al. (2010), Rouhshad and Storch (2016) also found that 'cooperative' pattern[3] is more prominent in Google Docs interactions than in face-to-face interactions.

To sum up, literature on patterns of peer interactions suggested that participants' learning contexts and interaction modes impacted the patterns of peer interactions develop by learners while working on collaborative writing tasks and their opportunities for language learning. While online interactions promote equal participation in collaborative learning tasks, the findings highlighted the drawbacks; discouraging learners to discuss language problems, in particular LREs with 'elaborate engagement' which Storch (2008) asserted to be more effective

[2] Tan et al. (2010) did not provide in-depth descriptions of chatting software used in their study. Therefore, it is not clear whether the participants interacted with their peers only by text-chatting or both text- and spoken chat.
[3] Rouhshad and Storch (2008) used 'cooperative pattern' to describe contexts where learners complete their writing tasks by dividing roles such as a writer, feedback provider, and editor, whereas 'collaborative pattern' to illustrate contexts where learners co-construct sentences with peers by discussing together.

for language learning. The findings suggest the need for further research to examine how different modes of communication may impact on the efficiency and process of language learning that learners are working on during collaborative learning from a broader perspective.

2.3 Language learning in long-term collaborative learning projects

Section 2.2 discussed the studies to examine language learning while engaged in short-term collaborative learning tasks (i.e., completed in under 30 minutes such as short-composition tasks, editing tasks, and text-reconstruction tasks). This section reviews the literature pertinent to language learning during long-term collaborative learning projects (i.e., project-based learning). Section 2.3.1 defines project-based learning as stated by researchers in the field, and then discusses the theories underpinning project-based learning (Section 2.3.2). Section 2.3.3 outlines a range of project designs and discusses the outcomes implemented by language educators in their curricula; whereas Section 2.3.4 discusses the pedagogical debate within the literature regarding second or foreign language education and the challenges implementing project-based learning in some language teaching contexts.

2.3.1 Definitions of project-based learning

Project-based learning; that is, using and learning the target language while working on projects, has been widely implemented in second or foreign language classrooms. Researchers in the filed have reported their project designs and the learning outcomes in their projects using various terminologies such as ‘project-based instruction’ (e.g., Beckett, 2002), ‘project-oriented learning’ (e.g., Kim, 2015), and ‘capstone project’ (e.g., Moulton & Holmes, 2000). However, this study adopted the terminology, ‘project-based learning’, which researchers working in the field of SLA have more widely adopted (e.g., Foss et al., 2008; Foulger & Jimenez-Silva, 2007; Hilton-Jones, 1988; Jun et al., 2017; Petersen & Nassaji, 2016; Poonpon, 2007; Simpson, 2011; Zhang, 2015).

Project-based learning researchers have also provided a wide range of definitions of project-based learning by focusing on different aspects of learning. For example, Moss and van Duzer (1998) perceived problem solving and producing products as important aspects of project-based learning. They defined project-based learning as "an instructional approach that contextualizes learning by presenting learners with problems to solve or products to develop" (p. 2).

For Wrigley (1998), an important requirement for project-based learning is to work on an issue which matters to the learner and to present the results of the projects to a large audience. What is interesting to note here is that Wrigley (1998) hinted that the results of some project-based learning tasks may transform into a real business outcome. The author illustrated project-based learning as below:

> [P]roject-based learning involves a group of learners taking on an issue close to their hearts, developing a response, and presenting the results to a wider audience. Projects might last from only a few days to several months. In some cases, projects turn into businesses, such as the student-run café at ELISAIR, and English for speakers of other language (ESOL) program in New York City[4].

Skehan (1998) perceived project-based learning as a pedagogy to develop learner autonomy by stating; "project work is an excellent structure for preparing learners to approach learning in their own way, suitable to their own abilities, styles, and preferences (Skehan, 1998, p. 273). For Cook and Singleton (2014), project-based learning is a pedagogy to bridge the classroom and the world outside the classroom The authors described how project-based learning prepared learners to use the target language for authentic purposes by asserting that "project-based learning supplies opportunities for learners to work with others to accomplish tasks, using the target language in real-life" (Cook & Singleton, 2014, p. 99).

[4] Wrigley (1998) can be retrieved from http://ncsall.net/index.html@id=384.html

The purpose of this project is to develop the participants' abilities to use a digital format to communicate their perspectives to an audience using Japanese language. The process of creating digital stories was regarded as an opportunity for the participants to develop multiple skills by interacting with peers, native speakers, and relevant resources. Considering the pedagogical purposes, this study defines 'project-based learning' as learning activities in which learners work with peers over a few weeks to produce their final products using the target language for authentic communication. Learners produce the final products by interacting with their peers and speakers of the target language, and by using material resources produced in the target language.

2.3.2 Theoretical perspectives of project-based learning

To familiarise readers with the pedagogical principles of project-based learning, this section outlines the theoretical perspectives underpinning project-based learning. According to Petersen and Nassaji (2016), the origin of project-based learning can be traced back to the progressive education reform movement in the United States in early twentieth century. John Dewey, who was actively involved in the movement, asserted that action is the basis for learning. Drawing on this work, his student, Kilpatrick, proposed 'the project method'; pedagogy that utilises a hands-on project to engage learners in learning effectively by providing meaningful and collaborative experiences (Petersen & Nassaji, 2016). The focus of Kilpatrick's work was on the cognitive development of learners by working on the project rather than by learner collaboration (Wrigley, 1998). However, several educators have implemented project-based learning in contexts where a group of learners work on their project (e.g., Ford & Kluge, 2015; McDonald, 2007).

According to Beckett (2002), project-based learning gained some popularity among language educators following Swain's (1985) study conducted in a French immersion program.

The author explains how Swain's study demonstrated that providing learners with only comprehensive input was not adequate for language learning. Rather, learners need to engage in communication using the target language meaningfully by stretching their linguistic resources (Beckett, 2002). The findings motivated language educators to adopt project-based learning in their curricular to provide language learners with opportunities to communicate with their peers and native speakers using the target language in an authentic and meaningful way. Early publications adopting project-based learning in second language education include Brumfit (1984), Coleman (1992), Gardner (1995), Fried-Booth (1986), and Hilton-Jones (1988).

2.3.3 Project-based learning practices in language education

Project-based language learning is an area scarcely explored by researchers. Beckett (2002) stated that much literature in the field is "anecdotal reports" of how language educators English language educators particularly, implemented their projects to engage learners of English in language learning (p. 58). As Beckett noted, literature in the field reports the project design, perceived outcomes, and pedagogical suggestions. The project design in this body of literature can be classified as either: 1) projects incorporating interactions with native speakers (e.g., Hilton-Jones, 1988); 2) projects integrating interactions with outsiders who speak the same first language as learners (e.g., Alan & Stroller, 2005); 3) projects designed around first-hand experiences provided by the project (e.g., Moulton & Holmes, 2000); 4) research projects (e.g., Zhang, 2015); and 5) contents creation projects (e.g., Foss et al., 2005).

The first type of project-based learning incorporates interactions with native speakers to provide learners with opportunities to engage in meaningful communication. For example, taking advantage of English-speaking environments in the United Kingdom (UK), Hilton-Jones (1988) designed a short English language learning project for German teenage learners at a local shopping centre which included interviews with local shoppers. She reported that her

students commented in the end of course survey that their research trips to the shopping centre motivated them to learn English and enhanced their sense of independence.

The second type of project-based learning sees language educators teaching English as a Foreign Language (EFL) by incorporating interactions with outsiders who speak the same first language as the learners. Alan and Stoller (2005) implemented a real-world project in an English preparatory program at a Turkish university by incorporating interview with university academics, local government authorities, and residents of the area. The goal of the project was to provide suggestions on how to reshape the area and the tram system in the city. Based on their project experiences, the authors outlined a ten-step procedure to maximise learning in project-based activities. The activities they incorporated into the project to enhance learning included writing letters to city government officials to request information; researching a topic using the library and suitable websites; and presenting results to peers and guests such as city government officials and their university colleagues.

The third type of project-based learning is those designed around first-hand experiences provided by the project. For example, Moulton and Holmes (2000) developed a 16-week research project in an English for Academic Purpose classroom by incorporating a 'library tour' into the project. The authors stated that the students commented on how the program positively developed both their English language proficiency and their research skills required for their major. Fragoulis and Tsiplakides (2009) incorporated a 'day trip' in their local history project at a Greek primary school. The author reported that the project enhanced the language proficiency levels of learners as well as their knowledge of local history and motivation for learning.

Some English language educators situated in the EFL environment have implemented projects which do not require interactions with English native speakers such as research projects (e.g., Jun et al., 2017; Zhang, 2015). For example, Zhang (2015) implemented a ten-

week research project in an English class at a Chinese college to enhance the oral communication skills, problem-solving skills, and research skills of the learners. Based on the questionnaire results, the author reported that the participants perceived the project enhanced their English reading skills and abilities to use online resources. Jun et al. (2017) conducted two projects within 12 weeks; a survey project and a day-tour planning project, at a secondary school in China. At the end of both projects, the participants presented their project results orally using PowerPoint in class. In their post-project reflection, the participants reported that the project improved their English language proficiency their speaking proficiency, and their translation skills.

Another type of project-based learning widely implemented in EFL environments is the contents creation project. To encourage learners in EFL learning environments to use English for authentic communication purposes, English language educators designed projects requiring them to produce their final product using a computer such as a newspaper project (e.g., Eguchi & Eguchi, 2006; Foss et.al., 2008), video project (e.g., Ford & Kluge, 2015; Foss et al., 2008), and Wikipedia project (e.g., Foss et al., 2008; McDonald, 2007). Many of the publications are not based on empirical research but they nonetheless provide useful pedagogical tips for language educators on different project designs and the potential problems when implementing project-based learning using technologies, in an EFL learning environment particularly. The problems include difficulties accessing English written materials and native speakers to interview in English, lack of learner motivation to communicate using English with peers and teachers, and technical problems.

In summary, the literature on project-based language learning is primarily project reports consisting of the project design, perceived outcomes of the project, and pedagogical suggestions. Although these publications provide useful pedagogical suggestions on ways to implement project-based learning effectively, they often do not answer questions on how

learners engage in language learning while working on collaborative learning projects with peers.

2.3.4 Challenges to implementing project-based learning in language classrooms

Other methodological approaches used by studies on project-based language learning is to elicit the perceptions of language educators and learners on project-based learning using questionnaires, written reflections, and interviews. The findings have highlighted the pedagogical challenges to implementing project-based learning in some teaching contexts. For example, Beckett (2002) explored the perceptions of Asian students towards project-based learning while learning English in an ESL program at a public high school in Canada. Her study found that 57% of the participants expressed their frustration towards project-based learning due to the heavy workload or the difficulties of the project. Alternatively, their preferences were to learn basic skills from teachers and textbooks.

Petersen and Nassaji (2016), and Kim (2015) compared the perceptions of teachers and learners toward project-based learning. Petersen and Nassaji (2016) examined the perceptions of teachers and learners in ESL schools in Canada using questionnaires and interviews. The results revealed gaps in their perceptions of project-based learning including: 1) teachers perceived project-based learning as a pedagogy to engage learners with both the target language and the lesson contents; whereas learners considered project-based learning as a real-world task required to learn the relevant contents as well as what they should do in the task; and 2) teachers recognised that project-based learning could be utilised to develop four language skills; whereas learners perceived project-based learning to improve their speaking proficiency. The findings suggested the importance of communicating with learners about the learning process and the pedagogical benefits of project-based learning to motivate them to invest themselves in the language learning process.

Kim (2015) investigated the perceptions of a Korean teacher and Korean freshman students towards the 16-week oral presentation project being implemented in the English program at their university. To elicit their perceptions toward the project, the participants were interviewed and wrote reflective journals. Analysis of the data revealed the teacher and freshman students perceived there to be several challenges to implementing oral presentation projects in a first-year English class. Although some student participants provided positive comments in their reflection journals at the end of the semester, others expressed their frustration and anger toward the projects, including: 1) their confusion about the pedagogy; and 2) how free-rider students (i.e., those who did not believe in the pedagogical value of the project) increased the workload for other learners. The teacher participant also reported factors inhibiting his or her implementation of project-based learning effectively, including: 1) the high absentee rate among first-year students at Korean universities; 2) learners' reliance on online translation services; and 3) the large number of students in the English classes at the Korean university. Thus, findings from the Kim (2015) study highlighted useful pedagogical issues to consider when implementing project-based learning in contexts in which learners are not familiar with this particular learning format including: 1) the time to implement project-based learning; 2) communicating the pedagogical benefits to learners; 3) helping learners to visualise the learning process and learning outcomes; and 4) guiding learners on how to use online resources to engage in learning effectively.

Beckett and Slater (2005) integrated two pedagogical strategies to mitigate the potential conflicts caused by implementing project-based learning during a 14-week research project conducted with undergraduates at a Canadian university: 1) providing a project framework to help learners visualise what skills and knowledge they can develop in the project; and 2) requiring the learners to keep project diaries in which to reflect on what they have learned in the project. Based on interviews with participants and their diary reflections, the researchers

reported that 79% of the participants perceived the project framework and reflection diary helped them to visualise how much they have learned in the project. Findings of the Beckett and Slater (2005) study suggested that the integration of pedagogical supports such as a project framework and reflection diary may assist learners to develop a positive attitude toward project-based learning. This was primarily achieved by helping the learners to understand the pedagogical benefits as well as to visualise their learning process and what they have achieved in the project.

Thus, several studies of project-based learning (e.g., Beckett, 2002; Kim, 2015) revealed that participants often have negative perceptions of this particular learning format. In particular, Kim's (2015) study revealed learner frustration, anger, and resistance towards participation in the project, especially by those learners who were not familiar with the pedagogy or who had to work with learner who were not committed to process (e.g., free riders). The findings suggest the need of further studies to explore the types of pedagogical support required to develop positive attitudes among learners toward project-based language learning as well as to enhance their abilities to engage in language learning effectively during this learning format.

However, the main focus in studies of project-based learning has typically been to report the project design, the perceived learning outcomes, or the teachers' and learners' perceptions of the pedagogy. Therefore, these studies have not answered the question of how language learners use and learn their target language while working on the projects. To develop pedagogical strategies to enhance language learning in project-based learning, further studies need to explore the gradual language learning process learners engage in during project-based learning.

2.4 Language learning in digital storytelling

A digital storytelling project; that is, creating a story in a digital format either individually or in a group, is one type of project-based learning language educators have adopted in their curricular to encourage learners to use and learn the target language. Several studies have implemented digital storytelling as long-term collaborative learning projects in which learners produced a digital story by working with peers over several weeks (e.g., Enokida, 2015; Hafner & Miller, 2011; Nishioka, 2016). To familiarise readers with digital storytelling projects, this section first reviews the definitions and terminologies suggested by researchers in the field. Section 2.4.2 outlines the research designs and findings of studies to have examined the efficiency of language learning in digital storytelling projects conducted as individual learning activities. Section 2.4.3 discusses the research into language learning in digital storytelling projects conducted as collaborative learning activities. Section 2.4.4 illustrates findings of Parks (2000) which examined factors mediating language learning in long-term collaborative learning projects.

2.4.1 Background of digital storytelling

Digital storytelling projects have been implemented in classrooms using a variety of terminologies such as 'video project' (e.g., Foss et al., 2008), 'digital video project' (Hafner & Miller, 2011), 'digital stories' (e.g., Verdugo & Belmonte, 2007), 'multimedia storytelling' (e.g., Tsou et al., 2006), and 'digital storytelling' (e.g., Kim, 2014). Researchers have defined digital storytelling differently in terms of their scope and focus. Alexander (2011) has provided the broadest definition of digital storytelling; any stories which are "born digital" and "published in a digital format" (p.15). Chung (2007) elaborated that digital stories are a narrative consisting of different modes; "the practice of incorporating digital text, imagery, video, and audio into the presentation of a computer-mediate, multimedia story" (p. 17). For

Kajder (2004), digital storytelling is best described as "a three-to-five-minute personal narrative in response to a significant question of their [the learner's] choice" (p. 64). In terms of using digital storytelling for educational purposes, Robin (2006) suggested that digital storytelling is about "telling stories with a variety of digital media, such as images, audio, and video. Just all digital stories bring together some mature of digital graphics, text, recorded audio narration, video and music to present information on a specific topic" (p. 709). For Davis and Foley (2016), digital storytelling is a tool to amplify the voices of ordinary people. In turn, the researchers (2016) described digital storytelling as a "grassroots movement that used multi-media digital tools to help ordinary people tell their own 'true stories'" (p. 318).

Thus, digital storytelling has been defined differently by different researchers depending on their focus and interests. For this study, digital storytelling is conceptualised as a pedagogical tool to engage learners in the processes of using and learning Japanese as well as to explore their personal expressions using a digital video format. Therefore, digital storytelling is defined in this study as the process "to narrate a short story using a digital video format to express learners' perspectives. To narrate their story, learners use the target language and orchestrate different communication modes such as their own voices, images, animation, subtitles and music. Language learners create the digital stories with peers over several weeks to develop knowledge of the target language and culture, and their ability to communicate their perspectives with authentic audiences online and offline using a digital video format."

The digital storytelling genre was initially promoted by Joe Lambert, Dana Atchley, and Nina Mullen, funders of the Center for Digital Storytelling (formerly known as the San Francisco Digital Media Center). The aim of the Center is to promote the democracy of media production (Alrutz, 2015). Lambert (2010) recognised the importance of "a culture where expert story-making is a highly valued and regarded craft" (p. 2) but was concerned about the negative impact of the media on "our sense of ourselves as storyteller" (p. 3). In turn, the Center

provided workshops to encourage ordinary people to tell stories about their lives using a digital storytelling format (Nuñez-Janes & Thornburg, 2017).

While digital storytelling has its roots in the democratised storytelling movement, it has been increasingly adopted to meet different educational goals across a wide range of disciplines including literacy education (e.g., Sylvester & Greenidge, 2009), learner empowerment (e.g., Benmayor, 2008), teacher education (e.g., Heo, 2009), and medical education (e.g., Sandars, 2009). In the field of language education, educators have increasingly implemented digital storytelling as a pedagogical tool to develop the language proficiency of learners, either as an individual learning task or a collaborative learning task (e.g., Bloch, 2018; Kim & Lee, 2018).

2.4.2 Analysing language learning using digital stories as individual learning tasks

Early studies explored the efficiency of digital storytelling as an individual learning task for language learning, including to improve learners' speaking proficiency (e.g., Baghdasaryan; 2012), listening proficiency (e.g., Verdugo & Belmonte, 2007) and writing proficiency (e.g., Tsou et. al., 2006). These studies have demonstrated the positive effects of digital storytelling on language development using quasi-experimental designs (e.g., Abdolmanafi-Rokni & Qarajeh, 2014) or by comparing test-scores during different stages of the project (e.g., Kim, 2014).

Speaking skills development is the area of language learning which has received the most intensive empirical attention to demonstrate the efficacy of digital storytelling on language development (e.g., Abdolmanafi-Rokni & Qarajeh, 2014; Afrilyasanti & Basthomi, 2011; Baghdasaryan, 2012; Dugartsyrenova & Sardegna, 2017; Kim, 2014). Language educators have implemented digital storytelling activities to encourage learners to practice speaking in out-of-classroom learning contexts (e.g., Baghdasaryan, 2012; Dugartsyrenova & Sardegna,

2017; Kim, 2014). These studies have demonstrated the positive effects of digital storytelling on improving speaking proficiency by comparing the learning outcomes of digital storytelling activities with those of other pedagogies such as: 1) to retell digital stories produced by Storybird (https://storybird.com/) or told by the teacher (Abdolmanafi-Rokni & Qarajeh, 2014); or 2) to produce digital stories to practice speaking as homework (Baghdasaryan, 2012). Kim (2014) demonstrated the development of speaking proficiency by comparing the participants' oral speaking performances across four digital story projects.

The focus of Dugartsyrenova and Sardegna (2017) was to identify how learners of Russian perceived VoiceThread-based digital storytelling as a pedagogical tool to improve their speaking proficiency by conducting surveys and interviews with the participants. The advantages identified by the participants included: 1) practicing and rerecording at own pace before submitting; and 2) correcting own errors by listening to the recordings. However, the participants also listed the following disadvantages: 1) time-consuming; 2) preference to practice speaking in face-to-face contexts; and 3) distracted by using computers.

Although many previous studies have explored the efficiency of digital storytelling as individual learning tasks for enhancing speaking proficiency, a few studies have investigated the efficiency of such a format for improving other language proficiencies such as 'writing proficiency' (Tsou et al., 2006) and 'listening proficiency' (Verdugo & Belmonte, 2007). Tsou et al. (2006) examined the impact of digital storytelling on writing proficiency by conducting a 10-week quasi experimental study. The experimental groups watched digital stories and then retold the stories by creating their digital stories; whereas the control group listened to stories told by the teacher and then retold the stories using pen and paper. The results indicated that the experimental group showed greater improvement in sentence complexity compared with the control group. The researchers argued that the main reason for the improvement was that

the experimental groups were able to better recall the words and phrases used in the digital stories and then incorporate them into their own stories.

Verdugo and Belmonte (2007) explored the efficiency of a 22-week digital storytelling activity on improving listening proficiency by adopting a quasi-experimental design. 220 six-year-old Spanish learners of English participated in the study. The experimental groups were asked to watch individually and at their own pace the digital stories developed by the Kindersite Project (www.kindersite.org) by clicking their computer screen; whereas the control groups received teacher-centred lessons over the 22 weeks. Comparison of the pre- and post-test results for both groups showed that the experimental groups showed greater gains in listening comprehension tests. The researchers provided two reasons to account for these results: 1) the digital stories helped the children to focus on oral input; and 2) the digital stories encouraged the learners to explore the target language by watching the stories repeatedly.

In summary, studies implementing digital storytelling as an individual learning task have demonstrated the positive impact they can have on language development, particularly speaking development. These findings were achieved by comparing the learning outcomes of digital storytelling activities with those of other pedagogies, or by comparing learners' performances across different project stages. Because the objective of this research was to identify the impact of digital storytelling on language development, little is known about the process learners engage in to construct knowledge of the target language when working on digital storytelling as individual learning tasks.

2.4.3 Analysing language learning in collaborative learning projects

Although early studies of digital storytelling explored the efficiency of this learning format for language learning by implementing it as an individual learning activity, recent studies have increasingly explored the efficiency of digital storytelling on language development by incorporating learner collaboration in different production stages: 1) in the middle of the production; 2) at the end of production; and 3) across all production stages. For example, Hayes and Itani-Adams (2014) integrated learner collaboration into the middle of the production stages. The participants shared their stories with peers to receive feedback which was used to facilitate overall improvement. Lee (2014) implemented VoiceThread digital storytelling projects which required learners to produce digital stories individually every two weeks. She integrated learner collaboration into the activity by asking students to comment on each other's product at the end of each production phase using the comment functions. Other educators have also integrated learner collaboration across all production stages (e.g., Chao & Hung, 2014; Hafner & Miller, 2011).

Some studies have also explored learners' perceptions of collaborative digital storytelling project learning outcomes by integrating learner collaboration into different production stages. The results showed the participants perceived there to be many benefits and positive learning outcomes from the project (e.g., Hafner & Miller, 2011; Hayes & Itani-Adams, 2014; Lee, 2014). For example, Hayes and Itani-Adams (2014) conducted surveys of participants to identify their perceptions of the learning outcomes of collaborative digital storytelling projects conducted in a Japanese language class at an Australian university. The findings showed that the participants perceived digital storytelling projects were effective for improving their Japanese proficiency, grammar and pronunciation.

Hafner and Miller (2011) implemented collaborative digital storytelling projects to foster learner autonomy in an English-medium university in Hong Kong. The study incorporated pedagogical supports to promote collaborative learning and learner autonomy during the project. To explore the participants' perceptions of the learning outcomes from the project the authors administered questionnaires and conducted focus-group discussions. The results showed the participants had positive perceptions of digital storytelling as a learning task including: 1) enhancing motivation; 2) perceiving it as an authentic task; 3) promoting independent learning; and 4) developing abilities to work as a team. Thus, the Hafner and Miller (2011) study suggested that collaborative a digital storytelling project is effective for promoting independent learning as well as the abilities of learners to work collaboratively with peers.

Enokida (2015) administered questionnaires to explore participants' perceptions of the learning outcomes following the integration of a collaborative digital storytelling project including extensive reading into an English program at a Japanese university. During the project, the participants worked as a group to produce a digital story after analysing and discussing the story structure in a a book they had read. The results of questionnaire data analysis showed they had positive perceptions of the learning outcomes from the collaborative project including: 1) developing abilities to write in English so that readers can understand their story development; and 2) enhancing their abilities to read English books by understanding emotions (of characters). The findings show that interactions with peers encouraged the participants to structure and write their stories from the readers' perspectives.

Hayes (2011) conducted surveys to examine how learners of Japanese perceive collaborative learning projects as implemented in Japanese classes at an Australian university. The findings provided important pedagogical implications on how to effectively implement the project in university contexts including: 1) limiting options for the topic; 2) showing the time

framework for each production stage; 3) providing explicit marking criteria; and 4) using technology support during class time to improve their storytelling.

With the development Web 2.0 technologies, some educators have adopted web-based digital storytelling applications to promote learner collaboration during the project using the interactive functions with viewers. Some studies have explored language learning in VoiceThread collaborative digital storytelling projects from the teacher's perspective (e.g., Alameen, 2011) or the learners' perspectives (e.g., Lee, 2014). Alameen's (2011) four-week action research revealed two key pedagogical problems were observed by the teacher researcher: 1) reading aloud a written script rather than telling; and 2) using irrelevant images in their stories. The findings pointed to the need for pedagogical support to engage learners in storytelling using multimodal texts effectively.

Lee (2014) implemented a Voice-Thread digital storytelling project with learners of Spanish. The students created digital stories every two weeks throughout the semester about a news item they had read about or watched on television. The participants were required to provide comments about the digital news produced by their classmates using the interactive function. The results of the survey of, and interviews with the participants showed the perceived benefits and learning outcomes of the project included: 1) enhancing motivation to create digital stories for a real audience; 2) learning different perspectives from the classmates' comments; 3) enhancing the four language skills; 4) and developing confidence to speak in Spanish.

Chao and Hung (2014) explored the participants' perspectives of the efficiency of a six-week collaborative digital storytelling project conducted in an English class at a university in Taiwan. In the project, the participants were required to make two digital stories using Storybird (https://storybird.com/) and to present each of their stories orally in pairs to their classmates. After each oral presentation, the students assessed their speaking performance. To

demonstrate the efficiency of digital storytelling projects on language learning, the researchers compared the self-assessment scores from the participants for their first and second oral presentations. The findings showed that the participants provided higher scores for speaking and pronunciation for the second oral performance of their digital stories. The questionnaire results also showed they held positive perceptions of collaborative digital storytelling projects as a pedagogical tool including: 1) arousing curiosity; 2) relevance to their life; 3) the capability to monitor their learning process; and 4) satisfying learning achievement with digital storytelling projects.

While most of the aforementioned studies explored the digital storytelling project learning outcomes by eliciting the participants' perceptions or via self-evaluation, some studies adopted a quasi-experimental design to demonstrate the efficiency on language development quantitatively (e.g., Hwang et al., 2016; Yang & Wu, 2012). For example, Yang and Wu (2012) compared the efficiency of language learning during a 22-week collaborative digital storytelling project with a lecture-based approach with 10th grade English classes in Taiwan. First, both the experimental (digital story) and the control (lecture) groups received the same teacher-centred instruction using textbooks and PowerPoint presentations. The students in the experimental groups then produced digital stories as a group; whereas, students in the control groups engaged in non-digital storytelling learning activities such as discussions of the topic, writing compositions, and presenting their work orally in class. When comparing the test scores of both groups, the study found that the experimental groups outperformed the control groups not only in relation to the development of English language proficiency, but also in relation to critical thinking and learning motivation.

Hwang et al. (2016) explored the efficiency of digital storytelling on improving the English language skills of sixth grade Taiwanese learners of English. The authors applied a quasi-experimental research design in two research settings which required the participants to create digital stories or to tell stories orally and to create a digital story individually or in pairs. Comparison of the pre- and post-English test scores showed that the digital storytelling groups showed greater gains than the oral story groups. Although the aforementioned studies reported the participants' positive perceptions of the learning outcomes from collaborative digital storytelling projects (e.g., Enokida, 2015; Lee, 2014), Hwang et al. (2016) reported contradictory result; that is, the participants performed better when they produced digital stories individually compared to when they produced their stories in pairs. The participants identified the following advantages of creating digital stories individually: 1) easier to concentrate on story making, 2) fewer distractions; and 3) more opportunities to practice. The results might be influenced by the age of the participants, and their study suggested there were advantages to creating digital stories individually than in pairs in some teaching contexts.

To sum up, researchers implementing digital storytelling projects integrated learner collaboration into different production stages of the task depending on their pedagogical goals. The findings provided pedagogical benefits for incorporating peer interactions into the project including the developing of their abilities to: 1) work as a team (Hafner & Miller, 2011); 2) write the script from the readers' perspectives; and 3) gain different perspectives from their peers' comments (Lee, 2014).

Some studies such as by Yang and Wu (2012), and Hwang et al. (2016) conducted quasi-experimental research to demonstrate the efficiency of language development in collaborative digital storytelling projects by comparing participants' test-scores following engagement in collaborative digital storytelling projects. Thus, studies of collaborative digital storytelling projects have suggested the pedagogical benefits of learner collaboration during the project and the efficiency of collaborative digital storytelling projects for language development. However, very little empirical attention has been paid to an examination of the process of learner collaboration for language learning. It is imperative to investigate how learners interact with peers for language learning to enhance the quality of the language learning process during this project. The strategies they used to enhance language learning with peers and the problems they encountered when attempting to engage in language learning with peers are of particular importance.

2.4.4 Factors mediating language learning in a long-term collaborative learning project

Factors mediating language learning in long-term collaborative learning project is an area scantly explored by researchers excepting the case study by Parks (2000). The focus of her study is to identify the factors that mediated how three focal learners of English engaged in learning English in collaborative video projects conducted at an English for tourism course in Canada. The participants created a video in pairs to introduce tourist sites in English. To identify the mediating factors, she analysed interviews with an instructor and the focal students, and documents related to the project drawing on Leont'ev's Activity Theory[5] and the notion of 'investment' (Norton, 1997). Her study demonstrated how learners' prior education and learners' task perceptions impact on how they invested themselves in language learning during

[5] Park (2000) stated that she analysed her data drawing on the concepts of motive, goal and operation which Leont'ev proposed by citing Wertsch (1985). However, she did not explain which books or papers written by Leont'ev she used as references in her paper.

the video project. For example, a participant developed negative perceptions of speaking activities in classroom due to her prior education focusing on reading, writing and listening. As a result, she avoided investing herself in learning English in the project; asking bilingual friends to translate her scripts; submitting her script without revising. Another completed her project without incorporating suggestions from her peer as she has developed preference to learn individually due to her prior education emphasising individual learning. On the other hand, the their participant invested a considerable amount of time for this project by perceiving this project allows her to present herself as a competent English user. Thus, a lens of Activity Theory demonstrated how learners' investment in language learning during the project is mediated by multiple factors; including social and historical factors, and their personal factors.

Thus, her study extended our understanding of the factors mediating language learners' engagement in long-term collaborative projects. However, what is not known is how learners interact with their peers for language learning during long-term collaborative learning projects. Parks (2001) did not identify the process learners of peer interactions as the focus of her analysis is to identify factors impacting on language learning undertaken by one focal participant in each pair. However, further studies need to investigate process of peer interactions learners engage in for language learning during long-term collaborative learning projects such as collaborative digital storytelling project. Such an inquiry is important to enhance understanding of the quality of language learning engaged in by learners with their peers during long-term collaborative learning projects.

2.5 Conclusion

The literature on language learning which applies a Sociocultural Theory lens includes studies identifying the processes learners engage in to construct knowledge of the target language while interacting with peers. These studies draw on the concepts of 'scaffolding' (Wood et al., 1976), 'ZPD' (Vygotsky), and 'LREs' (Swain & Lapkin, 1995, 1998, 2001, 2002). Studies that focus on the LREs discussed by language learners and their 'patterns of peer interactions' developed during collaborative learning tasks (Storch, 2002) demonstrated that language learners engaged in interactions with peers for language learning of different quality. Consequently, language learners retained the linguistic items discussed with peers to different extents. Studies including short-term collaborative contexts have also provided useful pedagogical insights into the language learning processes engage in by students while interacting with peers. In turn, they also demonstrated the different extents to which the learners retained the language items they constructed with peers due to the different quality of the peer interactions for language learning. On the other hand, the literature on project-based learning, particularly collaborative digital storytelling projects, have scarcely explored the language learning process engaged in by learners while interacting with peers.

Studies of short-term collaborative learning tasks explored language learning by participants with the assumption that learners work on the same part of the tasks by discussing LREs with peers (See Section 2.2). However, learners working on long-term project-based learning tasks may engage in language learning in different ways to make the project feasible. Despite the possibilities, few empirical studies have investigated the processes learners undertake to construct knowledge of the target language by interacting with peers during long-term collaborative learning projects; especially collaborative digital storytelling projects. As discussed in Section 2.3.3, there are many types of project-based learning activities. However, collaborative digital storytelling projects provide greater pedagogical benefits compared with

other types of project-based learning including: 1) engaging learners in interactions with an audience online (e.g., Lee, 2014); 2) encouraging learners to reflect on their language use (e.g., Dugartsyrenova & Sardegna, 2017); and 3) amplifying learners' voices by expressing their perspective using multiple modes (e.g., Hafner, 2015; Nelson, 2006, 2008). Considering the advantages of digital storytelling projects over other types of project-based learning, this study examines the language learning process by learners of Japanese while engaged in collaborative digital storytelling projects.

To provide a holistic and comprehensive picture of language learning in this collaborative context, this study analyses the learning processes at both the macro and micro levels, as well as from the multiple learning contexts in which they engage during the project.

To achieve these goals, this study answers the following four research questions:

> RQ 1. What patterns of dyadic interactions do Japanese language learners develop during collaborative digital storytelling projects?
>
> RQ2. How do they use collaborative dialogue to resolve their language problems during this projects?
>
> RQ 3. Do they use alternative resources other than their linguistic knowledge, and if so, what resources do they use?
>
> RQ 4. What factors mediate how they engaged in language learning?

The aim of Research Question 1 is to identify the patterns of dyadic interactions developed by 14 participants during a collaborative digital storytelling project. As demonstrated in studies of short-term collaborative learning tasks (e.g., Storch, 2002; Watanabe & Swain, 2007), learner interaction patterns are a useful predictor of the extent to which they can retain the linguistic knowledge constructed with their peers. It is anticipated that learners working on long-term collaborative learning project may develop different interactions patterns in the project due to the different nature of the task and project. However, the way in which learners develop peer interactions during collaborative learning projects have not yet been answered.

Therefore, Chapter 5 investigates the patterns of dyadic interactions by the 14 learners of Japanese during a long-term collaborative learning project to understand how well they predict the efficiency of language learning during the project.

The focus of Research Question 2 is to compare the quality of language learning by the seven pairs during collaborative digital storytelling projects by analysing their peer interactions at the micro level. As discussed in this chapter, several studies of short-term collaborative learning tasks have compared the quality of the peer collaborative dialogue by analysing either their interaction process or the retention of the knowledge constructed with their peers (e.g., Storch, 2002; Watanabe & Swain, 2007). However, scant empirical attention has been paid to comparisons of the quality of peer interactions engaged in by learners for language learning in long-term collaborative learning projects. To fill this gap, Chapter 6 compares the quality of language learning by the seven pairs during a collaborative digital storytelling project by analysing their LREs quantitatively and qualitatively.

Research Question 3 examines how learners of Japanese have used alternative resources to engage in language learning during the collaborative digital storytelling project. Most studies of short-term collaborative learning tasks have examined language learning in contexts where learners resolved their language problems by sharing their linguistic knowledge only (e.g., Park, 2015; Swain & Lapkin, 2002). As a result, very little is known about the way in which learners engage in language learning using alternative resources other than their linguistic knowledge. Hsieh (2015, 2017) however does offer some insights in her study of short-term collaborative learning tasks. Therefore, this study aims to extend our understanding of the use of alternative resource by learners to enhance language learning during long-term collaborative learning projects. To achieve the goal, Chapter 7 examines how the 14 learners of Japanese used alternative resources to engage in language learning during this project.

Finally, the focus of Research Question 4 is to identify the factors mediating language learning by the seven pairs of Japanese language learners during a long-term collaborative digital storytelling project. This is an area largely underexplored in previous studies excepting Parks (2000) and it is therefore important to understand the mediation factors of significance and how they impact learner engagement to enhance language learning. Considering the significance of the empirical inquiry, Chapter 8 examines the factors mediating language learning undertaken by the 14 learners of Japanese during a collaborative digital storytelling project.

Chapter 3

Theoretical framework

3.1 Introduction

To investigate how the participants engaged in learning Japanese during this project, this study developed a compromise analytical framework consisting of Activity Theory (Engeström, 1987, 1996, 1999, 2001), collaborative dialogue (Swain, 1997, 2000), and resources (Palfreyman, 2006, 2014). Yamagata-Lynch (2010) summarised Activity Theory as "a systematic and systemic approach to understanding human activities and interactions in real-wold complex environments" (p. 1). The theory provides this study with a useful framework to understand learner interactions for language learning in collaborative digital storytelling project "in relation to its context and how the individual, his/her activity, and the context affect one another" (Yamagata- Lynch, 2010, p. 1).

The focus of this chapter is to provide the following two descriptions: 1) the fundamental concepts of Activity Theory and other theoretical concepts which guide data analysis and discussion of this study; and 2) the applications of the framework for data analysis. To summarise the structure of this chapter, Section 3.2 describes the key concepts of Activity Theory (Engeström, 1987, 1996, 1999, 2001), contradictions (Engeström1987, 1996, 2001), and 'interacting activity systems with a three-layered learning environment model' developed for this study. These concepts have been applied to analyse the factors impacting language learning interactions undertaken by the 14 participants during this project. The discussion then moves to why the theory is compatible to this study and how it is applied to analyse data. Section 3.3 defines 'collaborative dialogue' (Swain, 1997, 2000), and the operationalised concept, LREs (Swain & Lapkin, 1995, 1998, 2001, 2002), which have been adopted to compare the quantity and quality of the peer interactions for language learning during the

project. Section 3.4 first elaborates the concept of 'resources' (Palfreyman, 2006, 2014) used to analyse how the participants engaged in language learning using alternative resources other than their own linguistic knowledge both inside and outside collaborative dialogue. Second, a brief explanation is provided of how the concept was applied in the data analysis. This chapter ends by summarising the research questions that each chapter aims to answer, and the theory and theoretical concepts used to answer the questions.

3.2 Activity Theory

This study adopted the 'third generation' of Activity Theory (Engeström, 2001) and the concept of 'contradictions' (Engeström, 1987, 1996, 2001) to analyse factors impacting the processes of task management and language learning by 14 learners of Japanese during a collaborative digital storytelling project. Engeström (2001) developed the third-generation theory by building upon the concepts of Vygotsky's (1978) first generation of Activity Theory Leont'ev's (1978, 1981), and second generation of Activity Theory. It is therefore essential to understand key concepts of both the first and second generations of the theory to comprehend the third generation of Activity Theory. To help readers familiarise themselves with the three generations of Activity Theory, Section 3.2.1 begins with a brief historical background of Activity Theory, followed by illustrations of the first-generation theory (Section 3.2.2) and the second-generation theory (Section 3.2.3). Section 3.2.4 elaborates on the fundamental concepts of the third-generation theory; whereas Section 3.2.5 discusses the rationale for adopting Activity Theory as the primary theoretical framework in this study. Finally, Section 3.2.6 illustrates a new visual model of activity systems developed by this researcher for this study; interacting activity systems with a three-layered learning environment model. The system was developed by integrating the work of Engeström (2001) with a three-layered learning environment to demonstrate interactions of mediation factors in multiple learning

environments; 1) immediate learning environment; 2) external learning environment; and 3) online learning environment.

3.2.1 History of Activity Theory

Kuutti (1997) describes Activity Theory as a "philosophical and cross-disciplinary framework for studying different forms of human practices as development processes, with both individual and social levels interlinked at the same time" (p. 25). As he described, Activity Theory developed from multiple historical and intellectual roots: 18th and 19th century German philosophers such as Kant and Hegel; sociological and economical scholars such as Marx and Engels; and Russian psychologies such as Vygotsky, Luria and Leont'ev (Thorne, 2004). Engeström (2001) labelled Vygotsky's (1978) model the 'first generation' of Activity Theory, and Leont'ev (1978, 1981) 's model as the 'second generation'. Drawing on their intellectual works, Engeström (2001) further extended Activity Theory by developing what he called the 'third generation' of Activity Theory, consisting of two interacting activity systems.

3.2.2 First-Generation Activity Theory

The 'first generation' of Activity Theory developed by Vygotsky (1978) introduce the concept of 'mediation' by developing a triangular model consisting of (auxiliary) Stimulus (S), mediation (X), and Response (R). As Image 3.1 shows, auxiliary stimulus such as a sign does not trigger the direct response, but the stimulus mediates the response. Vygotsky illustrates the mediated act by auxiliary stimulus in the assertion that "it transfers the physiological operation to higher and qualitatively new forms and permit humans, by the aid of extrinsic stimuli, to control their behaver from the outside" (p. 40).

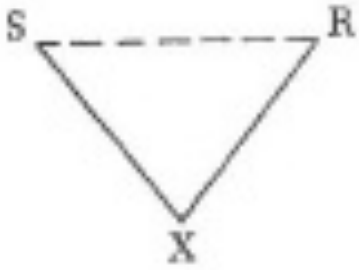


Image 3.1: Vygotsky's triangular model (Vygotsky, 1978, p. 40)

The concept of 'mediation', which Engeström (2001) termed 'mediating artefacts', provides this study with a useful framework to understand how the 'auxiliary stimulus' used by the seven participant pairs impacts the way they engaged in task management and language learning during the project and consequently, the outcomes they achieved in the project. The participants had the opportunity to use a wide range of mediating artefacts to complete their projects including first language/stronger foreign language, online dictionaries, and online collaborative working platforms. The 'mediation' lens allows this study to explain how use of different mediating artifacts encouraged each learner to engage in language learning differently during this project. Although Vygotsky's (1978) model enhanced our understanding of the impact of mediating artefacts on cognitive functions, the limitation of his model is evident in its narrow focus on individual cognitive functions (e.g., Engeström, 2001).

3.2.3 Second-Generation Activity Theory

Leont'ev (1977, 1978, 1981) extended the work of Vygotsky (1978) by the social dimensions of collective activities into Activity Theory. One of Leont'ev's contributions was to distinguish human activities from animal activities; making and using tools particularly to accomplish a collective activity with the community members. Using collective hunting as the example, Leont'ev (1981) illustrated how humans' collective activities are mediated by tools

and division of labour among the community members. Leont'ev (1978, 1981) perceived that all human activities are 'social' regardless of the conditions or the forms of the activities. Leont'ev (1977) asserted the social nature of human activities as below:

> However, no matter what the conditions and forms in which man's activity proceeds, no matter what structure it acquires, it cannot be regarded as something extracted from social relations, from the life of society. Despite all its diversity, all its special features the activity of the human individual is a system that obeys the system of relations of society. Outside these relations human activity does not exist (p. 182).

Engeström (2001) labelled Leont'ev's (1978, 1981) work as the 'second generation' of Activity Theory. Leont'ev (1978, 1981) did not however extend the scope of Vygotsky's triangular model by incorporating these social dimensions into it (Engeström, 2001). Therefore, Engeström (1987) developed the triangular model of 'a human activity system' presented in Image 3.2 by synthesising works of Vygotsky (1978) and Leont'ev (1978, 1981). The upper section of the triangle in Image 3.2 represents the concept of mediation proposed by Vygotsky (1978). As the Figure shows, the relationship between 'subject and object', and stimulus and response in Vygotsky's work are mediated by 'instrument' in Engeström's model. Engeström (1987) included the three social dimensions mediating human collective activities in the lower section of the triangle; namely, rules, community, and division of labour.

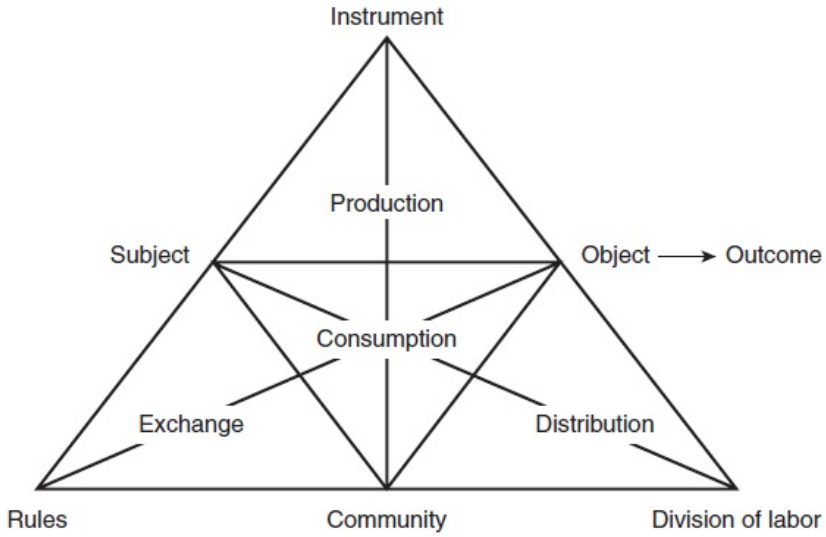


Image 3.2: The structure of a human activity system proposed by Engeström (1987, p.63)

The later work of Engeström (1996, p. 67) provides explicit definitions for the six components comprising a human activity system and the outcome as below:

> **1) Subject**: "the individual or subgroup whose agency is chose as the point of view in the analysis"
>
> **2) Object**: "the 'raw material' or 'problem space' at which the activity is directed"
>
> **3) Instrument/Mediating artefacts[6]:** "physical and symbolic, external and internal tools"
>
> **4) Community**: "multiple individuals and /or subgroups who share the same general object"
>
> **5) Division of labour**: "both the horizontal division of tasks between the members of the community and to the vertical division of power and status"
>
> **6**) **Rules**: "the explicit and implicit regulations, norms and conventions that constrain actions and interactions within the activity system"
>
> **7) Outcome**: outcomes "moulded or transformed [from their objects] with the help of physical and symbolic, external and internal tools"

[6] Engeström used different terms when referring to 'mediating artefacts' in his early works such as 'instrument' (Engeström, 1987), 'tools' (Engeström, 1996), 'mediating artefacts' (Engeström, 1999, 2001). I adopted 'mediating artefacts' to discuss the findings of this study.

Thus, Engeström's (1987, 1996) model provides a useful visual framework to understand how the way in which the individual worked on the activity and the outcomes he or she achieved are mediated by the interactions of the six components in the activity system: 1) subject; 2) object; 3) mediating artefacts; 4) community; 5) division of labour; and 6) rules.

This could be revised to show how the model can be applied to the collaborative digital storytelling projects implemented in this study as below:

> **1) Subject**: 14 learners of Japanese who have learned or are learning Japanese at Australian universities.
>
> **2) Object**: The objects the participants aim to achieve in this project. Although all participants participated in this project to create digital stories in Japanese, each participant also developed their own objects for this project, including Japanese related objects as well as non-Japanese related objects. For example, Japanese related objects could be to improve speaking proficiency in Japanese. Non-Japanese related objects could be to improve video editing skills or to develop ability to express their perspectives using visuals and sounds. The concept of 'objects' helped this study to understand what the participants were doing in this project, and to explain their behaviour (Kaptelinin, 2005).
>
> **3) Mediating artefacts:** The resources used by the participants to manage task procedures and language learning during the project**.** Each participant interprets and uses a wide range of mediating artefacts differently according to their "immediate and historical use (of the artefacts) by communities" (Thorne, 2000, p. 1). In this project, it can be anticipated that the participants may use a wide range of artefacts according to their prior-experiences, perceived usefulness of the artefacts, and abilities to use the artefacts. Artefacts for use to create digital stories and to engage in language learning include mobile phones, laptops, Google Docs, websites, a shared screen, a video-editing software, their peers and Japanese friends.
>
> **4) Community**: The immediate learning environment in which the participants are situated to complete this project, the ones they are situated in outside this project such as their academic communities in other university subjects, or the ones they have previously situated. The interpretation of data analysis focused on identifying practices of communities, how mediating tools were used in their communities, what rules they adhere to follow while working on the project.

> **5) Division of labour**: How the participants divided the tasks and what roles they adopted to complete the project. The interpretation of data focused on how the participants' tasks divisions and roles were mediated by various factors including their abilities to complete their task independently, the practices of the communities in which they are situated, and the availability of artefacts which allow the participants to work on different parts of the task.
>
> **6**) **Rules**: The set of explicit or understood regulations or principles developed by the participants to work on the project. For example, the rules may regulate how the participants are to work in collaboration, how they should engage in language learning, and what they should do to learn the language efficiently.
>
> **7) Outcome**: What each participant achieves in this project "with the help of physical and symbolic, external and internal tools" (Engeström, 1996, p. 67). This study perceives the use of different mediation ranges such as the working platforms adopted and the types of peers interactions may encourage each pair to produce different learning outcomes.

Another contribution of Leont'ev's (1977) work is to provide the insight into the inseparable nature of 'activity' and 'object' in the subject's engagement. According to Leont'ev (1978), the Russian equivalent word for 'activity' means "the object of activity". He therefore called upon further scientific research into 'the objects' derived from people's participation in an activity by stating "objectless activity" is meaningless for the researcher as below:

> The basic, constituent feature of activity is that it has an *object*. In fact, the very concept of activity (doing, *Tätigkeit*) implies the concept of the object of activity. The expression "objectless activity" has no meaning at all. Activity may appear to be objectless, but the scientific investigation of activity necessarily demands the discovery of its object. Moreover, the object of activity appears in two forms: first, in its independent existence, commanding the activity of the subject, and second, as the mental image of the object, as the product of the subject's "detection" of its properties, which is effected by the activity of the subject and cannot be effected otherwise. (p. 182)

For researchers of language learning, the 'object of activity' serves as a useful analytical tool to understand not only what learners are doing but also the "ultimate reason behind various behaviours of individuals, groups, or organizations" (Kaptelinin, 2005, p. 5).

To sum up, the second generation of Activity Theory (Leont'ev, 1978, 1981) expanded the scope of Activity Theory by including social aspects of mediation factors, the communities in which the subjects are or have been situated, and how the subjects divide their tasks. This framework enables this present study to analyse how the participants' engagement in collaborative digital storytelling projects are mediated not only by their individual factors but also socio-historical factors.

3.2.4 Third-Generation Activity Theory

As discussed in Section 3.2.3, the 'second-generation' Activity Theory provides a useful framework to analyse factors mediating a collective human activity by linking both the "individual and social levels" (p. 25) simultaneously (Kuutti, 1997). However, the focus is limited to an analysis of one activity system and the mediating factors. To analyse "dialogue, multiple perspectives, and networking of interacting activity systems" (p. 135), Engeström (2001) developed the third-generation model of Activity Theory, consisting of two or more interacting activity systems (see Image 3.3). As Image 3.3 shows, each activity system in the figure constructs "a collectively meaningful object (Object 2)". However, the multiple activity systems develop "a potentially shared or jointly constructed object" (Object 3) by interacting with each other (Engeström, 2001, p. 136).

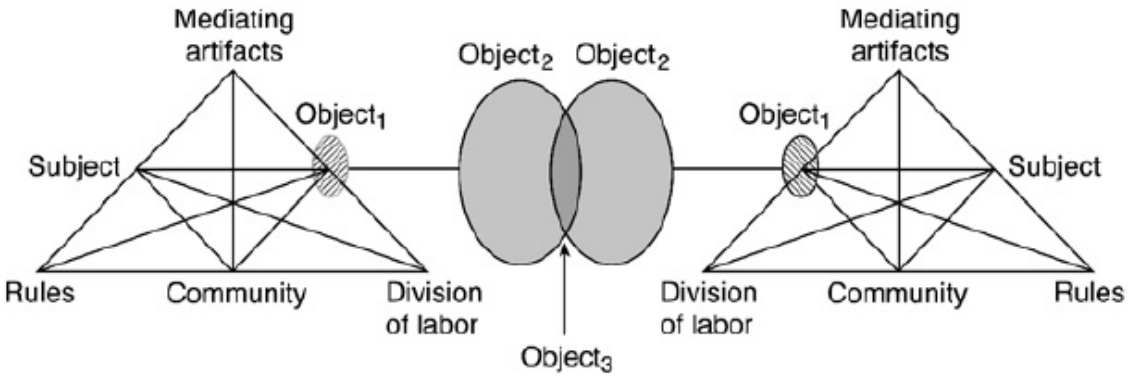


Image 3.3: The third-generation model; two interacting activity systems (Engreström, 2001, p. 136)

For this study, the 'third-generation' model (Engeström, 2001) of Activity Theory was adopted to analyse the task management and language learning processes undertaken by the 14 participants of Japanese language learners during the project. The capability to analyse "dialogue, multiple perspectives, and networking of interacting activity systems" (Engeström, 2001, p. 135) allows this study to examine how two learners in each pair, perceiving them as two interacting activity systems, negotiate their different orientations towards their objects. Specifically, how they negotiate task management and language learning, and how to work on the project with peers of a different background, education level, and with different learning experiences. Hence, the analysis can be broad in scope to include socio-cultural, historical, personal, and contextual perspectives.

Engeström (2001) listed the following five principles of the third-generation Activity Theory as follows (p. 136):

> **1) The prime unit of analysis**
> "[A] collective, artefact-mediated and object-oriented activity system, seen in its network relations to other activity systems, is taken as the prime unit of analysis."
>
> **2) Multiple-voicedness of activity systems**
> "An activity system is always a community of multiple points of view, traditions and interest. The division of labour in an activity creates different position for the participants, the participants carry their own diverse histories, and the activity system its self carries multiple layers and strands of history engraved in its artefacts, rules and congestions."

3) Historicity
"Activity systems take shape and get transformed over lengthy periods of time. Their problems and potentials can only be understood against their own history. History itself needs to be studies as local history of the activity and its objects, and as history to the theoretical ideas and tools that have shaped their activity."

4) Roles of contradictions
"Contradictions are historically accumulating structural tensions within and between activity systems… Such contradictions generate disturbances and conflicts, but also innovative attempts to change the activity."

5) Possibility of expansive transformations in activity system
"Activity systems move through relatively long cycles of qualitative transformation. As the contradictions of an activity system are aggravated, some individual participants begin to question and deviate from its established norms. In some case, this escalates into collaborative envisioning and a deliberate collective change effort."

The first principle listed by Engeström (2001) is to recognise "a collective, artefact-mediated and object-oriented activity system" as "the prime unit of analysis". Applying the first principle to this study, the two learners of Japanese working as a pair to produce a digital story in Japanese are identified as "the prime unit of analysis".

The second principle of the third-generation Activity Theory is "[m]ultiple-voicedness of activity systems". Engeström (2001) asserts "[a]ctivity system is always a community of multiple points of views, traditions and interest" (p. 136). In this long-term collaborative project, the second principle is reflected in the dynamic whereby participants work with a peer from a different background, level of education, and with different learning experiences. However, to complete the projects in a way that is satisfactory to both participants, they must negotiate the differences in their orientations such as their objects of the project, the types of mediating artefacts they use in the project, the rules attached to the project, and the ways in which to divide the tasks and roles. The "multiple-voicedness of activity systems" (p. 136) are explored in this study by carefully watching the interactions of the pair participants during the

formal research sessions and video recordings, and by eliciting their "multiple-voicedness" by conducting semi-structured interviews and stimulated recall sessions.

The third principle proposed by Engeström (2001) is the "historicity" of activity systems. Engeström (2001) asserted that "[t]heir problems and potentials can only be understood against their own history" (p. 136). In this study, the participants' prior experiences as learners can mediate how they work on the project and engage in learning Japanese. To understand the impact of "historicity" on their working and learning practices, I will elicit from the participants during semi-structured interviews relevant historical information including their cultural background, level of education, prior experiences of collaborative learning projects, preferred learning styles, belief about language learning, and prior experiences using technologies for language learning. The results of the data analysis related to the participants' task management and language learning processes will then be analysed in relation to the aforementioned historical information provided by each participant.

The fourth principle provided by Engeström (2001) is "the central role of contradictions as sources of changes and development" (p. 137). Contradictions are developed due to "historically accumulating structural tensions within and between activity systems" (p. 137). For Engeström (2001), developing contradictions is not necessarily a negative outcome. He asserted that "[s]uch contradictions generate disturbances and conflicts, but also innovative attempts to change the activities. Applying the concept of 'contradictions' to this study, I will identify and analyse the contradictions inhibiting the participants ability to work with a peer or to engage in learning Japanese efficiently during this project.

In prior works, Engeström proposed the following four levels of 'contractions';

> **1) Inner contradictions**: Contradictions which occur within the activity system due to "tension between the use value and the exchange value" (Engeström, 1996, p.72);
>
> **2) Secondary contradictions**: Contradictions which appear between components of different connected activity systems. This type of contradiction occurs when "a strong novel factor is 'injected' into one of the components and it thus acquires a new quality" (Engeström, 1996, p. 72);
>
> **3) The tertiary contradiction**: Contradictions which occur "when representatives of culture (e.g. teachers) introduce the object and motive of a culturally more advanced form of the central activity into their dominant form of the central activity" (Engeström, 1987, p.70);
>
> **4) The quaternary contradictions**: Contradictions which occur when the essential 'neighbour activities' linked with the central activity which is the original object of our study" (Engeström, 1987, p. 72).

This study explores the different levels of contradictions the participants encounter during the project by carefully analysing the video-recordings of the formal research session activities and the participants' semi-structured interviews.

The fifth principle of Activity Theory is "the possibility of expansive transformations in activity systems" (p. 137). According to Engeström (2001), some participants may "begin to question and deviate from its established norms" as "the contradictions of an activity systems are aggravated" (p. 137). Situating the concept in this study, some participants may adjust how they work on the project with their pair partner or engage in language learning by using alternative ways to mitigate the contradictions to realise their objects. By analysing the video-recordings of the research session activities and the participants' semi-structured interviews, this study shows how learners who encountered contradictions exercised their agency as learners to reconstruct their working and learning environment.

3.2.5 Rationale of adopting Activity Theory in this study

The study adopted Activity Theory as the theoretical framework to guide data analysis and discussion in this thesis. The lens of Activity Theory provides a useful framework to analyse the process of task management and language learning the seven pairs of Japanese language learners engaged in during this long-term project by linking both "individual and social levels" at the same time (Kuutti, 1997, p.25). In particular, Activity Theory can illuminate "orientations toward the activity at hand, and the varying roles that participants and artefacts play, without the blind spots that teacher, student, and technology-centred approaches tend to produce" (Thorne, 2004, p. 52-53). Thorne (2004) asserted the strength of using Activity Theory as a theoretical framework as 'its inherent dialectical sensitivity to the inventiveness of human activity and the normalizing pressures of expected forms of behaviour" (Thorne, 2004, p. 53). Thus, adopting Activity Theory as a theoretical framework provides this study perspectives to understand how the participants' management of their task procedures and language learning during this project is mediated by multiple factors from a broader perspective; individual, contextual, historical and socio-cultural perspectives. The concept of 'contradictions' also shows how the participants restructure their working and learning environment in order to mitigate contradictions they have encountered in this project by exercising their agency as a learner.

3.2.6 Interacting activity systems with a three-layered learning environment model

As discussed in Section 3.2.5, Engeström's (2001) triangular model consisting of two interacting activity systems provide a useful visual framework to present interactions of two or more activity systems consisting of different components, contradictions, and their process of negotiations to develop "a potentially shared or jointly constructed object" (Engeström, 2001, p. 136). However, in terms of this study, the limitation of the model is its lack of

capability to indicate the multiple mediating factors of this project which exist in different levels of learning environments and the interactions of the multiple factors in multiple learning environments mediating two or multiple activity systems. Figure 3.1 shows a three-layered learning environment model which this study developed to overcome the limitations by integrating Engeström's (2001) model with a three-layered learning environment; 1) immediate learning environment; 2) external learning environment; and 3) online learning environment.

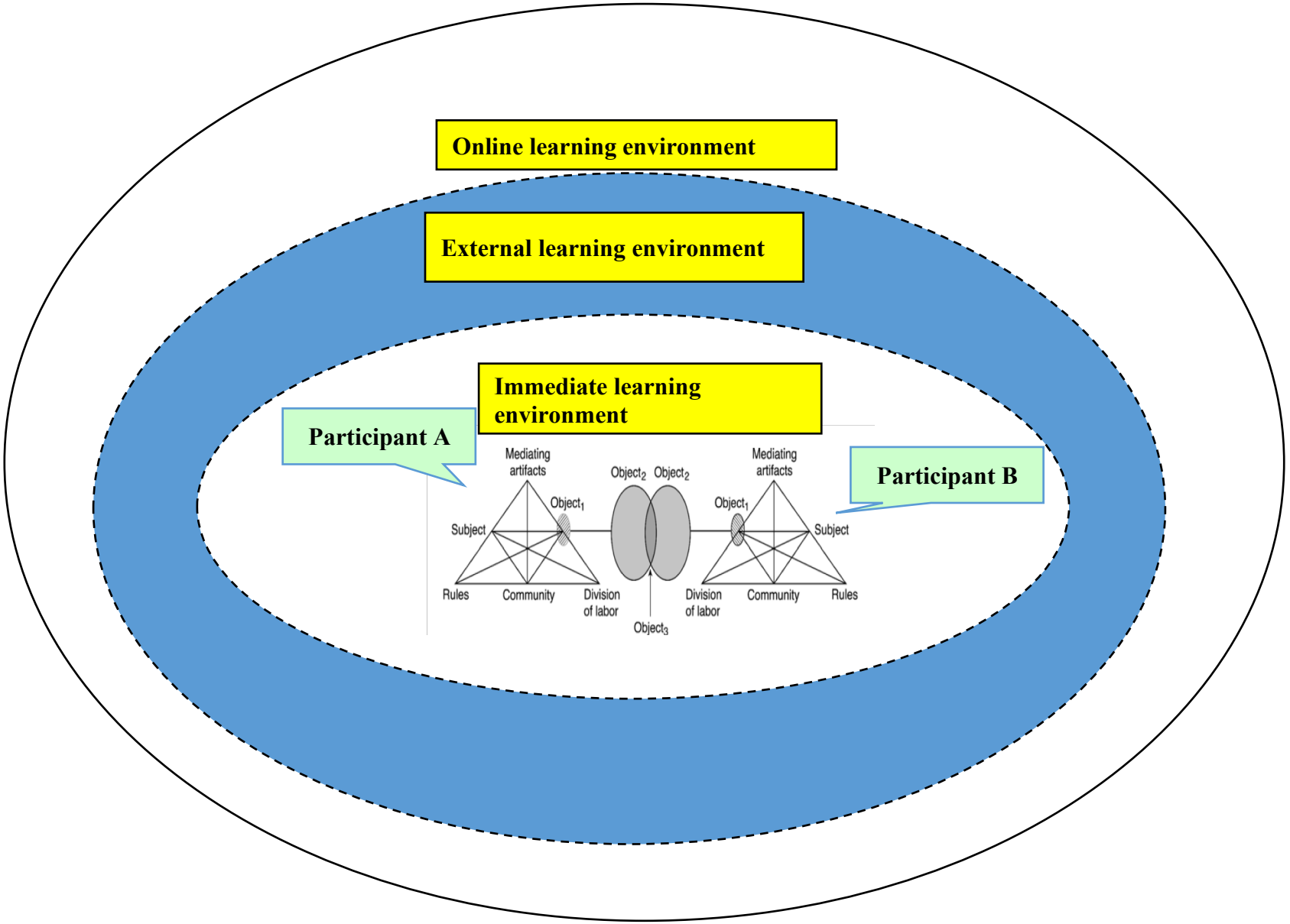


Figure 3.1: Interacting activity systems with a three-layered learning environment model

This three-layered learning environment model is developed to visualise how multiple factors in different learning environments impact how each pair engage in language learning during collaborative digital storytelling projects. The development of the new model was based on an assumption that various factors in multiple levels of the learning environment mediate how the participants engage in language learning during the project. This is regarding not only the immediate learning environment the participants work in with their peers, but also the external learning environments such as their prior experiences of collaborative projects at other university subjects and the online learning environment provided by their laptops and mobile phones.

The innermost circle in Figure 3.1 shows the immediate learning environment where the participants are situated for this project. The colored circle in the middle indicates the external learning environment directly outside the immediate learning context (i.e. the broader context: institution and society). The outermost circle presents the online learning environment which they used for learning such as relevant websites and online dictionaries.

The two triangles in Figure 3.1 represent the activity systems of the two participants in a pair. The triangle on the left shows the activity system of Participant A; whereas the triangle on the right shows the activity system of Participant B. The model consists of two or more interacting activity systems surrounded by three layers of learning environment; 1) immediate learning environment; 2) external learning environment; and 3) online learning environment.

The characteristics of each participants' activity system is described according to the following six components: 1) subjects; 2) mediating artefacts; 3) objects; 4) division of labor; 5) community; and 6) rules. The six components of each learner's activity system may include similar, different, or contradicting characteristics. For example, Participant A developed a rule that a language learner should write compositions individually due to prior experiences to complete group projects by writing different lines using Google Docs; whereas, Participant B

developed the contradictory rule that a language learner should discuss and write with another language learner due to prior experiences of collaborative writing with peers in Japanese class in his or her university. In this case, the activity systems of the two participants show 'secondary contradictions' in their rules; writing individually vs discussing and writing together. However, they may develop partly shared objectives by interacting with each other.

Figure 3.2 shows an example drawn to demonstrate the above discussed analytical procedures. A triangle in left shows the activity system of Participant A, whereas the one in right shows the activity system of Participant B. The rules the participants developed for this project are indicated within the 'immediate learning environment' as the rules were used to work on the project. For example, Participant B developed a rule to discuss and write their script together due to her prior experiences to complete group assignments for Japanese class by discussing and writing together with peers. This factor is indicated within the external learning environment of this project as the Japanese classes take place in the external learning environment of this project (see Figure 3.2). Participant A wanted to use Google Docs for this project due to his perceived benefits of using Google Docs for collaborative writing. The learner's perceived benefit of using online resources is indicated inside the 'online learning environment' as using online resources for language learning occurring in an online learning environment (see Figure 3.2). The learner has completed group projects in his major by dividing his tasks to each member. Based on the prior experience, he developed a rule to complete the writing by writing different lines using Google Docs. This factor is indicated by overlapping the 'external learning environment' and 'online learning environment' experienced by the learner during the group project (see Figure 3.2). Comparison of Participant A and B's activity systems revealed a secondary contradiction in their activity systems; rules of writing compositions individually vs rules of writing compositions together.

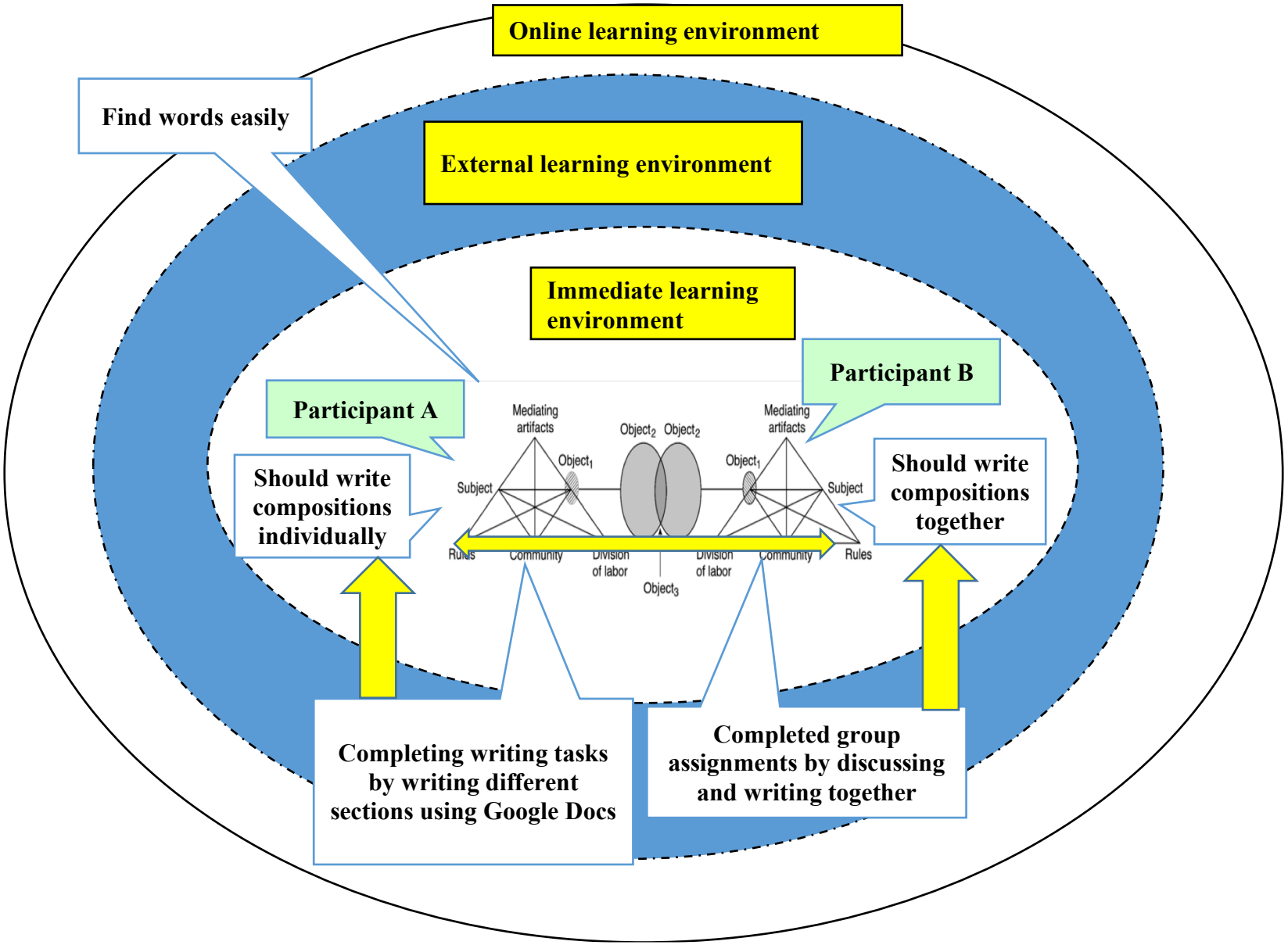


Figure 3.2: An example of two interacting activity systems developed by Participants A and B

3.3 Definition of Collaborative Dialogue

Swain (2000) defined 'collaborative dialogue' as "dialogue in which speakers are engaged in problem solving and knowledge building. It heightens the potential for explanation of the product… collaborative dialogue mediates joint problem solving and knowledge construction" (p. 102). The author developed the concept drawing on sociocultural works by Stetsendko and Arievitch (1997), Vygotsky (1978, 1981), and Wells (2000). Psychological processes first occur in interactions with others, which the learner internalises using semiotic tools such as language. Swain (2000) states that "their knowledge building [is] mediated by language – by a dialogue in which they [draw] attention to problems and verbalized alternative solutions" (p. 104). She asserted that the linguistic knowledge learners construct in collaborative dialogue with peers may provide "a tool for their further individual use of their second language" (p. 104).

Thus, 'collaborative dialogue' serves as a 'mediating tool' in the language learner's process of learning the target language. As such, the concept also serves as 'a useful analytical framework' for researchers to understand the role of dialogue among peers during language learning and the role of target language knowledge construction process during dialogue by peers. To operationalize the concept of learning in collaborative dialogue, Swain and Lapkin (1995, 1998, 2001, 2002) proposed 'Language-Related Episodes (LREs'). Section 4.6.4 provides the definition and the sub-coding categories, whereas the in-depth analytical procedures will be discussed in Section 5.1.1,

3.4 Definitions of Resources

Palfreyman (2006) defines 'resources' as the objects "facilitating learning outside the classroom" (p. 354). The author further defined resources as "the whole range of affordances which are accessed and drawn upon by learners as resources of various kinds" (Palfreyman, 2014, p. 178). Palfreyman developed the concept of resources from an ecological perspective; namely, the environment in which the learners are situated provides a wide range of affordances they can use for language learning, but what they actually use for language learning is determined by: 1) "the features of their task context"; 2) "learning skills"; and 3) "attitudinal/affective variables" (p. 178). In other words, task contexts which require learners to use only their own linguistic resources may discourage learners with expert knowledge of resource use for language learning from applying their knowledge to enhance language learning during a project. Even if the the learning environment provides a wide range of learning resources, learners who cannot perceive the usefulness of the resources or who lack the ability to use them for language learning may not use the resources to expand their opportunities for language learning.

Palfreyman (2006, 2014) proposed three types of resources that learners use to engage in language learning outside the classroom: 1) material resources; 2) social resources; and 3) discursive resources. Material resources refer to not only the 'hardware' learners use to facilitate language learning such as textbooks, but also the 'software' the learners use such as "a target language television channel" and "information for language learning" (Palfreyman, 2006, p. 356). Notably, Palfreyman (2006) stressed that teachers and learners may "interpret and use these resources differently" (p. 356). For example, some participants may perceive 'Windows Movie Maker' as only a video editing software; whereas some participants may perceive it as a material resource allowing them to detect language problems they need to improve.

Social resources refers to the network of other people the learners use as models for learning and as a "source of support and feedback" (Palfreyman, 2006, p. 356). The participants in this study may use their existing social network of Japanese friends as a resource to achieve various learning processes related to the project include receiving feedback on their writing. Finally, discursive resources refer to the discourse "in the local society which forbid or legitimize" the use of the resources for language learning (Palfreyman, 2014, p.179). In this research context, discursive resources can refer to discourses prohibiting or permitting the participants to use external resources other than their own linguistic knowledge, including online resources and their existing social network of Japanese friends. This study applied the concepts of material resources, social resources, and discursive resources particularly to analyse how the participants engage in language learning by using alternative resources other than their linguistic knowledge both inside and outside collaborative dialogues. An application of the concept for this study will be discussed at Section 4.6.5, whereas the in-depth analytical procedures will be provided at Section 7.1.1.

3.5 Conclusion

This chapter introduced and discussed the theoretical framework and concepts applied in this study. Section 3.2 described the fundamental concepts of Activity Theory, followed by the an explanation of how these concepts were applied in this study to analyse how mediating factors impact on task management and language learning by the seven pairs of Japanese language learners. Section 3.3 reviewed the concepts of collaborative dialogue, the operationalised concept, and LREs. The way in which the participant pairs' interactions for language learning were analysed was then explained. Finally, Section 3.4 elaborated on the concept of resources, and described how the concept allowed this research investigation to

identify the ways in which the participants used alternative resources other than their linguistic knowledge to enhance their language learning during the project.

Figure 3.3 presents the structure of each chapter reporting the study findings, theoretical framework, and the concepts used in each chapter. It indicates that Chapter 5 adopted 'task and role allocation' (discussed in Section 5.1.1 in Chapter 5), TMEs and LREs to identify the patterns of peer interactions developed by the seven pairs during this long-term collaborative learning project. Chapter 6 extensively used the concept of LREs to compare the quantity and quality of the language learning by the participants, focusing particularly on their use of their own linguistic knowledge in collaborative dialogue. Chapter 7 adopted concepts of LREs and resources to analyse the language learning undertaken by the seven pairs in two learning contexts: 1) language learning in collaborative dialogue; and 2) language learning outside of collaborative dialogue. To examine language learning in the former learning context, both LREs and the resources concept were applied. In contrast, only the concept of resources was used to analyse language learning in the latter learning contexts. Chapter 8 used Activity Theory, the concept of 'contradictions', and interacting activity systems with a three-layered learning environment model to discuss factors mediating the participants' language learning. The next chapter presents the research mythologies including the research design, background of the project and the participants, types of data sets collected, and the data analysis procedures.

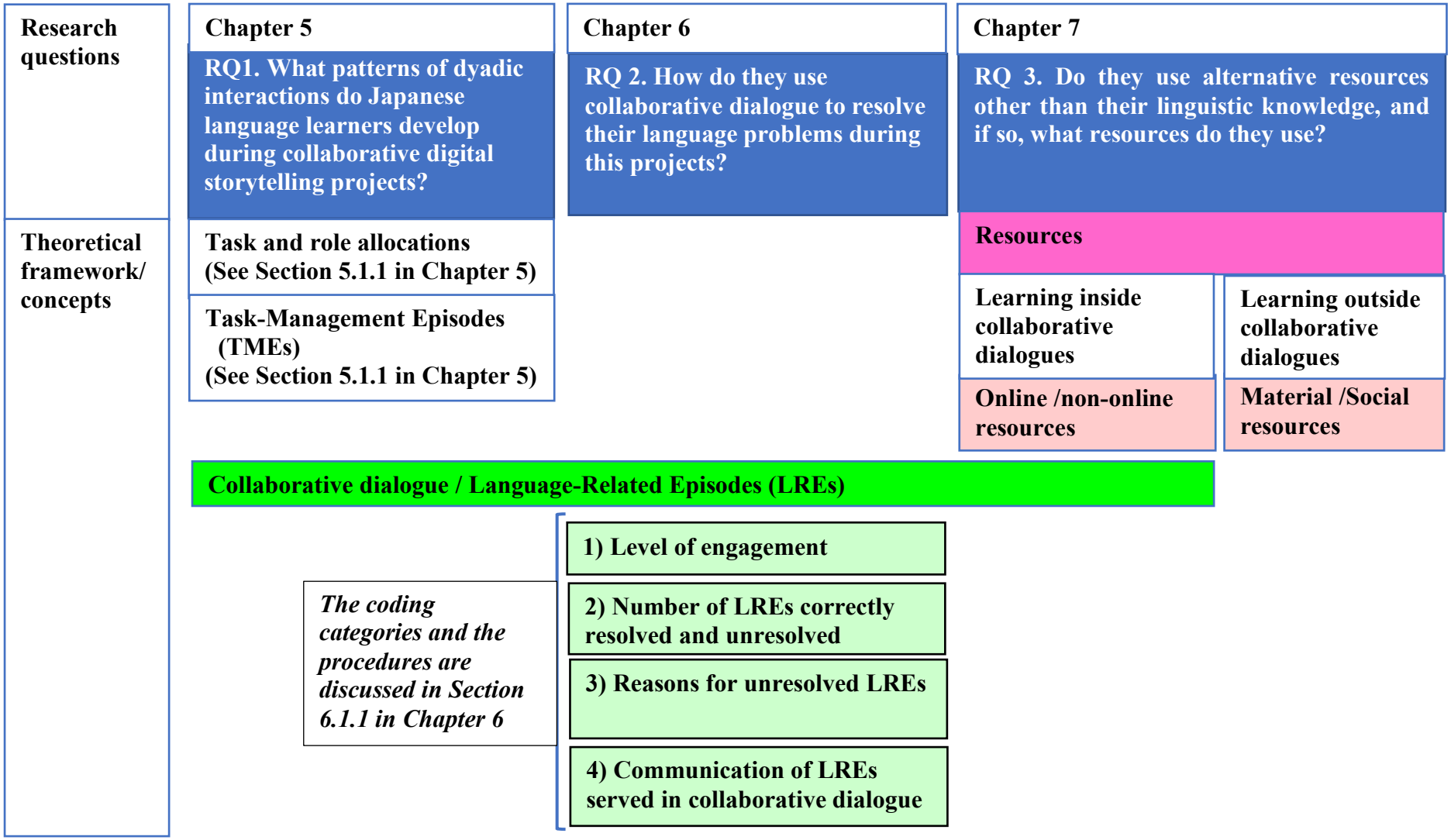


Figure 3.3 (Part 1): Structure of this thesis, and theoretical framework/concepts used in each chapter

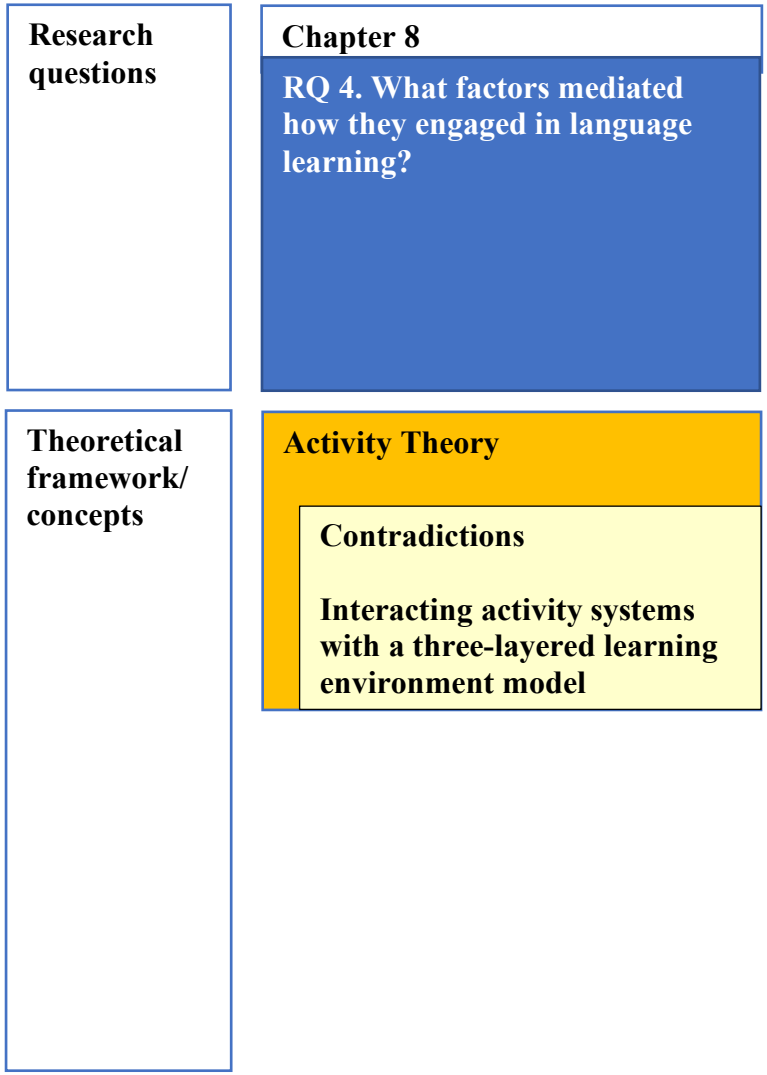


Figure 3.3 (Part 2): Structure of this thesis, and theoretical framework/concepts used in each chapter

Chapter 4

Research Methodology

4.1 Introduction

This chapter describes the methodology employed in this study to examine language learning by seven pairs of Japanese language learners during collaborative digital storytelling projects conducted at Australian universities. The specific research questions are:

RQ 1. What patterns of dyadic interactions do Japanese language learners develop during collaborative digital storytelling projects?

RQ2. How do they use collaborative dialogue to resolve their language problems during this projects?

RQ 3. Do they use alternative resources other than their linguistic knowledge, and if so, what resources do they use?

RQ 4. What factors mediate how they engaged in language learning?

To address these research questions, this study adopted a 'design-based research' approach (Barab & Squire, 2004; Wang & Hannafin, 2005). This chapter begins with a description of 'design-based research' (Section 4.2). Section 4.3 illustrates the three-step procedure to conduct design-based research. Section 4.4 elaborates the project design and background of the 14 participants. Section 4.5 discusses how the data was collected for this study, followed by a description of the data analysis procedures (Section 4.6). In Section 4.7, the effort undertaken to enhance the trustworthiness of this study is addressed by describing the triangulation procedures employed and the reasons for provided thick descriptions. Section

4.8 describes how this study meets the ethics responsibilities of a researcher. This chapter concludes with a summary of the overall structure of this thesis.

4.2 Research design and rationale

This study adopted 'design-based research' to examine the process of language learning demonstrated by 14 learners of Japanese while completing a collaborative digital storytelling project. This research methodology is described with different terminologies; 'experimental designs' (Brown, 1992), 'design experiments' (Cobb et al., 2003), and 'design-based research' (Barab & Squire, 2004; Wang & Hannafin, 2005). Design-based research was initially proposed by Ann Brown (1992) as "experimental designs" (pp. 141-144). The reason for conducting this type of research is to identify an effective pedagogical intervention. The author asserted that the intervention "should be able to migrate from our experimental classroom to average classrooms operated by and for average students and teachers, supported by realistic technological and personal support" (p. 145). Wang and Hannafin (2005) defined design-based research as below:

> [A] systematic but flexible methodology aimed to improve educational practices through iterative analysis, design, development, and implementation, based on collaboration among researchers and practitioners in real-world settings, and leading to contextually-sensitive design principles and theories.
>
> (Wang & Hannafin, 2005, p. 6-7)

The design and aim of 'design-based research' are congruent to this present study: to examine the learning that occurs in contexts which are "designed and systematically changed by the researcher" (Barab & Squire, 2004, p. 2). Congruent to the design principle, the focus of this study is to examine language learning during collaborative digital storytelling projects designed specifically to promote learning of language and culture by interacting with peers and

Japanese native speakers. Design-based research is also appropriate for this research context because the study is designed as "test-beds for innovation" (Cobb et al., 2003). Conducting this study by adopting design-based research allows me to design an innovative pedagogy (collective digital storytelling projects), to test the effectiveness of the pedagogy by conducting experiments with language learners, and to redesign the pedagogy to enhance language learning in the project based on the results.

Given that two of the research sites at which this study was conducted have adopted digital storytelling projects in their curricular, this study could have been conducted "in real-world settings" as many design-based researches examine learning in "in real-world settings" (Wang & Hannafin, 2005, p. 6-7). However, the choice was made to conduct this study outside of real classrooms due to the greater advantages. First, the 'quasi-real-world settings' allow me to implement the projects with consistent research design regardless of existing curricular at the research sites. In addition, conducting this study in a 'quasi-real-world setting' reduces the risk of classroom-based distraction for learners and data can be collected outside real-world classrooms.

4.3 Conducting design-based research

This section describes the three-step procedure of design-based research implemented in this study: 1) preparing a design experiment; 2) conducting the design experiment; and 3) conducting the retrospective analysis (Cobb et al., 2003; Cobb & Gravemeijer, 2008; Reimann, 2011). Table 4.1 summarises the three-step procedure:

Table 4.1: Design-based research procedure

	Research activities suggested by other scholars	**Research activities the researcher has conducted**
Phase 1: **Preparing a design experiment**	Specify research goals and instructions (Cobb et al., 2003)	1) Developed project instruction goals by synthesising reflection of my instructional experiences and literature reviews. 2) Developed research questions based on the research gaps identified by conducting literature reviews. 3) Developed the project design, created the instruction materials. 4) Planned how to conduct the experiment. 5) Obtained permission from Macquarie University to conduct this research. 6) Obtained permissions to recruit participants at three research sites.
Phase 2: Conducting a design experiment	Collect data, test and revise the conjectures to improve the initial innovation design to enhance student learning (Cobb et al., 2003)	1) Conducted first experiments with five pairs in Semester 1, 2016. Data collected and analyse. 2) Revised the experiment design based on analysis of the first experiments to enhance language learning during the projects. 3) Conducted the second experiments with two pairs in Semester 2, 2016 based on the revised experimental design.
Phase 3: Conducting retrospective analysis	Situate the experiment design in a broader theoretical context (Cobb et al., 2003). Address methodological issues such as trustworthiness, generalisability of findings, and the repeatability of the design (Reimann, 2011).	1) Supported triangulation in data collection: a) multiple sources of data; b) multiple types of data; and c) seven pairs with diverse backgrounds. 2) Analysed data and discussed findings based on theoretical perspectives. 3) Provided detailed accounts of research procedures and addressed how I have responded with methodical critics of design-based studies.

4.3.1 Phase 1 (Preparing a design experiment)

The procedures conducted in Phase 1 were to specify the goals of this study, develop and provide the pedagogical instructions to participants, and situate this study in a theoretical framework (Cobb et al., 2003). As per the guideline, scholars have suggested to conduct literature reviews, analyse curricular documents in depth, interview students, or undertake a whole class analysis using video-recordings (Cob & Gravemeijer, 2008; Reimann, 2011; Roschelle et al., 2010).

To develop the research goals and instructions for the projects, I first conducted a literature review (See Chapter 2). I then reflected on my prior teaching experiences while implementing similar projects at a two-year technical college in South Korea from 2010-2014 (Nishioka, 2012, 2014a, 2014b, 2016). Reflection of my previous experiences reminded me of the previous ineffective learning behaviours engaged in by the students: 1) editing video clips without writing a scrip; 2) creating digital stories without recorded narration; and 3) constructing multimodal texts without analysing the effects critically. After synthesising the results of the literature review and my reflection on prior project experiences, the following instruction goals for this project were developed: 1) to write a Japanese script with peers before editing a video clip; 2) to create a three to five-minute digital story with Japanese script; and 3) to craft a multimodal text by critically analysing the effects[7].

[7] As the focus of this thesis is to examine language learning in collaborative digital storytelling projects, it does not discuss the findings on how the participants constructed knowledge to express their meanings using a multimodal text with peers.

Once the instructions were finalise, a detailed plan of the experiment and instruction materials required for the projects was developed (see Section 4.4.1). In addition, the literature review allowed me to locate the research gaps, develop the research questions, and identify a theoretical framework to adopt (see Chapter 3). Finally, a detailed plan for the research procedures was developed, and an ethics application was submitted to Macquarie University to obtain permission to conduct the research projects.

4.3.2 Phase 2 (Conducting a design experiment)

Phase 2 of design-based research is a stage in which researchers the conduct research experiments they have designed. This stage involves a cyclical process of collecting data, testing, and revising the conjectures to improve the initial design innovation to enhance student learning (Cobb et al., 2003). During this stage, it is important to collect data from a wide range of sources to obtain a broad perspective on the phenomenon (Cob et al., 2003). Reimann (2011) also suggested that researchers record both the learning process undertaken by the learners during the experiment and also the learning process of the research team. To understand the diversity of learning experiences during this project, data was collected from seven pairs of students with different backgrounds using multiple data collection methods (see Section 4.5). Shortly after each data collection, brief research memos were written including my reflection on the data collection procedure, brief interpretations of the data, and my decision for the next data-collection phase.

A merit of design-based research is that it enables the researcher to develop an understanding of "the phenomenon under investigation while the experiment is in progress" (Cobb et al., 2003, p. 12). While conducting initial experiments with five pairs in Semester 1, 2016, I realised that four out of five pairs engaged in very few collaborative dialogue interactions to learn Japanese. On the other hand, I also witnessed that some participants expanded their opportunities for language learning in this project by strategically using existing social networks with Japanese friends or an online community for language learners. Realising the pedagogical benefits of adopting their strategies, the experimental design was modified for Phase 2 (Semester 2, 2016); requiring the participants to: 1) interview Japanese and create digital stories in Japanese speakers based on what the participants have learned from the interviews; and 2) receive Japanese spekers' feedback on their script from a Japanese person.

4.3.3 Phase 3 (Conducting retrospective analysis)

The primary goal of conducting retrospective analysis is to situate "the experiment design in a broader theoretical context" (Cobb et al., 2003, p. 13). To achieve this goal, Reimann (2011) recommends that design-based research studies address methodological issues such as "trustworthiness", "generalisability of findings", and "the repeatability of the design" (p. 42). The strategies to enhance trustworthiness in this study included the analysis of multiple types of data collected from multiple participants. This approach helped me to interpret my data from both an "emic perspective" (participants' perspectives) and an "etic perspective" (researcher's perspective) (Drew et al., 2008, p. 188). An effort was also made to provide thick descriptions of the research procedures and findings to help potential readers: 1) judge the extent to which

my findings are applicable to their teaching or research contexts; and 2) help other educators or researchers implement similar projects in their contexts (see Section 4.7).

4.4 The project

This section discusses the contexts in which this study was conducted in the following order: 1) research sites (Section 4.4.1); 2) the participants (Section 4.4.2); and 3) the project design (Section 4.4.3).

4.4.1 Research sites

This study was conducted at three Australian universities outside their regular Japanese language programs for a research purpose. Australian universities including the three research sites provide a wide range of options for language learning; as a major, one of dual majors, and elective subjects. Table 4.2 summarised characteristics of Japanese language programs offered at the research sites and the participants from each university.

Table 4.2: Summary of research sites

	University A	**University B**	**University C**
Japanese programs	University A offers Japanese language programs either as a major, one of dual majors, or elective subjects.	University B also provides Japanese programs either as a major, one of dual majors, or elective subjects.	1) University C provides Japanese programs as as a part of International Studies. The students can enroll in the program either as a major, one of dual majors, or elective subjects. 2) Students majoring in International Studies need to participate in a one-year study program held in a university where their target language is spoken as a official language.
Digital storytelling projects		A digital storytelling project (a video project) is integrated as a part of their Japanese program.	A digital storytelling project (a video project) is integrated as a part of their Japanese program.
Participants	Pair 1 (Tessie/Yujin)	Pair 2 (Kasumi/Sky) Pair 6 (Jiyoung/Walter)	Pair 3 (Sherry/Stephanie) Pair 4 (Brian/Po) Pair 5 (Lucie/Yuki) Pair 7 (Rena/Rita[8])

[8] Rena, a student of University C, invited her younger sister who has studied Japanese in another Australian University to participate in this study.

As seen in Table 4.2, University A and B provide Japanese programs either as a major or elective subject. Japanese programs in University C are offered either as compulsory subjects for International Studies major students who chose to specialise in Japanese or as elective subjects. The study recruited the largest number of volunteer participants (n=7) from University C. This is partly because the participants from University C were expected to particiate in a one-year study abroad program in Japan to obtain their degree (Sherry/Stephanie, Brian/Po, Rena). Lucie and Yuki, have completed the one-year study program in Japan, were motivated to maintain their Japanese by participating in this project. Prior to this project, University B and C had implemented digital storytelling projects (Video projects) as a part of their curricular. Stephanie, a student of University C, completed a video project in Japanese language class during this study. Details of the participants will be discussed in Section 4.4.2.

To conduct this study at the three research sites, the researcher first contacted lecturers who had taught Japanese programs at the research sites to request that she/he introduce my project to their learners. The lecturers who agreed to the recruitment procedure announced the project either to their students directly or via the learning management platform used by the university. The lecturers helped to distribute recruitment advertisements for this project (Appendix 3). The potential participants for this study; namely, those who were interested in participating in this project, contacted me via e-mail. I explained the project goals and their expected roles in the project. The students who made the decisions to participate in this study were then asked to sign Consent Form 1 for this project (Appendix 4). After I revised the participants' data usage (See Section 4.8), I also obtained their consent to the modification by requesting them to sign Consent Form 2 (Appendix 5). This project was conducted outside the classroom settings for research purposes. Therefore, participation in this study did not affect the participants' academic grades. Data collection was conducted at group study rooms at the participants' home universities.

4.4.2 Participants Creating digital stories in Japanese required the participants to use relatively high-level Japanese language. In addition, this study required them to commit themselves to the project for up to six weeks to produce a digital story with peers. Therefore, participants were recruited for this study if they met the following criteria:

1) intermediate or advanced learners of Japanese;
2) interested in making digital stories in Japanese;
3) willing to participate in the study over six weeks; and
4) available at the same time slot with their potential peer every week.

Applying the aforementioned criteria, seven pairs of university students enrolled in Japanese programs at Australian universities[9] were recruited. The Japanese proficiency levels of the participants varied from low intermediate learners who had completed only one year of the Japanese program at their university to advanced learners who had studied Japanese for six years at high school and university including participating in exchange programs with Japanese high schools or universities[10]. Both Australian born students, immigrants and international students were recruited for this study as all research sites host many non-Australian born students. The participants chose to work with either a self-invited peer or the peer I paired up for them. For the participants who did not have a peer to invite, the arranged pairing was primarily based on their timetable. Brief background information on the seven pairs is provided because it is essential to understand the patterns of interactions they developed and their engagement in language learning during this project (discussed Chapter 5-8).

[9] Pair 5 (Lucy/Yuki), 6th year students, obtained enough credits for the Japanese language course. Therefore, they had not attended any Japanese language classes at the time of data collection. As Walter (Pair 6) had completed an advanced Japanese language course at high school, he obtained an exemption from the introductory-level Japanese subject at his university. He had not enrolled in any Japanese language course during data collection.
[10] Some students had not sat the Japanese Language Proficiency Test (JLPT). Therefore, I judged their proficiency level by comparing their test results, time spent learning Japanese, and their writing and speaking performances during this project.

Pair 1: Tessie and Yujin

Pair 1 consists of two Chinese international students, Tessie and Yujin. They participated in Phase 1 of my PhD project (Semester 1, 2016). Table 4.3 shows a brief profile of Pair 1 (Tessie/Yujin):

Table 4.3: Profile of Pair 1 (Tessie/Yujin)

Pair no.	Name Gender	Nationality	Major	Year	Japanese proficiency	Relation to peer
1	Tessie (Female)	Chinese	Double major in Finance / Japanese	2nd year	Low-intermediate Studied Japanese for one year at university	Classmate in Japanese class
	Yujin (Female)	Chinese	Double major in Marketing / Management	3rd year	Intermediate Studied Japanese for one year at university	Classmate in Japanese class

The pair met as classmates in a Japanese language subject at their university one year ago. At the time of data collection, they were in their second year as classmate in the Japanese subject. They have known each other as classmates for over one year, but they were still just developing a friendship. Tessie decided to participate in this study in response to an invitation from Yujin. Although they have studied Japanese in the same program for over one year, Yujin has developed higher Japanese proficiency than Tessie due to her prior exposure to Japanese by watching Japanese anime and visiting Japan with family several times. This project was the first time for them to create a video clip using video editing software.

Pair 2: Kasumi and Sky

Pair 2 consists of two migrants, Kasumi and Sky. Both migrated to Australia when they were teenagers; Kasumi immigrated from England in 2008, and Sky immigrated from Thailand in 2006. They participated in Phase 1 of my PhD study in Semester 1, 2016. Table 4.4 provides a brief summary of their demographic data:

Table 4.4: Profile of Pair 2 (Kasumi/Sky)

Pair no.	Name (Gender)	Nationality	Major	Year	Japanese proficiency	Relation to peer
2	Sky (Male)	Australian (An immigrant from Thailand)	Interactivity and Games	3rd year	Intermediate Studied Japanese for two years at university	Classmate in Japanese class
	Kasumi (Female)	Australian (An immigrant from England)	Japanese Studies	3rd year	Intermediate Studied Japanese for two years at university Participated in a semester exchange program with a Japanese university	Classmate in Japanese class

Although Kasumi and Sky were recruited for this project separately, they were classmates in a Japanese class at university at the time of data collection. I matched them as a pair due to their similar language proficiency level and their compatible timetable. Both are active digital creators in their leisure time. Kasumi aspires to work in the music industry and she actively uploads songs and music videos produced in English online. Sky is a passionate online game player and has an ambition to work for the game industry. To share "the funny moment of the game" with his audience online, he uploaded video clips he recorded while playing online games with friends.

Pair 3: Sherry and Stephanie

Pair 3 consists of two Australian-born students, Sherry and Stephanie. They were the participants in Phase 1 (Semester 1, 2016) of my PhD project. A brief summary of their background information is provided in Table 4.5:

Table 4.5: Profile of Pair 3 (Sherry/Stephanie)

Pair no.	Name (Gender)	Nationality	Major	Year	Japanese proficiency	Relation to peer
3	Sherry (Female)	Australian	Double major in Visual Communication / International Studies	2nd year	Advanced Studied for five years in high school Participated in a two-week language program in Japan	Strangers
	Stephanie (Female)	Australian	Double major in Japanese / Social Inquiry	3rd year	Low-intermediate Studied Japanese for one year at university	Strangers

Sherry and Stephanie met for the first time during this project. They were paired up despite the large Japanese language proficiency gap between them due to their compatible timetable. Sherry has advanced-level Japanese due to five years of Japanese language learning experience at high school. Both learners have extensive experience in creating digital content. Sherry uploads her visual arts work to share with an online audience during her leisure time. Stephanie has worked for a NGO as a part-timer and has engaged in tasks to promote their activities via Social Network Sites (SNSs), blog forums and video clips.

Pair 4: Brian and Po

Pair 4 consists of two male students, Brian and Po. Brian is an Australian-born student; whereas Po migrated to Australia after completing high school in Taiwan. The pair participated in Phase 2 of my PhD study (Semester 2, 2016) which required them to both interview Japanese native speakers and receive feedback from them on their writing. Table 4.6 presents a brief outline of their demographic data:

Table 4.6: Profile of Pair 4 (Brian/Po)

Pair no.	**Name (Gender)**	**Nationality**	**Major**	**Year**	**Japanese proficiency**	**Relation to peer**
4	Brian (Male)	Australian	Double major in Biology / International Studies	3rd year	High-intermediate Studied Japanese for four years at high school and three years at university Learned Japanese by watching anime for eight years	Friends Classmate in Japanese class Member of the same Japanese student organisation
	Po (Male)	Australian (An immigrant from Taiwan)	Double major in Information Technology / International Studies	3rd year	Advanced level Studied Japanese for two years at high school and two years at university Preparing to take N2	Friends Classmate in Japanese class Member of the same Japanese student organisation

Although Brian and Po applied to participate in this project separately, they know each other as classmates in a Japanese class and as members of the Student Association for Japanese and Australian Students at their university. The pair have similar Japanese language proficiency levels, however, as Po is a Chinese native speaker, he is more proficient at writing in *kanji* (Chinese characters adopted in Japanese writing system) and has a wider *kanji* vocabulary. Although the pair have experience in editing video clips in their leisure time and for school assignments, Po has developed advanced editing skills by editing video clips using the high learning-curve editing software, Adobe Premier.

Pair 5: Lucie/Yuki

Pair 5 consists of two Australian-born university students, Lucie and Yuki. The pair participated in Phase 1 (Semester 1, 2016) of my PhD project. Table 4.7 provides a summary of their profile.

Table 4.7: Profile of Pair 5 (Lucie/Yuki)

Pair no.	Name (Gender)	Nationality	Major	Year	Japanese proficiency	Relation to peer
5	Lucie (Female)	Australian	Double major in Media Arts and Production/ International Studies	6th year	Advanced level Studied Japanese for three years at high school and three years at university Participated in a one-year exchange program twice (during high school and university)	Friends
	Yuki (Female)	Australian Cantonese heritage user	Double major in Visual communication / International Studies	6th year	Advanced level Passed N2 Studied Japanese for three years at high school and for three years at university Participated in a one-year exchange program at a Japanese university	Friends

Lucie and Yuki met in an International Studies class in 2011. Since then, they have developed their friendship. Lucie decided to participate in this study following Yuki's invitation. The pair have a strong background in Japanese language learning and digital

creations. Both participants have studied in Japan as exchange students at a Japanese high school (Lucie) and at a university (both Lucie and Yuki). Although they have developed similar Japanese language proficiency levels, Yuki demonstrated stronger knowledge of '*kanji*' during interactions with Lucie as a heritage user of Cantonese as well as a learner of Mandarin. Both Lucie and Yuki major in courses related to visual communication and were motivated to further develop their visual communication and Japanese language skills by participating in this project.

Pair 6: Jiyoung/Walter

Pair 6 consists of a Korean immigrant (Jiyoung) and an Australian-born student (Walter). They were participants in my PhD project Phase 1 (Semester 1, 2016). Table 4.8 shows an overview of their demographic data:

Table 4.8: Profile of Pair 6 (Jiyoung and Walter)

Pair no.	Name (Gender)	Nationality	Major	Year	Japanese proficiency	Relation to peer
6	Jiyoung (Female)	Australian (An immigrated from Korea)	Japanese	3rd year	Advanced level Studied Japanese for one year at high school and two years at university Preparing to take N2 Won prizes at Japanese speech contests	Strangers
	Walter (Male)	Australian	Double major Japanese / Gaming	1st year (First term)	Advanced level Studied Japanese for four years at high school Passed N3	Strangers

Jiyoung and Walter met for the first time during this study. Walter was paired with Jiyoung, a Korean immigrant, due to his strong interest in learning Korean as well as their compatible timetable. Both Jiyoung and Walter have developed advanced-level Japanese by learning Japanese in different contexts. Jiyoung developed his Japanese language proficiency by learning Japanese for three years at high school and at university. Her strong oral and writing proficiency has won her prizes at Japanese speech contests. Walter developed advanced-level Japanese language proficiency by studying Japanese both in formal and informal contexts. In addition to studying Japanese at high school, Walter has actively sought opportunities to communicate with Japanese native speakers outside the classroom. To practice his Japanese, he participates in social events organised for learners of Japanese and English on and off campus, meets his language exchange friends on a regular basis, and interacts with Japanese speakers online using mobile applications such as HelloTalk (http://home.hellotalk.com/). Both Jiyoung and Walter have experienced video projects while at high school, although they have not engaged in creating digital stories in their leisure time.

Pair 7 (Rena/Rita)

Pair 7 consists of Vietnamese sisters, Rena and Rita. Rena is one year older than Rita. Rena invited Rita to participate in this study. They also participated in the second phase of my PhD project (Semester 2, 2016) which required participants to interview Japanese native speakers as well as receive feedback from them about their script. Table 4.9 shows a summary of their profile:

Table 4.9: Profile of Pair 7 (Rena and Rita)

Pair no.	Name (Gender)	Nationality	Major	Year	Japanese proficiency	Relation to peer
7	Rena (Female)	Vietnamese	Double major in Business / International studies	3rd year	High-intermediate Passed N2 Studied Japanese for five years at high school and 1.5 years at university	Older sister (one year)
	Rita (Female)	Vietnamese	Double major in Engineering / Arts	2nd year	High-intermediate Passed N2 Studied Japanese for four years at high school and one year at university	Younger sister

Rita decided to participate in this project following an invitation from her older sister, Rena. The pair have similar Japanese language proficiency levels. Both Rena and Rita passed N2 (high intermediate Japanese) in JLPT and have enrolled in an equivalent level of Japanese programs in different universities adopting the same commercial textbook. The pair have, however, developed different Japanese language strengths. Rita has developed a higher level of listening and speaking proficiency by actively socialising with Japanese students whom she

met in Japan during a one-month study program or those who came to her university for short-study abroad programs. Rena has developed stronger writing proficiency due to extensive and intensive experience in writing essays in other subjects. Both have experience in creating a digital story as teammates in an entrepreneurship project organised for international students at their university.

4.4.3 Project design

This project was designed to achieve three instructional goals: 1) the students communicate their perspectives in Japanese with peers and audience; 2) the students develop their cultural knowledge; and 3) the students develop their abilities to communicate effectively by creating multimodal texts. In this project, the seven pairs of Japanese language learners created three to five-minute digital stories related to culture using Japanese. They worked on this project with either a self-chosen partner or one paired up for them.

The tasks were designed to be completed as 'pair projects', although they could also have been designed as group or individual projects. As Fernández-Dobao (2012) demonstrated, learners produce compositions with higher accuracy when they work on the task as a group compared with when they do the same task either with a pair or individually. Despite the advantages of group projects, I chose to design the tasks in study as 'pair projects' for two reasons: 1) to coordinate schedules with convenience; and 2) to compare the findings with previous studies (e.g., Hsieh, 2015; Storch, 2002) by adopting similar research designs; learners work in pairs to complete short-term collaborative learning tasks/projects.

Table 4.10 provides a summary of the basic project design for the first experiment. As strict guidelines and timelines were not imposed on each pair, there were some variations in

terms of the task procedures and the length of time spent on each procedure. Details of the task procedures undertaken by each pair are provided in Table 4.10:

Table 4.10: Production procedures

1.	Pairs watched three digital stories produced by learners of Japanese and analysed the rhetorical strategies used in the digital stories. The analysis sessions were conducted over two sessions.
2.	Pairs chose one of the culture related topics and developed their stories.
3.	Pairs wrote their (outline and) script.
4.	Pairs modified their scripts. (Some pairs received feedback from Japanese native speaker(s). They discussed how to modify their script based on this feedback and then revised their script.)
5.	Pairs searched for images and music, and discussed how to edit. (Some participants shot images or video clips by themselves.)
6.	Pairs developed a storyboard.
7.	Pairs practised and recorded narration.
8.	(This researcher provided a video editing workshop to one pair who had not previously edited a video clip.)
9.	Pairs edited stories either during editing session(s) or at home.
10.	The researcher uploaded the pairs' digital stories to YouTube to share the stories with an audience online.

4.5 Data collection

This section starts by describing the types of language used during data collection, followed by further details on the types of data collected for this study. To provide a holistic analysis of language learning during the projects, seven types of data were collected: 1) questionnaire responses; 2) observations; 3) video-recordings; 4) screen captures; 5) semi-structured interview responses; 6) stimulated recall responses; and 7) materials produced or used by the participants. Collected self-reported data from the participants includes semi-structured interviews and stimulated recall responses. Use of self-reported data have several drawbacks such as "selective recall, self-delusion, perceptual distortions, memory loss from the respondent" (Hall & Rist, 1999, p. 297-298). However, the researcher collected self-reported data to "investigate phenomena that are not directly observable, such as learner's self-reported perceptions or attitudes" (Mackey & Gass, 2016, p. 225). Table 4.11 summarises the data collection methods, the time of data collection, and the purpose for which the data was used.

Table 4.11: Methods and sources of data

Methods of data collection	**When the data was collected**	**Use of the data**
Background questionnaire	Prior to commencing the project.	To familiarise myself with the participants. To develop support for the participants. To match the participants as pairs and to determine the data collection schedule.
Observation and observation memo	While creating the digital stories.	To understand the unique project contexts of each project and the participants' first-hand learning process.
Video recordings and screenshots of the video recordings	While creating the digital stories.	To record peer interactions while producing digital stories with audio and visuals information.

Screen captures[11]	While writing / modifying the script, and when editing the digital stories..	To obtain in-depth information about the activities engaged in by the participants with their laptops.
Semi-structured interviews	Prior to commencing the project, at the end of the following sessions, and after the project.	To obtain information that could not be observed directly during the workshops, but which was crucial to generating an in-depth interpretation of the participants' learning experiences from their perspectives.
Stimulated-recall sessions	At the end of the following workshop.	To elicit the participants' thoughts during the event which otherwise would be difficult to recall without watching the video segment.
Materials produced or used by the participants **(e.g., mind-maps, storyboards, scripts, website links, revision history of Google Docs, digital stories)**	After completing each session. (Brian and Po shared a link to Google doc during the session with the researcher.)	To generate an in-depth understanding of the production process engaged in by the participants.

[11] I did not collect screen capture data from pairs who wrote their script individually, who used a laptop with a Windows operating system, or who used a laptop with low processing capabilities.

4.5.1 Language use in data collection

Different languages were used during the data collection process depending on the data collection method. English was mainly used to conduct the semi-structured interviews and stimulated-recall sessions with the participants. However, each pair interacted with their peers using both English and Japanese to different extents according to their Japanese proficiency level, the types of tasks they were engaged in during the segment, and their preferences for language use. Code-switching was frequently observed during peer interactions.

4.5.2 Background questionnaire

Prior to the project, the participants were asked to complete a background questionnaire and submit it via e-mail (Appendix 6). The questionnaire served multiple purposes: to familiarise myself with the participants; to develop support for them; to determine the pair groups; and to decide on the data collection schedule for each pair. The background questionnaire included items pertaining to the participant's nationality, time spent living in Australia, university major, time spent learning Japanese, Japanese language proficiency level, experiences in creating digital content, and available time slot for this project.

4.5.3 Observation and observation memo

Observation is useful to "understand practices, interactions, and events, which occur in a specific context" (Flick, 2009, p. 294). Researcher observations were conducted while the participant pairs were creating their digital stories to understand the unique contexts of their projects and their first-hand learning processes. Observing the production process allowed me to use my knowledge to interpret my observations (Merriam, 1988). Researchers can take four

different stances as an observer: 1) “complete participant”; 2) “participant as observer”; 3) “observer as participant”; and 4) “complete observer” (Junker, 1960; cited in Merriam, 1988, pp. 92-93). My observational stance shifted depending on each project stage due to my dual roles as project facilitator and researcher. Workshops were organised to help the participants analyse the digital stories produced by other learners and to practice video editing. During the workshops, my priority role was ‘participant as observer’ to facilitate discussion and to support editing tasks. Except for the workshops, I took on the role as ‘observer as participant’ as the project was designed as a learner-centred task. In addition, taking on the role of ‘observer as participant’ allowed me to focus on observing and interpreting what was happening in the project contexts. While observing the participant pair interactions, an attempt was made to write down the following items chronologically: 1) the type of activities engaged in by the participants; 2) how they were carrying out the activities; 3) what tools they were using; 4) what they were talking about with their peer; and 5) what I wished to further explore during the semi-structured interviews.

4.5.4 Video-recordings and screenshots of the video-recordings

To complement the above-mentioned researcher observations, the sessions were video-recorded. The benefits of this data collection method include the capability to capture “contextualized face-to-face social behaver in greater detail than can be accomplished using other means” and to “document elements of context within the visual frame lenses” (Hatch, 2002, p. 126). In practical terms, the video-recordings could be replayed to facilitate an in-depth understanding of the participants’ interactions. A video camera was placed one metre (1m) from the participants so that both participants could be recorded in a way that did not

interfere with their interactions. After each session, the video-recorded dialogue by each pair was transcribed for further analysis and to develop the interview questions.

The video-recordings were replayed numerous times while analysing the data to understand the participant pairs' verbal interactions as well as the contextual information including: 1) how they were seated; 2) the activities they engaged in; 3) the tools they used; and 4) how they interacted with each other. After the segments were identified, including visually salient information for data analysis, screenshots were pasted to the relevant parts of the transcription to more easily compare the spoken interactions with the visual information.

Visual images can describe the in-depth contextual information in a way written descriptions alone cannot (e.g., Jewitt, 2005; Kress, 2003). Therefore, the screenshots which supported my argument were selectively chosen, and visual information describing the context in which each interaction took place was provided. To protect the privacy of the participants, the screenshots use in this thesis were converted into a sketch format using an image editing application; '写真加工.com'(Image edit.com) (http://www.photo-kako.com/sketch.cgi). The participants' facial features were erased using 'Paint' preinstalled in Microsoft computers (See Image 4.1).

Image 4.1: A sample of screenshot edited by '写真加工. com' (Image edit.com) and 'Paint'

4.5.5 Screen captures

MacBook provides a screen capture software, Apple Quick Timer. The users can record the activities they have engaged in on screen (with an option to include their conversation). Each participant brought own laptops to work on this project. The researcher requested the participants who brought MacBooks with enough process memory to record their laptop screen while writing and modifying their script, and while editing their digital stories. The recorded data enabled me to retrieve in-depth information about the activities they engaged in while using their laptops, including: 1) the websites the participants accessed to find topic-related information or to solve language-related information; and 2) how the participant pairs divided and completed their tasks.

4.5.6 Semi-structured interviews

I conducted semi-structured interviews with the participants individually prior to the projects, during the project, and at the end of the project. Interviewing the participants allows the researcher to discover what they cannot observe directly, including what has happened of relevance in the past, how the participants feel, what their intentions are, how they organise their worlds, and what meaning they have attached to the world (Patton, 2002). The frequency of the semi-structured interviews ranged from three times to nine times depending on the type of session chosen by the participants (full day sessions or weekly sessions) and the amount of information needed to interview them. The duration of each semi-structured interview ranged from five minutes to one hour.

The focus of each semi-structured interview shifted according to each project stage. For example, the aims of the interview prior to the commencement of the project were to elicit demographic data such as prior experiences of learning Japanese and collaborative group

assignments, and the goals of the project. The interviews during the project aimed to elicit the participants' perceptions of their interactions with peers and their learning behaviours. To elicit information efficiently, tailored interview questions for each learner were developed by watching the video-recordings of his or her previous sessions and by identifying the salient aspects of their interactions and learning behaviours. For example, they were asked about their intentions when dividing the writing tasks and when using Google Docs for writing. The aim of the post-project semi-structured interviews was to access their thoughts about what they had achieved during the projects, how they perceived their learning experiences, and how they evaluated the project as a task to learn Japanese. Follow-up questions were also asked to the participants via e-mail when required to further clarify the information obtained during the semi-structured interviews.

4.5.7 Stimulated-recall sessions

Stimulated-recall sessions are a retrospective data collection method used to elicit from the participants what he or she was thinking at the time of an event engaged in while completing the task. To help the participants to recall their thoughts about the event, researchers show stimulus material such as segments of video-recordings taken during the task (Gass & Mackey, 2000). The purpose underpinning the stimulated-recall sessions in this project was to elicit from the participants their perceptions of the peer interactions and language learning processes during the project. Stimulated-recall sessions were conducted individually. To stimulate the participants' thoughts at that time of the event, they were shown a short video-recorded segment of their interactions with their partner. The participant was then asked to describe what he or she was thinking at the time of the event or their reasons for behaving in the way that they did. To conduct stimulated-recall sessions effectively, the video recordings were carefully

scrutinised shortly after each session to identify the segments which included important phenomenon; that is, the ones I wished to further explore for their perspectives during the stimulated-recall sessions.

4.5.8 Materials produced or used by the participants

The participants used various materials either to create digital stories or to facilitate the digital story production process. The researcher collected the following ten types of materials created or used by the participants; 1) mind-maps drawn either during the sessions (Appendix 7) or semi-structured interviews (Appendix 8); 2) graphics organisers (Appendix 9); 3) outlines (Appendix 10); 4) a map drawn by the pair to decide which locations they should include in their story (Appendix 11); 5) storyboards (Appendix 12); 6) website links shared with peers or used during the project (Appendix 13); 7) drafts and final scripts (Appendix 14); 8) revision history generated by Google Docs (Appendix 15), 9) photos used in the stories; and 10) the digital stories.

The focus of this study was to examine how learners of Japanese engaged in learning Japanese during this project. Therefore, the researcher analysed only three types of above materials to understand their Japanese use and learning; including 1) drafts and final scripts; 2) revision history, and 3) digital stories. The rest of the materials were used to understand their project contexts and their production processes in depth and holistically.

4.6 Data analysis

This section illustrates the data analysis methods employed in this study. The analysis was conducted in the following order: 1) transcribing data; 2) analysing data with Nvivo; 3) analysing patterns of peer interactions (discussed in Chapter 5); 4) analysing language learning inside collaborative dialogue with peers (discussed in Chapter 6 and 7); 5) analysing language learning outside collaborative dialogue with peers (discussed in Chapter 7); and 6) factors mediating their language learning during this project (discussed in Chapter 8). Details of each coding procedure are presented at the beginning of the relevant chapters.

4.6.1 Transcribing the data

To ensure an in-depth analysis of recorded data including video-recordings during peer interactions, semi-structured interviews, and stimulated-recall sessions, the first step was to transcribe the participants' responses. Being users of English and Japanese, the participants fluidly engaged in translanguaging while they were working with peers during this project. To describe the participants' bilingual interactions with frequent code-switching, their interactions were transcribed using the transcription conventions presented in Table 4.12. For instances of code-switching in the middle of the participant's utterance, English translations are provided immediately after the Japanese words using ( ). Japanese pronunciations are provided using roman characters next to the Japanese words if the Japanese pronunciation is an important part of the LRE discussion. Japanese pronunciation with a long vowel is indicated with a horizontal line above each roman character. Important context details are also described using (( )) for readers to understand the participants' interactions (See Example 1 in Table 4.12). For utterances spoken mainly in Japanese, the Japanese translation is provided under the English

utterance (See Example 2 in Table 4.12). Laughter by the participants was transcribed using <hhh>.

Table 4.12: Transcription convention used in this study

Types of utterances	Transcription examples
1. Code-switching in the middle of an utterance	1. Brian: I don't know right '漢字'(Chinese Characters) for '授業 (*jyugyō*)'(class). **Pronunciation of the Japanese word** **Translation for the Japanese word** **Code-switching to Japanese** 2. Po: ((Po did not respond to Brian, but continued to write his own lines via Google Docs.))
2. An utterance mainly in Japanese	Brian: 面白いのがオーストラリアの料理がオーストラリア料理に使うことがあまり関係がないから What is interesting is that (he) did not have a relationship to use Australian cuisines, Australian cuisines. **Translation for mainly Japanese utterance**
Laugher	<hhh>

4.6.2 Analysing the data with Nvivo

After the aforementioned transcriptions were completed, the researcher started data analysis by using Nvivo, a computer-assisted coding software. To prepare data for analysis, all written data such as the transcriptions and materials produced by the participants were imported to the software. Using Nvivo for data analysis provides researchers greater advantages than coding with a pen and paper. Bazeley and Jackson (2013) listed five advantages associated with using Nvivo for qualitative research: 1) "manage data"; 2) "manage ideas"; 3) "query data"; 4) "visualize data"; and 5) "report from the data" (p. 3). Nvivo facilitated my research procedures by providing useful functions such as: 1) showing lists of coding categories and the number per the category (Image 4.2); 2) document searches including for key words using 'text search' (Image 4.3); 3) comparing coding results per selected nodes [coding categories] and cases [participants] using 'matrix coding' (Image 4.4); 4) providing direct access to the documents coded with the selected nodes and cases by clicking the number in the Tables generated by 'matrix coding' (Image 4.4); and 5) comparing documents and cases coded either with selected nodes or cases using 'explore diagram' (Image 4.5).

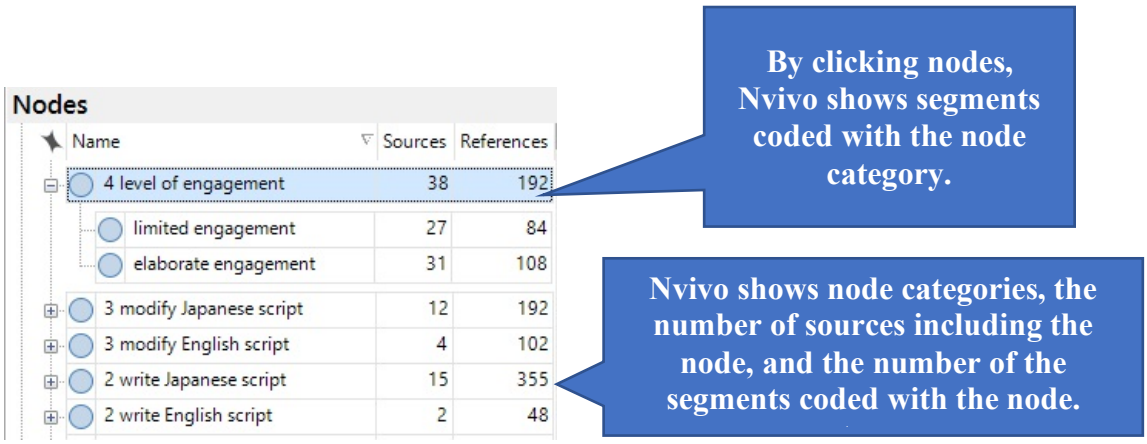


Image 4.2: Node categories and the number of the nodes per category

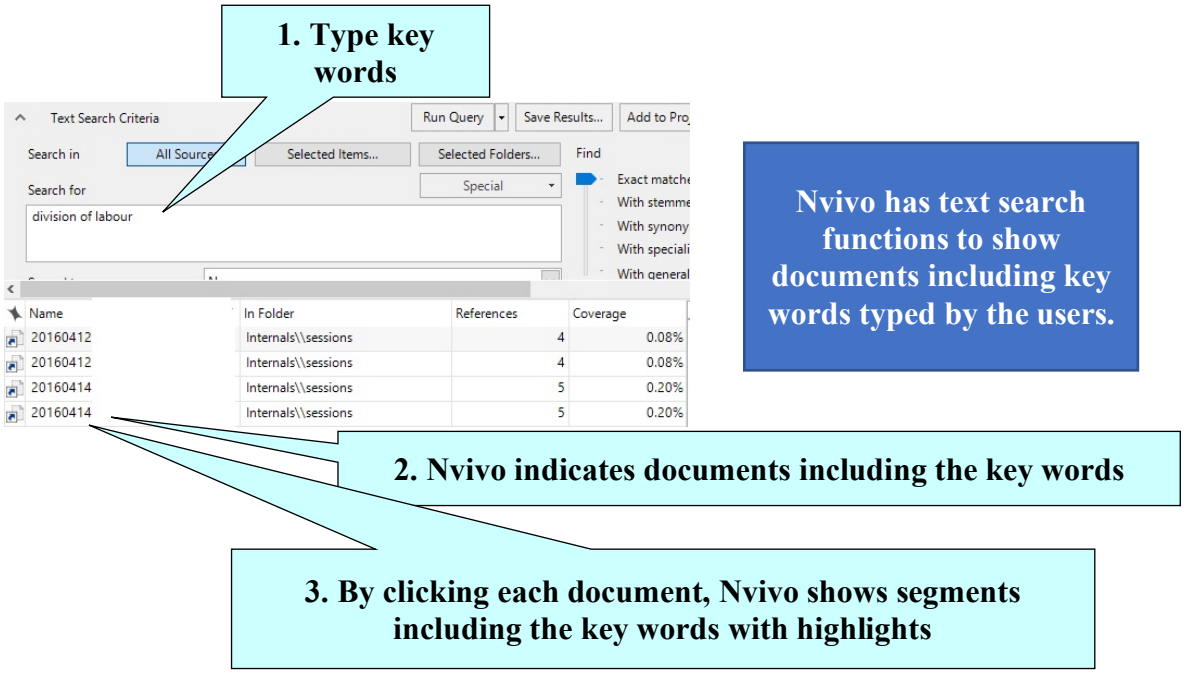


Image 4.3: Word search function

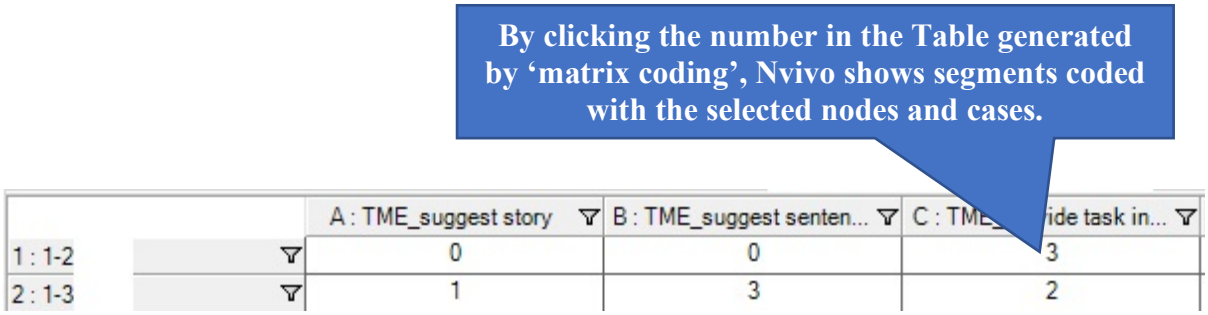


Image 4.4: Matrix coding

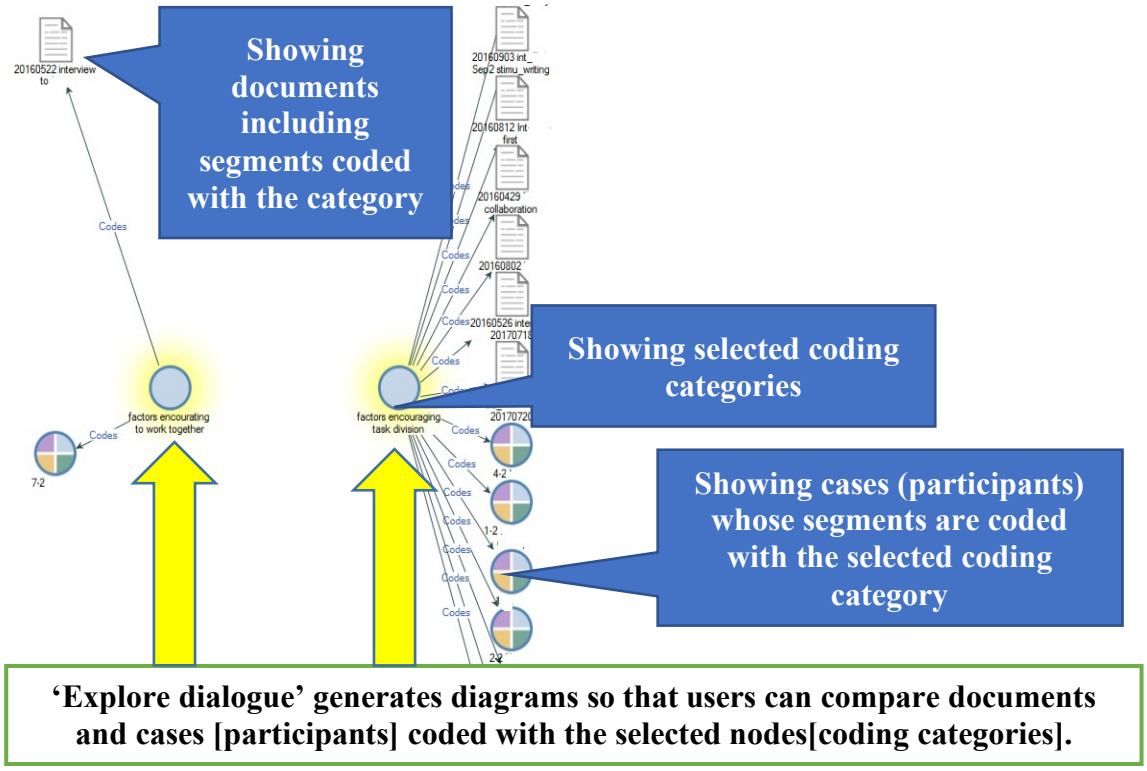


Image 4.5: Explore diagram

To enhance reliability of coding results, Révész (2012) suggested to assess intra-coder reliability and inter-coder reliability. The author defined intra-coder reliability as 'the extent to which a coder assigns the same coding categories to the same data on different occasion, whereas inter-coder reliably to refer to 'the degree to which two or more codes categorize the same data in the same way when they code independently' (p. 216). However, this study did not assess intra-coding reliability because Nvivo does not have such function. In addition, the researcher did not assess inter-coder reliability due to lack of budget to hire a research assistant as a second coder. Despite the limitations, the researcher made efforts to maintain the coding reliability by using the following three strategies; 1) reviewing the coding results several times with some time intervals; 2) comparing the coding results per each coding category; and 3) revising the categories.

The focus of this research is to examine the process of language learning undertaken by seven pairs of Japanese language learners. Therefore, data not directly relevant to the research purposes were excluded from the data analysis. The excluded data included video recordings while participants were analysing digital stories produced by other Japanese language learners, while participants were developing storyboards, and while participants were editing video clips. Also excluded were video recordings taken while Pair 4 and Pair 7 were discussing how to revise their scripts after receiving feedback from Japanese native speakers. This is because the other five participant pairs did not have the same sessions due to the different research design[12]. Table 4.13 summarises the research questions addressed in this study, the theoretical concepts used to answer each question, and the types of data analysed. Details of coding procedures used to answer each research question are provided at beginning of the relevant chapter.

Table 4.13: Research questions and theoretical constructs used for analysis

Research questions (Chapter addressing the research question)	**Theoretical concepts used for coding**	**Types of data**
1) What patterns of dyadic interactions do Japanese language learners develop during collaborative digital storytelling projects? (Chapter 5)	1) Task Management Episodes to examine the extent to which each pair discussed task procedures with a peer. 2) Language-Related Episodes (Swain & Lapkin, 1995, 1998, 2001, 2002) to examine the extent to which participants discussed language uses to solve language problems.	1) Observation and observation memo 2) Video-recordings and screenshots 3) Screen captures 4) Semi-structured interviews 5) Materials produced by the participants

[12] I revised my research design for Phase 2 conducted in Semester 2, 2016. Therefore, Pair 4 and Pair 7 were asked to obtain feedback on their Japanese scripts from Japanese native speakers. They also discussed during their sessions how to revise their script based on the feedback provided by the Japanese native speakers.

2) How do they use collaborative dialogue to resolve their language problems during this project? (Chapter 6)	1) LREs (Swain & Lapkin, 1995, 1998, 2001, 2002) to examine language learning which the participants engage inside peer interactions. 2) Level of engagement (Storch, 2008) to analyse the quality of LREs discussed by each pair 3) The number of LREs correctly resolved or unresolved (Swain & Lapkin, 1995) to analyse quality of LREs discussed by each pair 4) Communication functions that each LRE served in collaborative dialogue to analyse quality of LREs discussed by each pair	1) Observation and observation memo 2) Video-recordings and screenshots 3) Screen captures 4) Semi-structured interviews 5) Stimulated-recall sessions 6) Materials produced by the participants
3) Do they use alternative resources other than their linguistic knowledge, and if so, what resources do they use? (Chapter 7)	1) Resources (Palfreyman, 2006, 2014) to examine how participants used resources while discussing LREs with peers to enhance language learning in collaborative dialogue. 2) Resources (Palfreyman, 2006, 2014) to examine how learners engage in language learning outside collaborative dialogue with peers.	1) Observation and observation memo 2) Video-recordings and the screenshots 3) Screen captures 4) Semi-structured interviews 5) Stimulated-recall sessions 6) Materials produced or used by the participants
4) What factors mediate how they engaged in language learning? (Chapter 8)	1) Six components of activity system and the outcome (Engeström, 1987, 1996, 1999, 2001) and interacting activity systems with a three-layered learning environment model to investigate factors impacting on how participants engaged in language learning during their projects. 2) Contradictions (Engeström, 1987, 1996, 2001) to investigate how contradictions to learn Japanese by discussing LREs with peers impact on their language learning.	1) Observation and observation memo 2) Video-recordings and the screenshots 3) Semi-structured interviews

4.6.3 Analysing Task Management Episodes (TMEs)

Studies of short-term collaborative learning tasks suggest coding categories with which to analyse the functions of first language use by the learners to discuss the task procedures. For example, Swain and Lapkin (2000) identified three functions of first language used by language learners while working on jigsaw and dictogloss tasks with peers: 1) task management; 2) language learning; and 3) off-task talk (Swain & Lapkin, 2000). Storch and Wigglesworth (2003) further classified the functions of first language produced by learners to discuss the task procedures during in-text reconstruction tasks and short joint composition tasks into the following two concepts (p. 763):

> **1) Task management**: "discussion about how the task should be completed or how the written text should be structured"
>
> **2) Task clarification**: "discussion about the meaning of the task prompt and instruction"

Although the coding categories for 'task management' suggested by Storch and Wigglesworth (2003) are useful to analyse learners' dialogue for task management during in-text reconstruction tasks and short joint composition tasks, collaborative digital storytelling projects require the learners to participate in a range of task procedures due to the different task/project designs. Therefore, the following four coding categories were developed to analyse the functions of dialogue engaged in by the participants to discuss the task procedures in the digital storytelling project;

1. **Provide task instruction**: to provide general instructions to complete the tasks.
2. **Confirm task procedure**: to confirm task-related procedures
3. **Suggest story structure**: to suggest how to structure the story
4. **Suggest sentence structure**: to suggest how to structure sentences

Chapter 5 (Section 5.1.1) provides details of the analytical procedures including sample excerpts for each coding category.

4.6.4 Analysing Language-Related Episodes (LREs)

As a concept to operationalise 'collaborative dialogue' for data analysis, Swain and Lapkin (1995, 1998, 2001, 2002) proposed LREs. The authors (1998) defined LREs as "any part of a dialogue where the students talk about the language they are producing, question their language use, or correct themselves or others" (p. 326). The concept of LREs has been widely applied for different research purposes including to compare the efficiency of language learning among learners (e.g., Fernández-Dobao, 2012; Lesser, 2004), to analyse the impact of LREs on quality of writing (e.g., Park, 2015), and to compare the quality of language learning (e.g., Storch, 2008). Researchers further classified LREs according to their research purposes and types of LREs observed in their data. For example, Swain and Lapkin (1998) classified LREs which the participants discussed in a jigsaw task either into 'form-based' LREs or 'lexis-based' LREs. LREs discussed in collaborative writing tasks are divided either into 'form-based LREs, 'lexis-based LREs' and 'mechanics-focused LREs' (e.g., Fernández-Dobao, 2012; Storch, 2008)[13]. Similarly to LREs discussed in collaborative writing tasks, Yilmaz (2011) and Zeng (2017) distinguished LREs produced in computer-mediate collaborative learning tasks into three categories; 'lexical', 'grammatical' and 'orthographic' (LREs discussed related to spelling). In addition to above discussed LREs related to language problems within a sentence level, Swain and Lapkin (2002) included LREs related to discourse level as one of LREs coding categories. The authors elaborated 'discourse' related LREs as episodes discussed "discourse maker, logical sequencing, stylistics, tense sequencing, temporal sequencing, text structure" (p. 292).

[13] The authors used slightly different terminologies to distinguish LREs related to grammar, vocabulary and orthography related LREs. While Fernández-Dobao (2012) used 'form-based LREs, 'lexis-based LREs' and 'mechanics-focused LREs (p. 45-46), Storch (2008) used 'form-focused LREs, 'lexical LREs' and 'mechanical LREs'(p. 100). The third categories of LREs are defined slightly different by both authors. Storch (2008) defined 'mechanical LREs' as episodes discussed punctuation and spelling, whereas Fernández-Dobao (2012) defined 'mechanics-focused LREs' as the ones discussed 'pronunciation, spelling, accentuation, or punctuation problems' (p. 46).

This study applied LREs as a theoretical concept to analyse both quantitatively and qualitatively the language learning process engaged in by the 14 participants when discussing language use as pair groups (and with the researcher using online resources) during this project. The researcher classified what Swain and Lapkin (2002) suggested as 'discourse' related LREs as TMEs by interpreting them as directly related to task procedures; completing a writing script. On the other hand, episodes in which the participants were discussing language use or the meaning in a sentence level were classified as LREs. The segments were further classified into the following three subcategories which the researcher has developed based on pilot analysis of the data: 1) grammar-related LREs; 2) vocabulary-related LREs; and 3) co-occurrence of grammar and vocabulary related LREs. The in-depth analytical procedures used to identify the patterns of peer interactions developed by the seven pairs are outlined in Chapter 5 (Section 5.1.1).

4.6.5 Analysing 'Resources'

Palfreyman's (2006, 2014) concept of 'resources' was used to analyse Japanese language learning by the participants using alternative resources in three learning contexts: 1) when using alternative resources in collaborative dialogue; 2) when engaged in individual learning using alternative resources during the research sessions; and 3) when using alternative resources to engage in learning Japanese outside the research sessions. A unique set of coding subcategories for resources were developed in this study to cater to the different types of resource used in the three learning contexts.

To analyse language learning in the first learning context, two higher-level subcategories were developed: non-online resources or online resources. Non-online resources were further classified into four categories: 1) linguistic knowledge of one participant; 2) linguistic

knowledge of both participants; 3) linguistic knowledge of the researcher; and 4) linguistic knowledge of both the researcher and peers. The subcategories for online resources were"

1) Both participants searched online resources;
2) Participants typed the correct answers;
3) Participants searched online resources following a question from a peer;
4) Participants searched online resources following peer explanation;
5) Participants asked a peer following a search of online resources;
6) Participants searched online resources rather than ask a peer;
7) Participants asked a researcher following a search of online resources; and
8) Participants searched online resources following researcher explanation.

Chapter 7 (Section 7.1.1) provides an in-depth discussion of the analytical procedures used in this study by providing a sample excerpt for each coding category.

4.7 Trustworthiness

Trustworthiness in design-based research is undermined by lack of 'rigour' in methodology (Juuti & Lavonen, 2006). Other criticisms include lack of control over the variables in the learning context (Collins et al, 2004), using small and purposive samples, lack of statistic procedures (van den Akker, 1999), and the impact of the researcher's dual role as designer and researcher on the validity of the findings (Barab & Squire, 2004). Design-based research is also criticised for its limitations in 'generalisability' (Anderson & Shattuck, 2012; Barab & Squire, 2004; Juuti & Lavonen, 2006). Generalisability is the extent to which the contexts and findings of the study are generalisable to broader populations and research contexts (van der Riet & Durrheim, 2006). To respond to these criticisms, this study employed three methodological strategies: triangulation; thick descriptions; and reflection of the researcher's multiple roles during the project. The following section describes each strategy in detail.

4.7.1 Triangulation

Silverman (2014) defined triangulation as "combining multiple theories, methods, observers and empirical materials to produce a more accurate, comprehensive and objective representation of the object of study (p. 289)". Triangulation may in turn enhance the credibility and quality of the research "by countering the concern (or accusation) that a study's findings are simply an artefact of a single method, a single source, or a single investigator's blinder" (Patton, 2015, p. 674). This study included the collection of multiple data "drawn from different sources and at different times, in different places or from different people" (Flick, 2004, p. 178). For example, I compared data drawn from 14 participants from diverse learning backgrounds. The peer interactions at different project production stages were also video-recorded to identify the salient patterns of interaction developed by each pair at different stages of the project. To incorporate the participants' perspectives into the data analysis, my interpretation of the video recordings of the peer interactions were compared with the relevant segment of retrospective data in which the participants expressed their own perspectives (i.e., stimulated-recall sessions and semi-structured interviews).

4.7.2 Thick descriptions

Design-based research is often linked to limitations in the capacity to apply the findings to a broader teaching/learning context. This is due to the nature of the research design; namely, examining real word experiences involving multiple dependent variables (Barab & Squire, 2004). As the counter-strategy, van den Akker (1999) proposed that researchers provide thick descriptions of "process in context" to achieve "analytical forms of generalization" (p. 12). Provision of thick descriptions may help readers to explore the extent to which the research findings are transferrable to "theoretical propositions in relation to their own context" (p.12).

In this study, thick descriptions of the design narrative are provided so that readers can better understand the learning process engaged in by the participants and to assess the extent to which the findings of this study are applicable to their contexts.

4.7.3 Reflection on the researcher's multiple roles

The researcher plays multiple roles in design-based research; namely, designing the experiments, implementing the experiments, analysing the results, and modifying the design of the experiment (Reimann, 2011; Wang & Hannafin, 2005). Barab and Squire (2004) problematised the methodology by stating that multiple roles played by one researcher may threaten the validity of the findings. When conducting this design-based research study I played multiple roles including designer of the project, implementer of the experiment, Japanese language teacher, and researcher during the project. Adopting these multiple roles did however generate several dilemmas in the course of completing this project.

The first dilemma emerged from the gap between my initial experimental design and the participants' learning behaviours. Based on my previous experiences when conducting similar projects in a two-year technical college in South Korea (Nishioka, 2012, 2014b, 2016), I expected the participants to actively interact with each other to construct knowledge of Japanese by discussing LREs with peers. Despite my expectation, some pairs engaged in relatively few interactions to discuss their language problems, even though they worked together to complete their project. Other pairs voluntarily completed part of their project by dividing the tasks outside the research sessions. Moreover, some participants divided their tasks and solved their language problems by themselves using online resources. Thus, the participants engaged in language learning in different ways to those I expected as project designer. In some project contexts, I could have intervened in their learning behaviour as

project designer by asking them to interact with peers for language learning. Despite this option, I chose not to intervene in how the pair worked together during the project to prioritise my role as researcher and collector of naturally occurring data.

Another dilemma I experienced during the project was a conflict between my roles as researcher and Japanese language teacher. Because the participants were aware that I have worked as a Japanese language teacher, some expected me to help them with their language learning during the project. Conceding to this expectation however would have undermined my intention as a researcher to collect naturally occurring data related to their peer interactions. Therefore, I prioritised my role as researcher by focusing on observing their interactions and subsequently I asked them to solve their language problems by themselves. However, I did not reject the Japanese language related questions asked by Pair 5 (Lucie/Yuki) because Yuki's goal was to improve her Japanese by talking with me. Another reason I did not reject their questions was because I had already collected data on peer-only interactions from the other four pairs by the time Pair 5 came back to the project after a two-month break due to scheduling conflicts. Due to my intervention with Pair 5, the characteristics of their language related discussion are different to those of the other six pairs. The characteristics of their interactions are compared with the characteristics of other pairs in Chapter 5-7.

The final and largest dilemma I experienced as a researcher was loss of data due to the participants' voluntary completion of their tasks outside the research sessions. As a researcher, I had a strong desire to observe the language learning process during every project stage. However, some participants arranged voluntarily to complete part of their task independently outside the research sessions to reduce their workload. Therefore, I had to a compromise; that is, to interview them about how they completed the tasks and what they had learned while they were engaged in the tasks.

4.8 Ethical issues

To meet my ethical responsibilities as a researcher, I adopted several procedures during different stages of the study. First, I explicitly described the projects and expected participant roles on the recruitment advertisement (Appendix 3). Second, I made every effort to reduce the risk of harm to potential participants by requesting a third party; namely, lectures at the research sites, to support the recruitment of participants. Participants who wished to be involved in the project or to know more about the project were then invited to contact me via e-mail. I further clarified the project aims and procedures to those participants who took up the invitation.

Third, an in-depth description of the project was included on the Consent form for this study (Appendix 4) so that each participant could make an informed decision. The description include: 1) what the projects were about; 2) the expected roles as the participants; 3) the benefits of participating in the projects; 4) how participant data will be treated; 5) the procedures to protect participant privacy; 6) the participants' right to withdraw from the research study at any time; and 7) the participants' right to choose the data they provide to the researcher. If they agreed to participate in this study, they were asked to sign the Consent form and return it to me via e-mail.

Fourth, I obtained permission from the Macquarie University Human Research Ethics Committee (HREC) and the participants for a second time to include multimodal data which was initially collected for data analysis in this thesis and for future publications. While analysing the data, I realised that using the multimodal data collected for analysis could provide rich contextual information to readers beyond written descriptions only. Therefore, I requested permission from the HREC to include the multimodal data including pictures and video clips taken during the research sessions in my thesis, other publications, and conference

presentations. After the amendment request was approved by the HREC (reference number: 5201500615), I then asked the participants to consent to the use of this multimodal data by signing Consent Form 2 (Appendix 5). Consent Form 2 provided information related to the modifications including: 1) the reasons for requesting their consent; 2) how their data would be presented in the thesis and future publications; 3) how their privacy would be protected; and 4) the benefits of sharing the multimodal data with other researchers and language educators. With a letter to request their consent to the research modifications, I shared custom-made samples of the multimodal data with each pair so that they could visualise how the pictures and video-recording data will be presented in this thesis, future publications and conference presentations[14].

Finally, I made efforts to maintain participant anonymity by using pseudonyms chosen by me and by erasing all images of their faces.

[14] I obtained consent from 13 out of the 14 participants to use their picture images and audio/video segments for this thesis and future publications. However, I decided to use sketches instead of pictures for this thesis due to the explicit visual effects.

4.9 Conclusion

This chapter discussed the details of the research methodology adopted for this study. In Section 4.2, the characteristics of design-based research adopted for this study were outlined. Also discussed were the reasons why design-based research is appropriate for this study. Section 4.3 discussed the research procedures required to complete each research stage and how they were completed. Section 4.4 provided details of the development and implementation of the project design. Also provided was brief background information on each participant as this personal information is important for readers to understand the learning behaviours observed during this project. Section 4.5 explained the types of data collected, followed by descriptions of the data analysis procedures (Section 4.6). In Section 4.7, the criticisms related to design-based research were elaborated, and the strategies employed to mitigate the associated problems and to enhance the trustworthiness of this study were outlined. A discussion of the way in which this research project met the ethical responsibilities of human research was provided in Section 4.8.

Regarding the following chapters, the findings to emerge from the data analysis are discussed in the following orders: Chapter 5 addresses Research Question 1 by presenting the patterns of peer interactions developed by the seven participant pairs during the projects. Research Question 2 will be answered in Chapter 6 by discussing how they engage in language learning in collaborative dialogue with peers. Chapter 7 will address Research Question 3 by analysing their language learning by using alternative resources other than their own linguistic knowledge both inside and outside collaborative dialogue with peers. Chapter 8 will answer Research Question 4 by identifying factors mediating how the participants engage in learning Japanese during this project.

Chapter 5

Patterns of peer interactions in collaborative digital storytelling projects

5.1 Introduction

This chapter examines the patterns of interaction developed by the seven pairs during their collaborative digital storytelling projects. Two aspects of their interactions were analysed to achieve this aim: 1) the characteristics of the four patterns of peer interactions related to task and role allocations, and the distribution of TMEs and LREs during this project; and 2) the characteristics of the TMEs per interaction pattern. Section 5.1.1 illustrates the in-depth analytical procedures to identify the two aspects of peer interactions the seven pairs developed. Section 5.2 provides brief descriptions of each project and the task procedures used by each pair. The reason I provide the background descriptions is to help the reader to familiarise themselves with each project context. This contextual information is crucial to an understanding of the patterns of peer interactions developed by the seven pairs and the task procedures they used (discussed in this chapter), their engagement in language learning (discussed in Chapter 6 and 7), and the factors mediating the interaction patterns and language learning (discussed in Chapter 8). Section 5.3 discusses the characteristics of the four interactions patterns developed by the seven pairs per interaction pattern by focusing on their task and role allocation, and the distribution of TMEs and LREs during the projects. In Section 5.4, the TME characteristics are discussed quantitatively and qualitatively per interaction pattern. I conclude this chapter by summarising the characteristics of the four interaction patterns observed during the collaborative digital storytelling projects.

5.1.1 Analytical procedures

The aim of Chapter 5 is to address Research Question 1; what patterns of dyadic interactions do the seven pairs of Japanese language learners develop during collaborative digital storytelling projects. To answer this research question, the following three-step coding procedure was initially conducted: 1) analysing task and role allocation during the three production stages; namely, developing a story, writing a script, and modifying the script); 2) identifying the distribution of TMEs and LREs' (Swain & Lapkin, 1998) during the three production stages; and 3) identifying the interaction patterns by comparing the coding results to emerge from procedures 1 and 2. Table 5.1 summarised the three-step coding procedures per each stage; 1) purposes of the coding procedures; 2) data sources; 3) and coding categories used for the analysis. Each analytical procedure is described separately.

Table 5.1: A summary of the three-step coding procedures

Coding procedures	Purpose of the procedure	Data sources	Coding categories
Coding procedure 1	Identify patterns of task and role allocation by each of the seven pairs during the three production stages.	Video recordings of peer interactions during the three production stages	1) Pattern A: same task and same role 2) Pattern B: same task and different roles 3) Pattern C: different tasks and same role 4) Pattern D: different tasks and different roles
Coding procedure 2	Identify the types of dialogue each pair engaged in during the three production stages.	Transcription of the video recordings during the three production stages.	**TMEs** 1) Provide task instruction 2) Confirm task procedure 3) Suggest story structure 4) Suggest sentence structure **LREs** 1) Grammar-related LREs 2) Vocabulary-related LREs 3) Co-occurrence of grammar and vocabulary related LREs
Coding procedure 3	Identify the patterns of peer interactions by comparing the coding results to emerge from Coding procedures 1 and 2.	Coding matrix generated by Step 1 (Appendix 16) and 2 (Appendix 17)	

Coding procedure 1: Task and role allocation

The first coding procedure was conducted to examine how each pair allocated their tasks and roles during the three production stages. The peer interactions while creating their digital stories during the three production stages were video-recorded. The recordings were then analysed to identify the task and role allocation of each pair per production stage using the following four coding categories:

1. Pattern A (Same task same role)
The pair works on the same part of their task synchronously by playing the same role during the production stage.

2. Pattern B (Same task and different roles)
The pair works on the same part of their task synchronously but they play different roles during the production stage.

3. Pattern C (Different tasks and same role)
The pair works on different parts of their task synchronously but plays the same role during the production stage.

4. Pattern D (Different tasks and different roles)
The pair works on different parts of their task by playing different roles during the production stage.

Based on the coding results, I developed coding matrixes for each pair per production stage (Appendix 16, 17). I present Table 5.2 as an example of the coding matrix which I developed for Pair 4 (Brian/Po).

Table 5.2: An example of coding for task and role allocation by Brian and Po

Name of the participants	1. Developing a story	2. Writing a script	3. Modifying the script
Pair 4 (Brian and Po)	Pattern A	Pattern D	Pattern D

The story-development stage of Pair 4 (Brian/Po) was coded as 'Pattern A' because they discussed their story together. However, the writing stage was coded as 'Pattern D' (different tasks and different roles) because they wrote different lines of their script synchronously using Google Docs, an online collaboration application. Po played an additional role as 'editor' while they were writing different sections. The modifying stage was coded as 'Pattern D' because Po revised a part of the script while Brian was still writing or away from his computer to have a break. By repeating the same coding procedures, a coding matrix was developed for each pair.

Coding procedure 2: Dialogue analysis

The second coding procedure involved an analysis of the dialogue between the peers during the three production stages, particularly their discussion of task procedures and language learning. To analyse the peer dialogue both quantitatively and qualitatively, a transcription of the video-recording of the three production stages was coded, drawing on two concepts: 1) TMEs; 2) LREs (Swain & Lapkin, 1998).

1) Task Management Episodes

The first concept applied in the second coding procedure was TMEs. This study developed the concept drawing on 'Task management' proposed by Storch and Wigglesworth (2003). The authors defined 'Task management' as a "discussion about how the task should be completed or how the written text should be structured" (p. 763). The concept was useful to analyse the frequency and quality of the discussion of task procedures during the three stages in this study. However, in contrast to the writing tasks examined by Storch and Wigglesworth (2003), digital storytelling projects involve a different range of task procedures. Therefore, the concept was adapted to TMEs, coding categories particularly suitable for an analysis of the task procedures engaged in by the participants during their collaborative digital storytelling

projects. In this study, TMEs are defined as 'any part of a dialogue where learners discuss their task procedures with peers'. Based on the analysis of my pilot study data, the following four sub-coding categories were developed for the TMEs.

1. **Provide task instruction**: to provide general instructions to complete their tasks.
2. **Confirm task procedure**: to confirm task-related procedures
3. **Suggest story structure**: to suggest how to structure their stories
4. **Suggest sentence structure**: to suggest how to structure sentences

Third and fourth types of TMEs could be interpreted as what Swain and Lapkin (2002) defined as 'discourse' related LREs. However, this study classified these episodes as TMEs as focus of the discussion is task procedures; discussing how to structure stories and sentences to complete their scripts.

Table 5.3 shows the four TME coding categories and a sample excerpt of each coding category:

Table 5.3: Coding categories for TMEs and the sample excerpts

Coding categories	**A sample excerpt for each coding category**
1. **Provide task instruction**	1. Tessie: ((Passing her Japanese scrip to Yujin) Could you check (my) grammar mistakes (in this script)? 2. Yujin: ((Received the script))
2. **Confirm task procedure**	1. Sherry: ((Confirming how many frames she should create for their storyboard)) Oh, ok. How many frames (should I create for our storyboard)? 2. Stephanie: 15.
3. **Suggest story structure**	1. Lucie: Should have a bigger theme? 2. Yuki: So each moment should be continue. Two of us go back and fourth. What if you invest yourself to this character? If you invest yourself to this character, (our audience will) switch back to you.
4. **Suggest sentence structure**	1. Stephanie: ((Stephanie is suggesting sentences for food section)) We can say China town is the heart of Sydney. It is very popular in Sydney. You can buy a lot of Japanese food such as *ramen*, *sushi* and y*akitori*. And you can say just few things. Umm. ‘おいしい’(delicious). 2. Sherry: ((Typed Stephanie’s’ suggested sentences for their English script))

2) Language Related Episodes

To examine the frequency and quality of the dialogue by each pair when discussing their language problems, the LRE concept was adopted. LREs are defined as "any part of a dialogue where learners talk about language they are producing, question their language use, or correct themselves or others" (Swain & Lapkin, 1998, p. 326). Although Swain and Lapkin (2002) included LREs related to discourse level as LREs. However, this study interpreted LREs as dialogues related to language problems in micro level such as 'grammar-related LREs', 'vocabulary-related LREs'. This study classified episodes in which participants discussed language problems at discourse level as TMEs. As analysis of my pilot study data showed that the participants discussed grammar-related LREs and vocabulary-related LREs both separately and co-concurrently. Therefore, the segments in which each pair discussed LREs were coded using the following three sub-coding categories:

1) Grammar-related LREs: to discuss Japanese grammar

2) Vocabulary-related LREs: to discuss Japanese vocabulary

3) Co-occurrence of grammar and vocabulary-related LREs:

to discuss both grammatical and lexical aspects of Japanese co-concurrently

Table 5.4 provides the LRE coding categories and a sample excerpt for each category:

Table 5.4: Coding categories for LREs and a sample excerpt for each category

Coding categories	**Sample excerpt for each coding category**
1. Grammar-related LREs	1. Yujin: ((Yujin is advising Tessie to use present form in her script after she read Tessie's script)) Can you use present form (in your section)? 2. Tessie: Why? 3. Yujin: As you describe the (Japanese) festival held every year.
2. Vocabulary-related LREs	1. Sherry: What is buffet in French? 2. Stephanie: Buffet is buffet. 3. Sherry: Japanese word is 'バイキング (*baiking*)'(buffet).
3. Co-occurrence of grammar and vocabulary-related LREs	1. Walter: You can choose you have many choices. Amm. You have many amm. **Choices to choose**. **Walter is asking Jiyoung two questions in this turn; 1) Japanese word to describe 'choose' ; 2) conjugation form to state 'you ca nchoose'.** 2. Jiyoung: ((Jiyoung is suggesting vocabulary and grammar at the same time to construct 'choices to choose' in Japanese) **'選べます'((You) can choose).** What about **Jiyoung provided two suggestions in Turn 2.; 1) use ' 選ぶ'(choose) to state 'choose'; 2) conjugate the word as '選べます'((you) can choose) to describe 'you can choose'.** 3. Walter: ((Confirming what Jiyoung has said)) いろいろたくさんのレストランっていったよね。'((You) have just said there are a lot of arious restaurants in Sydney). 'たくさんあるからたくさんあるので'(As (we) have a lot of (restaurants in Sydney) as (we) have a lot of (restaurants in Sydney). 4. Jiyoung: '珍しい食べ物を発見'((You can) discover rare food) 5. Walter: '発見する'(Discover). 6. Jiyoung: What about '選べます'((you) can choose). '選んで食べてみることができます。'((You) can choose and try to eat (various foods in Sydney).

Coding procedure 3: Comparing coding results

The third coding procedure conducted to identify patterns of peer interactions was to compare the coding results to emerge from procedures 1 and 2. To compare the coding results, a coding matrix was created for each pair by summarising the coding results from the first and second coding procedures.

I demonstrate analytical procedure 3 using Table 5.5 as an example. Completion of the aforementioned coding procedure 1 and 2 generates a coding matrix presented in Table 5.5, for example.

Table 5.5: An example of results emerged from three step coding-procedures

	1. Task and role allocation			**TMEs**	**LREs**
	1. Developing a story	**2. Writing a script**	**3. Modifying the script**		
Pair A	Pattern A	Pattern B	Pattern B	400	150
Pair B	Pattern A	Pattern C	Pattern C	100	30
Pair C	Pattern A	Pattern C	Pattern D	150	20

As seen in Table 5.5, Pair A, Pair B and C, show different trends in terms of their task and role allocation, distribution of TMEs and LREs. First of all, Pair A completed writing and modifying tasks by working on the same part of their tasks, whereas Pair B and C divided their writing and modifying tasks. In addition, Pair A, Pair B and C initiated different amount of TMEs and LREs during this project. Pair A actively initiated both TMEs and LREs, while Pair B and C produced much fewer TMEs and LREs than Pair A did. I classified Pair B and C as the same interaction pattern as they developed similar characteristics in terms of their task and role allocation, distribution of TMEs and LREs.

5.2 Seven projects and the task procedures

This section provides brief background information for each project undertaken by the seven pairs. Section 5.2.1 shows an overview of the seven projects completed by each pair. From Section 5.2.2 to 5.2.8 provides brief description of the seven projects per each pair; including each pair, the structure of digital stories they crafted, and the task procedures they used to complete their projects. This background information is provided because it is crucial for readers to understand the pairs' interactions for task management (discussed in this chapter) and language learning (discussed in Chapters 6 and 7), as well as the mediation factors (discussed in Chapter 8). Section 5.2.9 provides a summary of each project.

5.2.1 Overview of the seven projects and four interaction patterns

Despite some variations, the seven pairs completed their projects by developing four interaction patterns; 1) division of labour; 2) collaborative storytelling; 3) collaborative knowledge constructions; and 4) limited spoken interactions. Table 5.6 shows an overview of four interaction patterns developed by the seven pairs, characteristics of the interactions, and their projects.

Table 5.6 Overview of seven projects and four interaction patterns

Interaction patterns	Characteristics of the interaction	Pair	Topic
1. Division of labour	Completing their projects by splitting their subtasks to each participant (and allocating different roles to each learner in some projection stages).	Pair 1 Tessie/Yujin	Japanese traditional and Anime festivals
		Pair 2 Kasumi/Sky	Experiences to live and study in Australia
		Pair 3 Sherry/Stephanie	Japanese culture which audience can experienced in Sydney
		Pair 4 Brian/Po	Experiences to live and study in Australia
2. Collaborative storytelling	1) Developing stories by actively discussing story structure. 2) Resolving language problems individually using online resources although they also consulted their language problems with peers.	Pair 5 Lucie/Yuki	Experiences to live and study in Japan
3. Collaborative knowledge constructions	1) Deciding their task procedures by discussing task procedures with peers. 2) Resolving language problems by actively discussing with their peers.	Pair 6 Jiyoung/Walter	Multi-culture in Sydney
4. Limited spoken interactions	Completing their project by having limited spoken interactions to discuss task procedures as well as language problems.	Pair 7 Rena/Rita	Coffee culture in Australia and Japan

The first pattern, 'division of labour' is characterised as completing their projects by splitting their subtasks to each participant. Some pairs also allocated different roles to each learner in some project stages. Characteristics of the second pattern, 'collaborative storytelling', is their strong focus on developing stories by actively discussing story structure with peers. The pair often resolved their language problems by consulting online resources although they also occasionally asked language-related questions to their peer. The distinctive feature of 'collaborative knowledge constructions' is their joint-decision in their task procedure as well

as their language use in their digital stories. In particular, they made efforts to resolve their language problems by pooling their linguistic knowledge. The fourth pattern, 'limited spoken interactions', showed characteristics of completing their projects by having fewer spoken interactions with peers to discuss their task procedures and language problems with peers.

5.2.2 Pair 1: Tessie and Yujin

> When we did this project, we were not good friend yet. I did not know her well. I didn't want to bother her. So, I checked Google first and I could not solve the problem, I asked her. (Tessie)

(Tessie and Yujin are writing different parts of their script synchronously using their own laptops.)

Pair 1

Pair 1 consists of two Chinese international students, Tessie and Yujin. They met as classmates in their Japanese class at university. Yujin is at a higher language proficiency level (intermediate) than Tessie (low intermediate) due to prior exposure to Japanese watching Japanese *Anime* and family trips to Japan.

Structure of their digital story

Based on Yujin' suggestion, Pair 1 (Tessie/Yujin) created a digital story to introduce Japanese festivals held in Sydney. They developed their story using their background knowledge and by searching websites. Their story is structured with the following sections: 1) introduction; 2) traditional festivals (produced by Tessie); 3) SMASH! – an anime festival held in Sydney (produced by Yujin); and 4) conclusion. The pair tied together subsections written individually to create 'a story' using 'Japanese festivals' as a shared theme. Their digital story can be retrieved from:

https://www.youtube.com/watch?v=chzz1Omg_ZU

Task procedures

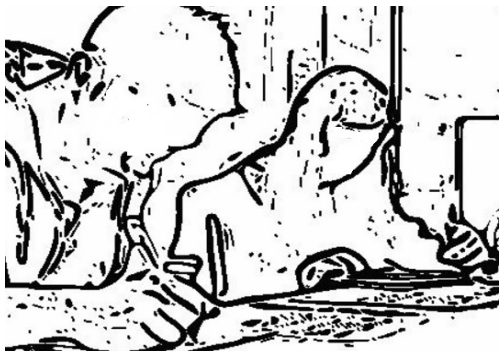
Pair 1 (Tessie/Yujin) had to complete the project while also managing their heavy academic workload to complete assignments and prepare for exams. Therefore, Tessie provided two suggestions to Yujin; namely 1) splitting their tasks to research their own topics and write a Japanese script according the subtopic; and 2) completing these tasks prior to attending the next session I arranged for data collection. Yujin agreed with the suggestion and they arranged to complete their section individually at home. Despite their arrangement, Tessie could not complete all her section due to her exams.

In the following session, Yujin could have worked with Tessie – her less proficient peer – by providing Japanese language support. However, to prioritise completion of the task, Yujin instructed Tessie to complete her section independently while she completed the introduction and conclusion. Tessie tried to complete the writing task independently by solving her language problems using online resources such as online dictionaries, Google Translate, and other websites relevant to her topic. However, she occasionally interrupted Yujin to consult with her on task procedures and to ask for help when she could not solve a problem by herself. While

Tessie worked on her section, Yujin would revise at home the script Tessie had completed. She then completed their introduction and conclusion. Details of their task procedures are provided in Appendix 18.

5.2.3 Pair 2: Kasumi and Sky

> I am a full-time uni student and I have many stuff to do. And there are a lot of assignments, I don't know how much time I have to work with Sky. So, if we split our work we have less to worry about in getting back to you[the researcher]. (Kasumi)



(Kasumi and Sky write their sections individually without interacting with each other for 44 minutes.)

Pair 2

Pair 2 consists of two intermediate learners of Japanese, Kasumi and Sky. They were classmates in a Japanese class at university at the time of data collection.

Structure of their digital story

Pair 2 (Kasumi/Sky) created a digital story in which they share the study-abroad experiences of two Japanese students studying at the university; *Takumi* and *Ayumi*. Based on interviews conducted with the two Japanese students, the pair structured their story in four sections; 1) introduction; 2) *Takumi's* story (produced by Sky); 3) *Ayumi's* story (produced by Kasumi); and 4) conclusion.

They connected the individually-written subsections to create ‘a story’ using ‘study-abroad experiences’ as their shared theme. Their story can be viewed at: https://www.youtube.com/watch?v=q_nKDBmBYNE

Task procedures

Pair 2 (Kasumi/Sky) developed their digital story by allocating different tasks and roles to each participant, although they did work together to develop their story. The pair interviewed two Japanese international students, *Takumi* (a male student) and *Ayumi* (a female student). They allocated their tasks and roles for the interview task according to their strengths. Sky took on the role of interviewing his Japanese friends using his existing social network of Japanese friends on campus; whereas Kasumi has experience in transcribing interview data at an anime event and took on the role of summarising the interview data and writing the English transcript.

Pair 2 divided the writing tasks according to their and the Japanese students’ gender. Sky suggested to write their scrip using a computer as typing is faster than writing in a paper for him. However, the pair decided to write their script in papers as Kasumi has commented that she may forget ‘her words’ if she has to type. They wrote their own sections for 44 minutes without interrupting each other. After completing their scripts, Sky revised his script based on feedback provided by his Japanese friends on campus. Kasumi received feedback from her Japanese friend in Japan using Facebook chat as she did not have any Japanese friends in Australia. In-depth descriptions of their task procedures are provided in Appendix 19.

5.2.4 Pair 3: Sherry and Stephanie

> Maybe you[the researcher] would've expected us to work in a different way, but because we are Australian students, we have to use our own knowledge and our own learning style. So, I think we worked out the easiest and the least troublesome way to work together… Especially, when you're two students, both have a lot to do, outside of the project. I wish I had more time to focus on the project, but we had to do the best with what we had. Sometimes, instead of spending more time working together, we had to use our digital tools to make it more efficient. (Stephanie)

(Stephanie (right) is completing the easier sections according to her Japanese proficiency level using Google Docs, while Sherry (left) is writing the other sections.)

Pair 3

Pair 3 consists of participants with a large proficiency gap, Sherry and Stephanie. Sherry developed her advanced level language proficiency by learning Japanese for five years. Stephanie had completed only a one-year Japanese course at the time of data collection. The participants did not know each other prior to participating in this project. The researcher paired them due to their compatible timetable.

Structure of their digital story

Pair 3 (Sherry/Stephanie) crafted a digital story about the Japanese culture that people can explore in Sydney. They created the story using their background knowledge of the topic and by video-recording locations where people can experience 'Japanese culture' in Sydney. Their story comprises four sections: 1) introduction; 2) food and shopping; 3) culture and language; and 4) conclusion. Their story can be accessed from https://www.youtube.com/watch?v=UVxqql5vi30

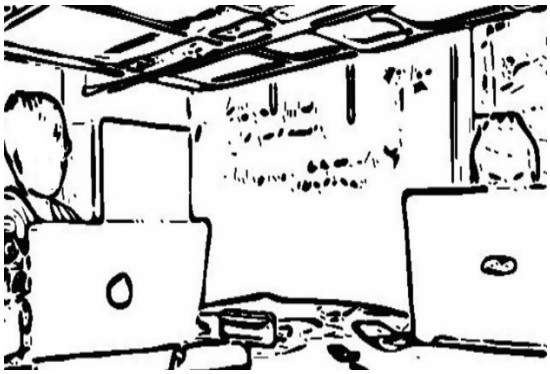
Task procedures

Pair 3 (Sherry/Stephanie) divided their tasks and roles into writing and modifying stages due to the large Japanese language proficiency gap between them. After they developed their story together, they completed the English script together by dividing it into different roles. Stephanie narrated the story in English, and Stephanie helped to type the English transcript. Shortly after they started to write the transcript, Stephanie suggested that they use Google Docs so that she could contribute to the project according to her proficiency level. Sherry agreed with Stephanie's suggestion because she had experience using Google Docs for group projects in other university subjects. Using the real-time monitoring function on Google Docs, Sherry let Stephanie write the easier parts independently. She then completed the script by revising what Stephanie had written and by writing the uncompleted sections.

After completing all of their Japanese script, Sherry applied her advanced Japanese language skills to revise what they had written outside the writing session by incorporating suggestions provided by Japanese members of the Lang-8 (http://lang-8.com/); a SNS developed to encourage language learners to practice writing in the target language by socialising with native speakers. Details of the task procedures are provided in Appendix 20.

5.2.5 Pair 4: Brian and Po

> I guess Po [his peer] seems to relay on what sounds more natural (as Japanese). You can always get machine translation, but they are never good as actually gaining (feedback) from someone who has some experiences in Japanese. (Brian)



(Brian (right) and Po (left) are discussing and writing different lines of their scripts synchronously using Google Docs.)

Pair 4

Pair 4 consists of Brian and Po. They are classmates in a Japanese class and members of the Japanese Australian Students Associations at their university. Po has advanced level Japanese language skills; whereas Brian has intermediate level Japanese language skills.

Structure of their digital story

Pair 4 (Brian/Po) developed a digital story which shares the perspectives of Japanese international students in Australia. They developed their story based on interviews with Japanese friends studying at their university. Their story comprises four sections; 1) introduction; 2) culture shock experiences in Australia; 3) university life at an Australian university; and 4) conclusion. Their story can be retrieved from:

https://www.youtube.com/watch?v=aCG0ZvarSAc&lc=z13pttzh4xv2v3qlg23mwvszvte3yn0ca

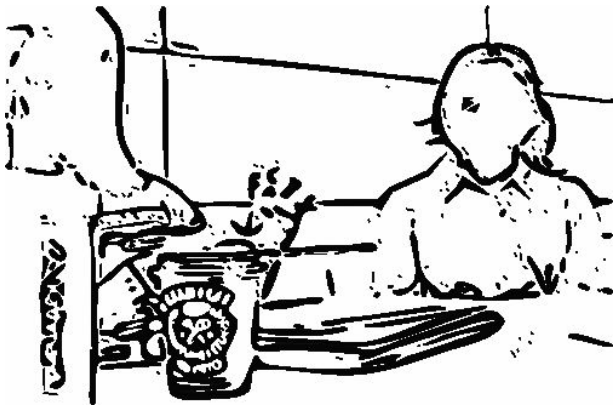
Task procedures

Pair 4 (Brian/Po) completed their digital story by dividing the tasks between them; that is, writing and modify the script, although they developed the story together. The pair agreed to use Google Docs to write their script because it is "being used by every university student" and it has the capability of "real time remote collaboration on the same document" (Po, e-mail). As the task requirement for participants who joined my study in Phase 2, I requested the pair to create a story based on interviews to Japanese as well as to receive feedback to their script from Japanese.

After Brian and Po discussed the overall structure of their story, they wrote their script a few lines at a time using Google Docs. As they each completed a few lines they would monitor each other's progress using the real-time monitoring function on Google Docs. However, they frequently interrupted each other to discuss the task procedures and any language problems they experienced during the writing stage. As an advanced Japanese language learner, Po revised the completed lines while Brian continued writing or had a break. They also received feedback on how best to revise their script via meets with their Japanese friends on campus. Brian and Po's task procedures are explained in depth in Appendix 21.

5.2.6 Pair5: Lucie and Yuki

Lucie: Connect (our stories) together (with a theme). So, idea is to start, struggle and resolution.
Yuki: That kind of story is very western. Do you remember I told 'moments'? For me, Japan does not have to be a struggle. Oh, a piece of moments. *Shinkai Makoto* (a Japanese director and writer). He has a story (although he does not show a theme of his story explicitly).
Lucie: Otherwise (we end up having) so many (separate) stories.
Yuki: I guess you are right.
Lucie: You need reasons (to encourage audience) to stick to us. What makes interesting the story (for our audience)? Why they care (our) stories?
Yuki: That's true.
Lucie: But (our) audience is Japanese (who are familiar with different story structures from us).



(Lucie and Yuki are enthusiastically discussing their story structure.)

Pair 5

Pair 5 consists of two experienced and active digital creators, Lucie and Yuki. They have extensive experience in creating digital content including video clips due to their study majors (Media Production for Lucie, Visual Communication for Yuki). They have known each other since 2011 as classmates in their major subject and have socialised as friends. Both have studied in Japan as exchange students and are both advanced level Japanese language learners.

Structure of their digital story

Pair 5 (Lucie/Yuki) created their digital story with the aim to share their memories of Japan as exchange students. Their story comprises six sections; 1) introduction; 2) spring (provided by Yuki); 3) summer (produced by Lucie); 4) autumn (produced by Yuki); and 5) winter (produced by Lucie); and 6) conclusion. Each participant developed and wrote two episodes for two seasons, although they actively interacted with each other to develop and connect their episodes. To connect the four episodes written individually as 'a story', they organised the four episodes in an omnibus format using 'four seasons' as a shared common theme. Their story can be viewed at:

https://www.youtube.com/watch?v=mj40cQGkozM&t=36s

Task procedures

Pair 5 (Lucie/Yuki) experienced schedule conflicts during the project due to being final-year students at university. Lucie was busy completing her Honours project and Yuki had started work at a company. Due to their busy schedules, they decided to create their digital story with a three-day intensive session, followed by the completion of the rest of the tasks at home. The pair demonstrated strong interest in collaboratively developing their story by dedicating 260 minutes to discuss their story structure over two sessions. However, the pair completed the writing tasks individually. They divided the writing tasks based on the episodes chosen during the story development stage.

After completing their English script individually at home, Lucie and Yuki decided to scale down their project to make it more feasible. In the following session, they discussed how to trim down the script together. Once the editing was completed, Lucie and Yuki started to rewrite their sections in Japanese individually, although they interacted with each other to discuss the task procedures and any language problems they experienced. After completing

their script, they revised the Japanese transcript individually and requested a final revision by this researcher. An in-depth description of Lucie and Yuki's task procedures are provided in Appendix 22.

5.2.7 Pair 6: Jiyoung and Walter

> The thing that I (have) realised was that because the background of studying Japanese was really different, for me and him. I've studied (Japanese) in formal courses, so I was strong with grammar and stuff, but I was weak at vocabs. But because [Walter] has studied (Japanese) with his own passion and with his own method, he knew a lot of vocabs, so sometimes he was saying something that I didn't know. And then maybe I have said something that he doesn't know, maybe. (Jiyoung)

(Jiyoung and Walter are discussing their ideas as they write their script together)

Pair 6

Pair 6 consists of advanced level language learners, Jiyoung and Walter. The pair met for first time during this project. This researcher paired Jiyoung – a Korean immigrant – with Walter due to Walter's interest in learning Korean and their compatible timetable.

Structure of their digital story

Pair 6 (Jiyoung/Walter) developed a digital story which explores multiculturalism in Sydney. It focuses on the diversity of people, foods and leisure activities. They created their

story based on their first-hand experiences of living in Sydney as well as in other countries. Jiyoung and Walter's story comprises five sections; 1) introduction; 2) people; 3) food; 4) leisure; and 5) conclusion. Their story can be retrieved at:

https://www.youtube.com/watch?v=4H7c6MLfE1g&t=107s

Task procedures

Pair 6 (Jiyoung/Walter) chose to work on the same part of their task together throughout the project, except for when editing their video clip. They discussed the development of their story and worked together to write and modify their script. Because Walter has only limited literacy skills in typing Japanese using a computer, Jiyoung helped to type the script during the project. After they modified the script, Jiyoung and Walter asked this researcher to perform a final revision. Details of Jiyoung and Walter's task procedures are presented in Appendix 23.

5.2.8 Pair 7: Rena and Rita

> A lot of group assignments I did (in other subjects at university). I always had bad experiences with it. Like most of the time I must deal (with group assignments) by myself. So, I used to work (on the group assignments) by myself. Recently I did (a group assignment) for finance. Two of them[classmates] did not do anything. One girl pretended she is useful, but she was not. She did not do even one question. Another guy tried to help (me) but he was behind the lectures (and he did not understand the assignment well). He helped a small portion (of the assignment), and I had to do the rest (by myself).
>
> (Rena)

(In a group study room, Rita (left) is using the shared screen feature on her laptop to monitor what Rena (right) is writing so she knows what information to research for Rena.)

Pair 7

Pair 7 consists of Vietnamese sisters, Rena and Rita. Although they learned Japanese at different universities, they used the same Japanese textbooks. Both are high intermediate language learners.

Structure of their digital story

Pair 7 (Rena/Rita) created a digital story about the coffee culture in Australia by comparing it to the beverage culture in Japan. They constructed their story using three sources; 1) first-hand experiences of the coffee culture in Australia; 2) information found on websites; and 3) results of an online survey of their Japanese friends. Their story comprises four sections;

1) introduction; 2) coffee culture in Australia; 3) beverage culture in Australia and Japan; and 4) conclusion. Their digital story can be watched at: https://www.youtube.com/watch?time_continue=151&v=EIJ9JwHHTwY

Task procedures

Although Pair 7 (Rena/Rita) developed their story together, Rena voluntarily completed the first half of their script by herself while Rita was interviewed by this researcher. After Rita returned to a group-study room we had sessions in which Rena read the script aloud to Rita. However, the pair started to write the latter half of their script without clarifying what stories they were going to write. As the result, Rita kept providing irrelevant suggestions from Rena's perspective regarding the project objective. Therefore, Rena decided to take control of the writing task in the middle of the writing stage. Excluded from the writing task, Rita sought to find relevant information for Rena by searching online resources. However, Rita increased her contribution to the project during the modifying stage by researching the topic on the Internet and by developing her suggestions prior to attending the revision session. Details of their task procedures are presented in Appendix 24.

5.2.9 Summary of the seven projects and the task procedures

To sum up, the seven pairs in this study developed digital stories on different topics and with different structures applying task procedures according to their interests and preferences. Table 5.7 provides a summary of their projects and the task procedures they used. In Section 5.3, I compare the characteristics of the four interaction patterns developed by the seven pairs while participating in the collaborative digital storytelling projects.

Table 5.7: The seven projects and the task procedures

Pair	**Pair 1 (Tessie/Yujin)**	**Pair 2 (Kasumi/Sky)**	**Pair 3 (Sherry/Stephanie)**	**Pair 4 (Brian/Po)**
Proficiency level	Tessie (low intermediate) Yujin (intermediate)	Kasumi (intermediate) Sky (intermediate)	Sherry (advanced) Stephanie (low intermediate)	Brian (high intermediate) Po (advanced)
Topic	Japanese traditional and Anime festivals	Experiences to live and study in Australia	Japanese culture which audience can experienced in Sydney	Experiences to live and study in Australia
Structure of their digital story	1. Introduction 2. Traditional Japanese festival 3. SMASH! 4. Conclusion	1. Introduction 2. *Tasumi*'s story 3. *Ayumi*'s story 4. Conclusion	1. Introduction 2. Food and shopping 3. Culture and language 4. Conclusion	1. Introduction 2. Culture shock experiences in Australia 3. University life in an Australian university 4. Conclusion

Pair	**Pair 5 (Lucie/Yuki)**	**Pair 6 (Jiyoung/Walter)**	**Pair 7 (Rita/Rena)**
Level of proficiency	Lucie (advanced) Yuki (advanced)	Jiyoung (advanced) Walter (advance)	Rita (high intermediate) Rena (high intermediate)
Topic	Experiences to live and study in Japan	Multi-culture in Sydney	Coffee culture in Australia and Japan
Structure of their digital story	1. Introduction 2. Spring 3. Summer 4. Autumn 5. Winter 6. Conclusion	1. Introduction 2. People 3. Food 4. Leisure 5. Conclusion	1. Introduction 2. Coffee culture in Australia 3. Beverage culture in Australia and Japan 4. Conclusion

5.3 Patterns of four interactions

This study identified four patterns of peer interactions developed by the seven pairs of Japanese language learners during collaborative digital storytelling projects: 1) division of labour; 2) collaborative storytelling; 3) collaborative knowledge constructions; and 4) limited spoken interactions. The four patterns are discussed in this order throughout this section. To code the task and role allocations in each production stage, the coding categories presented in Table 5.8 were used:

Table 5.8: Coding categories for task and role allocation

Coding categories	Descriptions
Pattern A: the same task and the same role	Each participant works on the same part of their tasks by playing in the same role
Pattern B: the same task and the different roles	Each participant works on the same task but plays different roles
Pattern C: different tasks and the same role	Each participant works on different tasks by playing the same role
Pattern D: different tasks and different roles	Each participant works on different tasks by playing different roles.

5.3.1 Pattern 1: Division of labour

The salient characteristic of Pattern 1 is the 'division of the tasks and roles'. In manifesting Pattern 1, the pairs divided their tasks and roles so that each participant could complete different parts of the tasks at the same time or at a time convenient to them. Pattern 1 occurred the most frequently among the seven pairs during this project.

Four pairs (Pairs 1-4) engaged in Pattern 1 (division of labour) during different production stages. Table 5.9 provides an overview of their task and role allocations during the three production stages:

Table 5.9: A summary of task and role allocation by pairs manifested Pattern 1

	1. Develop their story	2. Write their script	3. Modify their script
Pair 1 Tessie/Yujin	C	Home[15]: C During session: D	1) Script Tessie has written at home: D 2) Script except 1 and 3: C 3) Conclusion: B
Pair 2 Kasumi/Sky	A	English[16]= D Japanese= C	B
Pair 3 Sherry/ Stephanie	A	English[17]= B Japanese =D	D
Pair 4 Brian/Po	A	D	D

As seen in Table 5.9, the division of task pattern was particularly notable during the writing and modifying stages. All four pairs completed the writing task in Japanese by dividing up the task, despite some variations in role allocation. For example, Pairs 1, 3 and 4 developed 'Pattern D' (different tasks and different roles) to complete the Japanese script. They divided the writing tasks and the more proficient language learners had additional roles to write and edit the sentences written by the less proficient language learners to provide language assistance to them. Only pair 2 (Kasumi/Sky) displayed 'Pattern C' (different tasks and the same role) as both participants wrote different parts of the script by playing a role as 'a writer' at the same time without interrupting each other.

Pairs 2 and 3 began the process by writing an English script, but they allocated the tasks and roles in different ways. Pair 3 (Sherry/Stephanie) developed an English script together by playing different roles. They developed 'Pattern B' (the same task and different roles) as evidenced in the way Stephanie took on the role to narrate an English script and with Sherry typing up the script while making slight modifications to Stephanie's suggestions. Pair 2

[15] Pair 1 (Tessie/Yujin) divided their writing section in half, and arranged to complete their own section at home. They completed their remaining sections during the writing session.
[16] Kasumi (Pair 2) wrote the English script at home based on interviews conducted by Sky.
[17] Pair 3 (Sherry/Stephanie) wrote the English script together, and wrote different parts of the Japanese script at the same time using Google Docs.

(Kasumi/Sky) also divided the tasks and roles between each participant. The pair showed 'Pattern D' (different tasks and different roles) as evidenced in Sky's role as 'interviewer' of Japanese students and Kasumi's role as 'writer' of an English script based on the interviews.

Division of labour (Pattern 1) was also commonly observed among the pairs during the modifying stages. Pairs 1, 3 and 4 displayed 'Pattern D' (different tasks and different roles) as they allocated the revision task to more proficient participants. Being of higher Japanese language proficiency, the more proficient participants in Pairs 1, 3 and 4 (Yujin, Sherry and Po, respectively) revised their scripts by accepting the additional role of 'editor'. However, I coded the modifying stage by Pair 2 (Kasumi/Sky) who allocated time to provide feedback to each other as 'Pattern B' (the same task and different roles) due to their unequal contributions to the revision process. Sky provided only two suggestions to Kasumi; whereas Kasumi provided 16 suggestions to Sky.

Thus, Pattern 1 (division of labour) was frequently observed by the four pairs during the writing and modifying stages of the project. However, three of the four pairs (Pairs 2-4) chose to work on the same part of the task together during the story development stage. Pairs 2-4 developed 'Pattern A' (the same task and the same role) by discussing and developing their story together; whereas only Pair 1 (Tessie/Yujin) manifested 'Pattern C' (different tasks and the same role) by developing their story individually when searching online for relevant information outside of the session.

Even though Pairs 1-4 displayed 'Pattern 1' (division of labour), there was a significant difference in the number of TMEs and LREs discussed by each pair during the three production stages. Pair 4 (Brian/Po) manifested the most active engagement in discussing TMEs and LREs among the four pairs by developing their story together and by frequently interrupting each other using the real-time monitoring function of Google Docs during the writing stages. Table 5.10 shows the distribution of TMEs and LREs by the four pairs during the three production

stages. As Table 5.10 suggests, Pair 4 (Brian/Po) initiated 261 TMEs and 25 LREs in total. Although the other three pairs show a large gap in the number of TMEs ranging from 44 (Pair 1) to 151 (Pair 3), they produced a similar level of LREs ranging from 7 (Pair 3) to 22 (Pair 2).

Table 5.10: Distribution of TMEs and LREs by the four pairs

(E=English script, J=Japanese script)

		1. Develop a story		**2. Write a script**		**3. Modify the script[18]**		**Total of TMEs and LREs**	
Patterns	**Pair**	**TMEs**	**LREs**	**TMEs**	**LREs**	**TMEs**	**LREs**	**TMEs**	**LREs**
1. Division of labour	Pair 1 Tessie/Yujin	17	1	15	6	12	6	44	13
	Pair 2 Kasumi/Sky	52	0	E=0 J=1	E=0 J=0	E=0 J=5	E=0 J=22	58	22
	Pair 3 Sherry/ Stephanie	88	0	E= 48 J=8	E=0 J=5	E=0 J=7	E=0 J=2	151	7
	Pair 4 Brian/Po[19]	190	12	71	13	0	0	261	25

[18] After Pair 4 received feedback in Japanese, they discussed how to revise their script together. However, I did not include the data in Table 5.8 as I requested the procedure for Pairs 4 and 7 only who joined my study in Phase 2.

[19] I included the number of TMEs and LREs Po initiated to revise sentences written by Brian in the writing stage because Po initiated the discussions while Brian was still writing different lines. I excluded the number of TMEs and LREs they produced while discussing how to integrate feedback from Japanese from data because the participants in Phase 1 did not have the same session.

5.3.2 Pattern 2: Collaborative storytelling

Pattern 2 (collaborative storytelling) shows a similar outcome to Pattern 1 (division of labour) in terms of task division. However, what distinguishes Pattern 2 (collaborative storytelling) from Pattern 1 (division of tasks) is the nature of the active interactions by the pairs to develop their story structures. Only Pair 5 (Lucie/Yuki) developed this pattern. Table 5.11 shows how they divided their tasks and roles during three production stages.

Table5.11: Task and role allocation by Pair 5 (Lucie/Yuki)

Stages	**1. Develop their story**	**2. Write their script**	**3. Modify their script**
Task and role allocation	A & C	C	English= B Japanese= C

During the story development stage, Pair 5 (Lucie/Yuki) showed two patterns: Pattern A and Pattern C. They manifested 'Pattern C' (different tasks and the same role) by developing their story individually while playing the same role as 'a story creator'. Pair 5 manifested 'Pattern A' (the same task and the same role) by sharing their individually developed stories with a peer as 'a story creator'. The writing stage for both the English and Japanese scripts indicated 'Patten C' in the way they wrote different parts of their script as 'a writer'. The pair showed different patterns when modifying the English and Japanese scripts. They developed 'Pattern B' (the same task and different task) while modifying their English script as they discussed how to revise as 'an editor'. Yuki also took on an additional role as 'a typist'. However, they developed 'Pattern C' (different tasks and the same role) when they modified the Japanese scrip after revising it themselves as 'an editor' at home.

The distinctive features of Pattern 2 are the long-time investment in discussing the story structure and the active discussion of TMEs during the story development stage. Table 5.12 summarises the length of time each pair invested into the development their story per session. As Table 5.12 shows, Pair 5 (Lucie/Yuki) developed 272 minutes to the development of their story, which was the largest amount of time among the seven pairs.

Table 5.12: Length of time each pair invested to develop their story

		Session 1	**Session 2**	**Session 3**	**Total**
1. Division of labour	Pair 1 Tessie /Yujin	1)10 minutes 2) Research topic individually			10 minutes + develop story individually at home
	Pair 2 Kasumi /Sky	1) Discussed outside the session 2) 14 minutes 3) 29 minutes to develop interview questions			43 minutes
	Pair 3 Sherry/ Stephanie	12 minutes	32 minutes		44 minutes
	Pair 4 Brian /Po	1) 74 minutes to discuss story 2) 8 minutes to develop interview questions	66 minutes	16 minutes	164 minutes
2. Collaborative storytelling	Pair 5 Lucie /Yuki	1) 13 minutes for brainstorming 2) 109 minutes for discussing topic	2) 150 minutes		272 minutes
3. Collaborative knowledge constructions	Pair 6 Jiyoung/ Walter	18 minutes	102 minutes	7 minutes	127 minutes
4. Limited spoken interactions	Pair 7 Rena/ Rita	1) 30 minutes for story development 2) 9 minutes to develop interview questions			39 minutes

Pair 5's active engagement in story development is evidenced in the number of TMEs they discussed during the story development stage. Table 5.13 provides an overview of the TMEs and the LREs initiated by Pair 5 during each production stage. Table 5.14 shows distribution of TMEs discussed by the seven pairs.

Table 5.13: Distribution of TMEs and LREs by Pair 5 (Lucie/Yuki)

	1. Develop their story		**2. Write their script**		**3. Modify their script**		**Total number**	
	TMEs	**LREs**	**TMEs**	**LREs**	**TMEs**	**LREs**	**TMEs**	**LREs**
Pair 5 Lucie/Yuki [20]	429	9	E=0 J=5	E=0 J=19	E= 102 J=0	E=0 J=0	536	28

Table 5.14: Distribution of TMEs among the seven pairs (Total)

Pattern	**Pattern 1**				**Pattern 2**	**Pattern 3**	**Pattern 4**
Pair	**Pair 1 (Tessie /Yujin)**	**Pair 2 (Kasumi/ Sky)**	**Pair 3 (Sherry /Stephanie)**	**Pair 4 (Brian/ Po)**	**Pair 5 (Lucie/ Yuki)**	**Pair 6 (Jiyoung/Walter)**	**Pair 7 (Rita/Rena)**
Number of TMEs produced by each par	44	58	151	261	536	384	47

[20] The data collection for Pair 5 was conducted under different context. The other six pairs were asked to resolve their language problems using resources except for the researcher. However, I answered Japanese related questions by Pair 5 as Yuki's object of the project is to improve her Japanese by asking Japanese expressions to Japanese. Another reason was I have collected data from four pairs to understand how the participants resolve their language problems only by using their linguistic knowledge and online resources by the time I was collecting data from Pair 5. As the result, Pair 5 addressed 17 out of 28 LREs to the researcher. Three LREs addressed to the researcher were unresolved.

As Table 5.13 indicates, Pair 5 initiated as many as 429 TMEs during the story development stage, which led the pair to produce the largest number of TMEs (n=536) among the seven pairs (Table 5.14). However, the pair manifested less active interactions to discuss LREs with peers to engage in language learning; 28 LREs in total (Table 5.13).

5.3.3 Pattern 3: Collaborative knowledge constructions

The distinctive feature of Pattern 3 (collaborative knowledge constructions) is that the pair work on the same part of the task together throughout the project except for the video editing task. Pattern 3 is also characterised by active interactions to construct knowledge of Japanese and to jointly decide the task procedures. Only one pair, Pair 6 (Jiyoung/Walter), demonstrated the characteristics of Pattern 3. Pair 6 (Jiyoung/Walter) continued to work on the same part of the task throughout the project, choosing not to divide the workload. Table 5.15 shows how Pair 6 (Jiyoung/Walter) has allocated the tasks and roles during the three production stages.

Table 5.15: Task and role allocation by Pair 6 (Jiyoung/Walter)

Stages	**1. Develop their story**	**2. Write their script**	**3. Modify their script**
Task and role allocation	B	B	B

As seen in Table 5.15, Pair 6 (Jiyoung/Walter) displayed 'Pattern B' (the same task and different roles) in all production stages. To develop their story, both participants played the same role as 'story creator'. However, Jiyoung was more proficient in typing than Walter and subsequently took on the additional role as 'a typist'. Walter took on the additional role to think about their project as 'a whole'. Similarly, both participants played the role of 'writer' by providing suggestions during the writing and modifying stages. Because Jiyoung helped to type

the scripts for Walter – who has limited typing literacy in Japanese, the writing and modifying stages were also coded as 'Pattern B' (the same task and different roles).

Pair 6 (Jiyoung/Walter) demonstrated active discussion of both TMEs and LREs throughout the project. Table 5.16 indicates the distribution of TMEs and LREs during the three production stages by Pair 6. It shows Pair 6, who continued to work on the same tasks throughout their project, initiated over 100 TMEs and 25 or more LREs during every production stage. The results show Pair 6 (Jiyoung/Walter) developed the largest number of LREs (Table 5.17) and the second largest number of TMEs (Table 5.14) among the seven pairs.

Table 5.16: Distribution of TMEs and LREs by Pair 6 (Jiyoung/Walter)

	1. Develop their story		**2. Write their script**		**3, Modify their script**		**Total number**	
	TMEs	**LREs**	**TMEs**	**LREs**	**TMEs**	**LREs**	**TMEs**	**LREs**
Pair 6 Jiyoung/Walter	136	25	149	43	99	25	384	93

Table 5.17: Distribution of LREs among the seven pairs

Pattern	**Pattern 1**				**Pattern 2**	**Pattern 3**	**Pattern 4**
Pair	**Pair 1 (Tessie /Yujin)**	**Pair 2 (Kasumi/ Sky)**	**Pair 3 (Sherry /Stephanie)**	**Pair 4 (Brian/ Po)**	**Pair 5 (Lucie/ Yuki)**	**Pair 6 (Jiyoung/Walter)**	**Pair 7 (Rita/Rena)**
Number of TMEs produced by each par	13	22	7	25	28	93	4

5.3.4 Pattern 4: Limited spoken interactions

The salient characteristics of Pattern 4 (limited spoken interactions) are to have fewer spoken interactions to discuss task procedures and the language problems encountered during the project. Only Pair 7 (Rena/Rita) manifested the characteristics of Pattern 4. Table 5.18 shows how Pair 7 (Rena/Rita) allocated the tasks and roles during the three production stages.

Table 5.18: Task and role allocation by Pair 7 (Rena/Rita)

Stages	**1. Develop their story**	**2. Write their script**	**3. Modify their script**
Task and role allocation	A	Before session=D During session= B	B

It shows Pair 7 (Rena/Rita) developed 'Pattern A' (the same task and the same role) during the story development stage by discussing the story together. Thus, they both played the role of 'story creator'. However, the pair manifested two patterns during the writing stages as they completed the script in different ways: 1) writing by one writer outside the session; 2) writing together by playing different roles during the writing session. Pair 7 displayed 'Pattern D' (different tasks and different roles) when Rena voluntarily competed the first half of the script by herself as 'a sole writer'. This was while waiting Rita was interviewed by this researcher before the writing session. 'Pattern B' (the same task and different roles) was assigned to the writing stage during the session because both participants played different roles while writing the latter half of the script. Rena took control of the writing process by deciding what to write and by using her laptop to write the script. Rita provided suggestions and searched for relevant information on online resources. The modifying stage was also coded as 'Pattern B' (the same task and different roles) because Rita provided suggestions and Rena typed the suggestions into the revised script.

Despite the arrangement to work together during most of the production stages, Pair 7 (Rena/Rita) manifested their limited engagement in discussing TMEs and LREs during the three production stages. Table 5.19 presents the number of TMEs and LREs initiated by Pair 7 during these stages. It shows the pair initiated only 47 TMEs and four LREs during the three production stages despite their work arrangement to work on the same part of the tasks except for the first half of their writing task.

Table 5.19: Distribution of TMEs and LREs by Pair 7 (Rena/Rita)

	1. Develop their story		**2. Write their script**		**3. Modify their script**		**Total number**	
	TMEs	**LREs**	**TMEs**	**LREs**	**TMEs**	**LREs**	**TMEs**	**LREs**
Pair 7 Rena/Rita[21]	17	0	18	2	12	2	47	4

5.3.5 Summarising the four patterns of peer interactions

In this section, I distinguish between the patterns of peer interaction developed by the seven pairs by focusing on task and role allocation, and the distribution of TMEs and LREs in the three production stages. The results showed four interaction patterns were developed by the seven pairs during the project: 1) division of labour; 2) collaborative storytelling; 3) collaborative knowledge constructions; and 4) limited spoken communication. The characteristics of each interaction pattern are summarised as Table 5.20.

[21] TMEs and LREs produced while Pair 7 were discussing how to incorporate feedback from Rita's Japanese were excluded as the other pairs who participated in Phase 1 (Semester 1, 2016) did not have the session.

Table 5.20: Characteristics of four interaction patterns

Pattern	**Pattern 1 (Division of labour)**	**Pattern 2 (Collaborative storytelling)**	**Pattern 3 (Collaborative knowledge constructions)**	**Pattern 4 (Limited spoken interactions)**
Pair	Pair 1-4	Pair 5	Pair 6	Pair 7
Task and role allocation	Divided tasks and roles either in all stages or some stages.	Divided tasks either in all stages. A participant also played additional role to type.	Worked together throughout their project without dividing their tasks except for the video editing task. A participant also played additional role to type.	Worked together throughout their project except for first half of writing tasks Divided their roles.
TMEs	Showed variations ranging from 44 TMEs to 261 TMEs.	Invested longest time to discuss TMEs during story development stage Actively discussed TMEs during story development stage (n=429) Produced the largest TMEs (n=536) in total	Actively discussed TMEs in all production stages. Produced the second largest TMEs (n=384).	Produce second least TMEs (n=47)
LREs	Produced from 7-25 LREs	Produced 28 LREs	Actively discussed LREs in all production stages. Produced the largest LREs (n=93).	Produced the least LREs (n=4).

As seen in Table 5.20, the seven pairs developed four interaction patterns during collaborative digital storytelling projects; 1) division of labour; 2) collaborative storytelling; 3) collaborative knowledge constructions; and 4) limited spoken interactions. The most frequently observed interaction pattern was Pattern 1 (division of labour). Four of the seven pairs displayed this pattern. Patterns 2-4 were developed by one pair for each. Pattern 1 (division of labour), the most common pattern during this project, is characterised by division of tasks and roles, and fewer interactions with peers to discuss LREs for language learning. Although Pattern 2 (collaborative storytelling) also involved the division of tasks and roles similar to Pattern 1, the pairs demonstrated their active discussion of TMEs during story development. In addition to task and role division, Pattern 4 (limited spoken interactions) manifested fewer spoken interactions with peers to discuss TMEs and LREs. Only Pair 6, displaying Pattern 3 (collaborative knowledge constructions), chose to work on the same part of the tasks throughout the project, excepting the video editing task.

Thus, the findings discussed in this section revealed widespread use of task and role allocation. The number of TMEs and LREs each pair discussed showed a large variation. The results may be partly due to their task and role allocation. Whereas Pair 6 who continued to work on the same part of their tasks produced a large number of TMEs and LREs, whereas Pair 1 who divided their tasks in all production stages produced very few TMES and LREs. To summarise the discussion in this section, Figure 5.1 was developed to distinguish between the patterns of peer interactions by the seven pairs during collaborative digital storytelling projects.

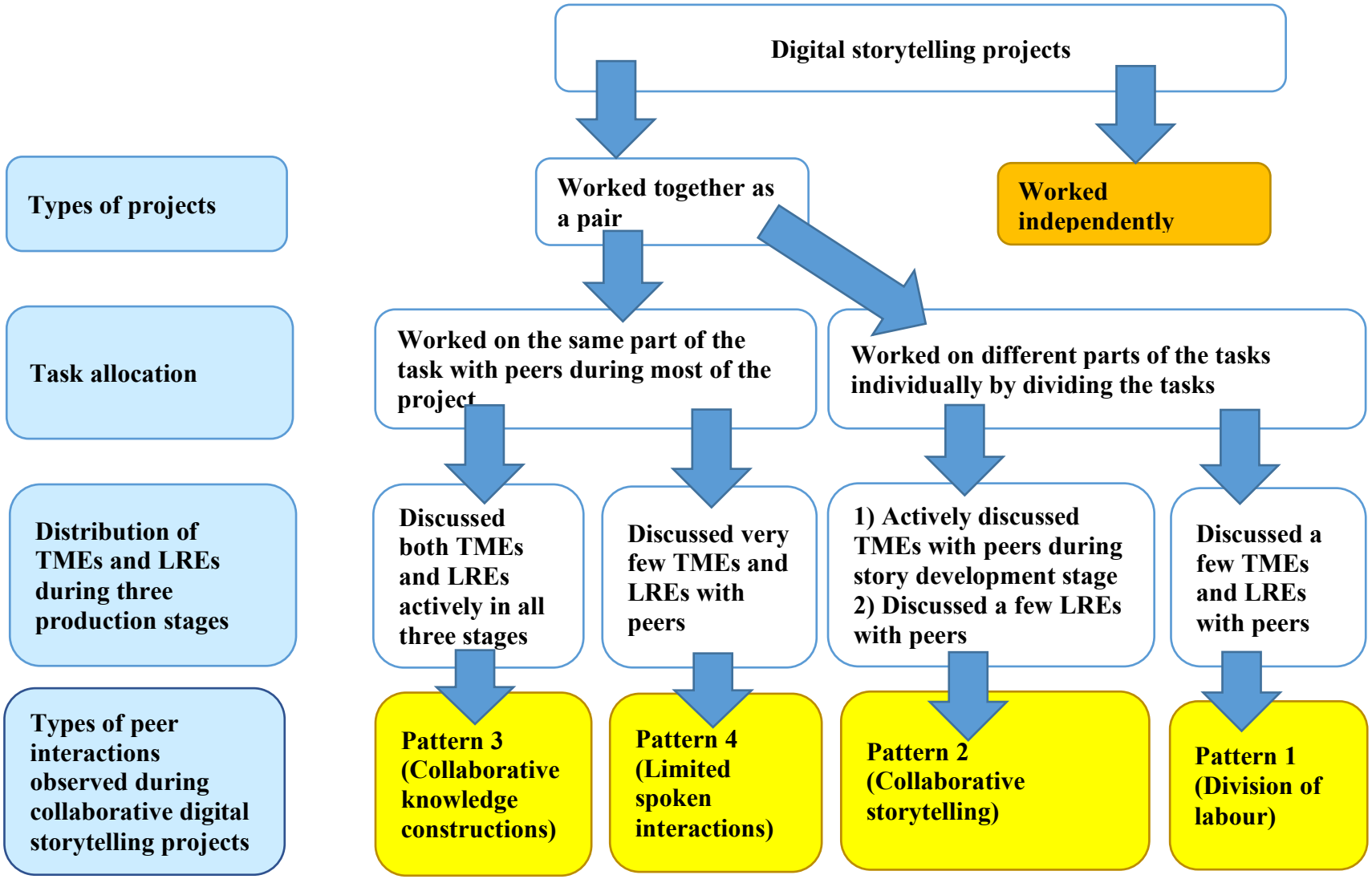


Figure 5.1: Distinguishing between the patterns of peer interactions

Although digital storytelling projects can be implemented as 'individual learning tasks', focus in this study is on digital storytelling projects in which participants work together (see the discussion in Chapter 2). The first step towards distinguishing the patterns of peer interactions during the project was to identify whether 'participants worked together as a pair during most of their project'. If so, the second step was to examine the distribution of TMEs and LREs discussed by the pair during the three production stages. If the pair discussed both TMEs and LREs actively in all three stages, their interaction pattern was classified as 'Pattern 3' (collaborative knowledge constructions). If the pair engaged in only a few interactions to discuss both TMEs and LREs, their interactions were labelled as 'Pattern 4' (limited spoken interactions).

We return to the previous step in order to distinguish patterns of peer interactions developed by the pairs who 'worked on the different parts of their tasks individually by dividing their tasks'. If the pair actively discussed TMEs particularly during the story development stage, but they discussed only a few LREs, the interaction was considered as 'Pattern 2' (collaborative storytelling). If the pair discussed fewer TMEs and LREs, their interaction was classified as 'Pattern 1' (division of labour).

In sum up, this section distinguished four patterns of peer interactions developed by the seven pairs during a long-term collaborative learning project by analysing their task and role allocation, and the distribution of TMEs and LREs during the three production stages. The description of the overall characteristics of each interaction pattern showed how each pair allocated their tasks and roles, and the extent to which each pair discussed TMEs and LREs in each production stage. The next section compares the task management characteristics per interaction pattern, with the characteristics of the interactions for language learning discussed in Chapter 6 and 7.

5.4 Interactions for task management

The findings of this study showed that the seven participant pairs developed different quantitative and qualitative TME characteristics during their digital storytelling projects. This section compares the TME characteristics discussed by the seven pairs per interaction pattern. The characteristics of task management for each pattern are discussed in the following order; 1) Pattern 1 (division of labour); 2) Pattern 2 (collaborative storytelling); 3) Pattern 3 (collaborative knowledge constructions); and 4) Pattern 4 (limited spoken interactions). To help the reader to understand the different characteristics of task management, I first provide the distribution of TMEs during the three production stages. I then discuss the TME characteristics based on the qualitative analysis.

5.4.1 Task management by Pattern 1 (division of labour)

1) Distribution of Task Management Episodes

Pairs 1-4) developed Pattern 1 (division of labour) and showed a large discrepancy in the number of TMEs they discussed during the three production stages. Table 5.21 provides an overview of the TMEs the four pairs initiated in each production stage:

Table 5.21: An overview of TMEs produced by the four pair during each stage

Pair	**Pair 1 (Tessie /Yujin)**	**Pair 2 (Kasumi/ Sky)**	**Pair 3 (Sherry /Stephanie)**	**Pair 4 (Brian/ Po)**
1. Develop a story	17	52	88	190
2. Write a script	15	English=0 Japanese=1	English=48 Japanese=8	71
3. Modify their script	12	English=0 Japanese=5	English=0 Japanese=7	0
Total of TMEs during three production stages	44	58	151	261

As Table 5.19 shows, the number of TMEs discussed by the four pairs ranges from 44 to 261. Pair 4 (Brian/Po) demonstrated the most active engagement to discuss the task procedures among the four pairs (Pair 1-4) by producing the largest number of TMEs (n=261). Despite their division of the writing tasks, Pair 4 (Brian/Po) managed to interact with each other to consult on task procedures by monitoring each other's progress using the real-time monitoring function on Google Docs. Using this function, the pair initiated as much as 71 TMEs during the writing stage. Pair 3 (Sherry/Stephanie) also actively discussed TMEs (n=151 in total) by developing the story together and by writing an English script together. The pair had limited interactions to discuss TMEs although they were writing the Japanese script using Google Docs providing real-time monitoring function. They initiated only seven TMEs to discuss the task procedures while writing the different parts of the script synchronously using Google Docs. Pair 1 and Pair 2 divided their writing tasks and produced very few TMEs during the writing stage, 15 and one, respectively.

2) Characteristics of Task Management Episodes

Qualitative analysis of the TMEs discussed by Pairs 1-4 as part of Pattern 1 (division of labour) showed three distinctive features: 1) negotiating task allocation; 2) negotiating role allocation; and 3) negotiating working platforms to divide tasks.

1. Negotiating task allocation

In developing Pattern 1 (division of labour), Pairs 1-4 provided explicit instructions for task division. Excerpt 1 (from Pair 1) exemplifies how Yujin and Tessie negotiated the task allocation process. Yujin initiated the process just before she and Tessie started to the writing tasks. Despite arrangement to complete the writing own section at home, Tessie could not complete all her section due to the need for her to prepare for her exams. Tessie's failure to

complete her task created a context in which the task division lines became blurred. Yujin could have chosen either to work together to complete Tessie's section or to work on different sections at the same time. Therefore, as shown in Excerpt 1, Yujin instructed Tessie to complete her remaining section by herself:

Excerpt 1

1 Yujin: You just workout your script, and I work on transition.

2 Tessie: OK. ((Nodded.))

((The pair opened their personal laptops and started to write their section individually.))

Despite Yujin's instructions regarding the task division, during 11 minutes of writing Tessie interrupted Yujin 14 times to consult on task procedures and to seek language assistance. As a result, the lines dividing the task became blurred. Excerpt 2 below, outlines Tessie's further negotiation on task allocation regarding whether they should continue to work on their tasks separately:

Excerpt 2

1 Tessie: ((Tessie interrupts Yujin who is writing her section)) Do we do things separately or together?

2 Yujin: Amm. What do you mean by that?

3 Tessie: Like ((think by herself for seven seconds)) Amm. OK.

((They went back to write own section individually.))

Because Yujin was not sure of the intention behind Tessie's question in Turn 1, she requested clarification in her question in Turn 2. After thinking silently for seven seconds, Tessie decided to complete the remaining section of the task by herself instead of clarifying for Yujin her question in Turn 1. Thus, Excerpts 1 and 2 show that the lines of task division become blurred in contexts where one participant is not able to complete all the allocated tasks or does not have enough linguistic resources to complete the task independently. In such contexts, participants can further negotiate the division of the tasks and how they should be completed.

2. Negotiating role allocation

When developing Pattern 1 (division of labour), the pair group not only negotiates how the task is to be divided, but also the role allocation to complete the tasks. For example, Pair 3 (Sherry/Stephanie) comprised participants who differed significantly in their Japanese language proficiency skills. Nonetheless, they negotiated their roles in the writing task just before starting to write their script. Excerpt 3 exemplifies how a pair with such a proficiency gap negotiates their roles in the project, with Stephanie, the less proficient participant, initiating the discussion:

Excerpt 3

1 Stephanie: I guess we can go by what you confident as you have more Japanese.

2 Sherry: I can twist. Give me your best English you wanna say and I end up changing it.

Aware of the large Japanese language proficiency gap between herself and Sherry, Stephanie suggested that, as an advanced learner of Japanese, Sherry should choose her preferred way to write the script. In Turn 2, Sherry asked Stephanie to provide English

sentences as ‘a narrator’, and Sherry would then type up Stephanie’s suggestions making slight modifications as required. Thus, negotiating the roles in their writing task led Pair 3 (Sherry/Stephanie) to complete their English script by playing different roles.

3. Negotiating working platforms to divide writing tasks

In Pair 3 (Stephanie/Sherry), Stephanie negotiated not only her role in the writing task but also their working platform used to write their script. Excerpt 4 is an example of how Stephanie (a less proficient learner of Japanese) negotiated to use Google Docs with Sherry (a advanced learner of Japanese) in order to increase her participation in the writing task despite her limited Japanese. The dialogue occurred when Stephanie suggested Sherry to write their Japanese script using Google Docs as it allows multiple users to work on the same documents synchronously or asynchronously.

Shortly after Sherry and Stephanie had started to write their Japanese script, they worked together on the same part of the writing task using Sherry’s laptop as the primary working platform (See Image 5.1). Stephanie was monitoring how Sherry rewrote the English script in Japanese by looking at Sherry’s laptop.

Image 5.1: Stephanie (right) is monitoring what Sherry (left) is writing

Assuming that they were writing the Japanese script together, Sherry talked to Stephanie in Turn 1 to consult with her on how to express '多文化社会'(multicultural society) in English. While looking at Sherry's laptop, Stephanie requested Sherry to share the Japanese script using Google Doc in Turn 2 so that they both could write different parts of the scrip at the same time.

Excerpt 4

1. Sherry: シドニーという町は ((silent for 14 seconds)). How do we say 多文化社会

A city called Sydney ((silent for 14 seconds)). How do we say multicultural society (in English?)

2 Stephanie: Can we share (the link of) Google Document?

3. Sherry: ((Shared their Japanese script by using Google Docs)) I did.

After Sherry shared the link with Stephanie, they started to rewrite different parts of the script synchronously using the function which allow multiple users to edit the same document synchronously or asynchronously (See Image 5.2).

Image 5.2: The pair started to write different parts of their script at the same time

Excerpts 1-4 suggest that negotiating the task and role allocations, and the working platforms to be used, is commonly practiced by pairs developing Pattern 1 (division of labour). Pairs 1-4 developed Pattern 1 using 'division of labour' to complete the project efficiently; namely, to work on different parts of the tasks at the same time or by completing the same task playing different roles.

5.4.2 Task management by Pattern 2 (collaborative storytelling)

1) Distribution of Task Management Episodes

Pattern 2 (collaborative storytelling) was developed only by Pair 5 (Lucie/Yuki). The Pair demonstrated active interactions to develop their story. Table 5.22 shows the distribution of TMEs initiated by the seven pairs during the three production stages. Particularly, Pair 5 (Lucie/Yuki) initiated as many as 429 TMEs during the story development stage, which led the pair to initiate the largest number of TMEs during the project among the seven pairs. However, the pair initiated only five TMEs during the writing stage. In other words, they did not consult with each other on the tasks procedures when writing the Japanese script.

Table 5.22: Distribution of TMEs by the seven pairs

Pattern	**Pattern 1**				**Pattern 2**	**Pattern 3**	**Pattern 4**
Pair	**Pair 1 (Tessie /Yujin)**	**Pair 2 (Kasumi/ Sky)**	**Pair 3 (Sherry /Stephanie)**	**Pair 4 (Brian/ Po)**	**Pair 5 (Lucie/ Yuki)**	**Pair 6 (Jiyoung /Walter)**	**Pair 7 (Rita/ Rena)**
1. Develop a story	17	52	88	190	429	136	17
2. Write their script	15	English=0 Japanese=1	English=48 Japanese=8	71	English=0 Japanese=5	149	18
3. Modify their script	12	English=0 Japanese=5	English=0 Japanese=7	0	English=102 Japanese=0	99	12
Total	44	58	151	261	536	384	47

2) Characteristics of Task Management Episodes

The TMEs initiated by Pair 5 (Lucie/Yuki) displayed Pattern 2 (collaborative storytelling) characteristics in their active discussion of the story structure during the story development stage. Table 5.23 shows the distribution of TMEs sub-coded as 'suggest story structure' during the three production stages by the seven pairs. Table 5.21 shows that among the seven pairs, Pair 5 (Lucie/Yuki) most actively discussed TMEs (suggest story structure), producing as many as 123 TMEs to suggest story structures during story development stage.

Table 5.23: Distribution of TMEs (suggest story structure) by the seven pairs

Pattern	**Pattern 1**				**Pattern 2**	**Pattern 3**	**Pattern 4**
Pair	**Pair 1 (Tessie /Yujin)**	**Pair 2 (Kasumi/ Sky)**	**Pair 3 (Sherry /Stephanie)**	**Pair 4 (Brian/ Po)**	**Pair 5 (Lucie/ Yuki)**	**Pair 6 (Jiyoung/Walter)**	**Pair 7 (Rita/Rena)**
1. Develop their story	5	2	16	28	123	45	4
2. Write their script	1	0	0	5	0	13	1
3. Modify their script	1	0	0	0	English =22 Japanese =0	2	1
Total	7	2	16	33	145	60	5

Excerpt 5 presented below shows the active discussion of story structure during the story development stage by Pair 5 (Lucie/Yuki). The discussion occurred when the participants were considering how best to connect the episodes they had developed individually to form a coherent story. As shown in Excerpt 5, the main problem they encountered was related to their different preferences for a story structure. As a person who aspired to work in the animation industry, and having read many storytelling books, Lucie preferred to develop the pair's story using an explicit structure; namely, 'start, struggle and resolution'. On the other hand, Yuki perceived their episodes as 'a diary entry', and preferred to structure the individual episodes as 'a slice of their life' as experienced in Japan without imposing a rigid structure or theme onto them.

Excerpt 5

1. Lucie: So is the theme (of our story) two different individual experiences?

2. Yuki: Yeah. How can we tie them together?

3. Lucie: I just think we should have kind of a theme to tie them together.

4. Yuki: Change, personal growth, seasons.

5. Lucie: So (if we make our story without having a theme) at the end what we are (going to make a story) like oh that's cool. Great exchange. Our photo has changed.

6. Yuki: Does we need to have it[a theme]? Cause this is kind of reflection diary entry things. If we make, does everything need to have meaning of stories? A story can have a kind of a slice of life in the ending.

7. Lucie: I guess so. But how we are going to end?

8. Yuki: Through this myself became better. Yeah. I don't see anything wrong with (creating a digital story with a slice of moments). It might be bit boring for you.

9. Lucie: I am just wondering why viewers are interested in our stories. Are they interested in because oh Japan. You can do this. But I think we have to be ourselves, really. Oh I went to Japan. I don't want that.

10. Yuki: How can we feel be interested in big change of someone else unless we tell cool places to see?

11. Lucie: Do you remember the video we watched? A girl's video. This is my experiences. I guess we were interested in because she went to japan as an exchange (student).

12. Yuki: Yeah, yeah. But this is for Japanese audience thought. They might be interested in what is foreigners' perspectives.

As seen in Turns 1 and 3 in Excerpt 5, Lucie pointed out that the individual episodes did not have 'a theme' to connect them together as 'a story'. Despite Lucie's comments, Yuki asserted in Turn 6 that they do not need to impose an explicit story structure to connect the individual episodes as their stories are like 'a reflective diary entry'. In Turn 9, Lucie still expressed her concern about being able to interest the audience with a story that did not have an explicit theme. Responding to Lucie's concern, Yuki stressed in Turn 10 that structuring their story with a theme was not enough to interest the audience, and that they should also include details about interesting locations in Japan. Lucie agreed with Yuki's comment by pointing out that the video they watched together was interesting because the storyteller shared her unique experiences of living in Japan as an exchange student, despite the lack of an explicit theme in the story.

Thus, Excerpt 5 demonstrates the active negotiation process by Pair 5 (Lucie/Yuki) on how to structure their story given their different preferences. After discussing the options several times, the pair finally compromised on a structure; that is, to loosely connect the individual episodes as 'a story' using the 'four seasons' rather than imposing an explicit theme.

5.4.3 Task management by Pattern 3 (collaborative storytelling)

1) Distribution of Task Management Episodes

Pair 6 (Jiyoung/Walter), developed Pattern 3 (collaborative knowledge constructions) and maintained their active discussion of TMEs throughout the three production stages. Table 5.24 shows the distribution of TMEs discussed by the seven pairs during the three production stages. It indicates that Pair 6 (Jiyoung/Walter) constantly initiated 100 or more TMEs during each stage. This consequently led the pair to produce the second largest amount of TMEs during the three production stages among the seven pairs.

Table 5.24: Distribution of TMEs by the seven pairs

Pattern	**Pattern 1**				**Pattern 2**	**Pattern 3**	**Pattern 4**
Pair	**Pair 1 (Tessie /Yujin)**	**Pair 2 (Kasumi/ Sky)**	**Pair 3 (Sherry /Stephanie)**	**Pair 4 (Brian/ Po)**	**Pair 5 (Lucie/ Yuki)**	**Pair 6 (Jiyoung/Walter)**	**Pair 7 (Rita/Rena)**
1. Develop a story	17	52	88	190	429	136	17
2. Write their script	15	English=0 Japanese=1	English=48 Japanese=8	71	English=0 Japanese=5	149	18
3. Modify their script	12	English=0 Japanese=5	English=0 Japanese=7	0	English=102 Japanese=0	99	12
Total	44	58	151	261	536	384	47

2) Characteristics of Task Management Episodes

The TMEs discussed by Pair 6 (Jiyoung/Walter) displaying Pattern 3 (collaborative storytelling) have distinctive features including: 1) providing suggestions which build upon the peer's contributions; and 2) actively discussing sentence structure.

1. Provide suggestions which build upon the peer's contributions

The TMEs produced by Pair 6 (Jiyoung/Walter) where characterised by an attempt to 'provide suggestions which built upon their peer's contributions'. Excerpt 6 is an example of this pattern and was recorded while the pair was discussing how to structure their story for the second section: People[22].

[22] This section can be viewed at:
https://www.youtube.com/watch?time_continue=57&v=4H7c6MLfE1g
'マルチカルチャーのオーストラリア'(Multi-culture in Australia) (0:57-1:24)

Excerpt 6

1. Jiyoung: So we focus on introducing first Australian people, but this is more like background information.
2. Walter: How about introduce Aboriginal people? We want to introduce Aboriginal culture. You can add images of Aboriginal arts. You can put background music.
3. Jiyoung: Music can (be) change(d) in the middle.
4. Walter: Maybe typical '*didgeridoo'(*musical instrument*)* kind of images we can say
5. Jiyoung: We can try to say there are many types of people in Australia and in Sydney. For example, we can introduce specific type of people in chronological way. 'もともと'(originally) originally Aboriginal people, then Australians came, immigrants came, and Chinese came and bura bura bura. We can introduce in chronological way. Then in that way, many people came to Australia. We can say that.

In Turn 1, Jiyoung suggested to Walter that they introduce the First Australian as background information in the People section. This suggestion triggered a further suggestion from Walter in Turn 2 that they introduce Aboriginal culture by showing their music and images. To further develop Walter's suggestion in Turn 2, Jiyoung suggested that they change the music presentation in the middle of the story. Jiyoung's suggestion in Turn 3 prompted Walter to specify the type of music they could use in their digital story; '*didgeridoo'*(musical instrument). Their previous interactions then inspired Jiyoung in Turn 5 to suggest that they introduce the people to have come to Australia in a chronological way to represent the diversity

of people in Australia. Thus, by providing suggestions which build upon their peer's contributions, Pair 6 (Jiyoung/Walter) used peer's suggestions as opportunities to further substantiate the task procedures.

2. Active discussion of sentence structure

Another distinctive feature of the TMEs produced by Pair 6 (Jiyoung/Walter) is their active discussion of 'sentence structure'. The pair actively suggests new sentences to improve their script. They also actively suggest how to modify their sentences. Table 5.25 shows the distribution of TMEs initiated by the seven pairs to suggest new sentences or to suggest how to revise their sentences when writing and modifying their script. It reveals that Pair 6 (Jiyoung/Walter) were the most actively engaged in a discussion of sentence structure among the seven pairs. This pair initiated 59 TMEs during the writing stage and 39 TMEs during the modification stage to suggest new sentences or to suggest how to modify their sentences, respectively.

Table 5.25: The number of TMEs (suggest sentence structure) discussed by each pair

Pattern	**Pattern 1**				**Pattern 2**	**Pattern 3**	**Pattern 4**
Pair	**Pair 1 (Tessie /Yujin)**	**Pair 2 (Kasumi/ Sky)**	**Pair 3 (Sherry /Stephanie)**	**Pair 4 (Brian/ Po)**	**Pair 5 (Lucie/ Yuki)**	**Pair 6 (Jiyoung/Walter)**	**Pair 7 (Rita/Rena)**
2. Write their script	0	0	English= 13 Japanese =0	0	0	59	3
3. Modify their script	3	4	0	0	0	39	6
Total	3	4	13	0	0	98	9

Excerpt 7 is an example of the active discussion of 'sentence structure' by Pair 6 (Jiyoung/Walter) and took place when Jiyoung initiated a discussion about transition problems in their introduction[23]. The draft of their introduction discussed in Excerpt 7 is provided in the following page. Jiyoung is concerned about two transitions in their introduction: 1) the transition from icons in Sydney (Opera House and Harbour Bridge) to multiculturalism in Australia; and 2) the transition from Australia to Sydney as the main focus in their story is multiculturalism in Sydney:

A draft of introduction Pair 6 (Jiyoung/Walter) is discussing in Excerpt 7

1. あなたにとって、オーストラリアはどんな国ですか。

2. じつは、よくテレビで見かけるオペラハウスやハーバーブリッジみたいなその有名なところはオーストラリアのすべてではないです。

3. オーストラリアは多文化社会なんです。

Sentence 2 describes icons in Australia but Sentence 3 suddenly jumps to multiculturism in Australia. Therefore, Jiyoung is trying to develop a transition from icons in Sydney (Opera House and Harbour Bridge) to multiculturism by stating famous places we often watch on TV such Opera House or Harbour Bridge filled only with White people are not everything of Australia.

4. 人たちがいろんな食べ物やレジャーを楽しんで生きられる社会です。

5.では、私たちと一緒に、この新しいオーストラリアを探しに行きましょう。

Jiyoung is trying to develop a transition from Australia to Sydney at the end of their introduction as the main focus of their story is multiculturism in Sydney.

[23] This section can be watched at:
https://www.youtube.com/watch?v=4H7c6MLfE1g
'マルチカルチャーのオーストラリア'(Multi-culture in Australia) (0:00-0:54)

Translation of the above draft by the researcher

1. For you, what kind of country Australia is?
2. To tell the truth, famous places we often watch in TV such as Opera House or Harbour Bridge are not everything of Australia.
3. Australia is a multicultural society.

Sentence 2 describes icons in Australia but Sentence 3 suddenly jumps to multiculturism in Australia. Therefore, Jiyoung is trying to develop a transition from icons in Sydney (Opera House and Harbour Bridge) to multiculturism by stating famous places we often watch on TV such Opera House or Harbour Bridge filled only with White people are not everything of Australia.

4. It is the society people can enjoy various food and leisure.
5. Then, why don't you explore this new Australia.

Jiyoung is trying to develop a transition from Australia to Sydney at the end of their introduction as the main focus of their story is multiculturism in Sydney.

To connect the icons in Sydney to multiculturalism in their introduction, Jiyoung read aloud their script in Turn 1 in Excerpt 7 and suggested adding '白人ばかりの'((filled with) only White people) to modify Opera House and Harbour Bridge in Sentence 2.

While reading aloud their introduction, Jiyoung realised that there was a second transition problem in their introduction: lack of effective transition from Australia (a country) to Sydney (a city of Australia) at the end of introduction. Although their introduction started with an overview of Australia, the main focus of the body paragraphs is the diversity of people, food and leisure activities in Sydney. To develop a flow in their story, they needed to perfect the transition from Australia to Sydney by the end of their introduction.

Excerpt 7

1 Jiyoung: ((Reading their draft aloud)) 実はテレビでよく見かけるオーストラリアは白人ばかりのオペラハウスやハーバーブリッジはオーストラリアの全てではないです。オーストラリアは多文化社会なんです。人たちが色々な食べ物やレジャーを楽しんで生きられる社会です。では、私たちと一緒にこの新しいオーストラリアを, オーストラリア、シドニー？

((Reading their draft aloud)) To tell the truth, famous places we often watch on TV such Opera House or Harbour Bridge filled only with White people are not everything of Australia. Australia is a multicultural society. It is the society people can enjoy various food and leisure. Then, (why don't you explore) this new Australia, Australia, Sydney?

2 Walter: ((Silent for four second)) Amm. ((Silent for four seconds)) <hhh> Yeah, Sydney.

3 Jiyoung: Sydney?

4 Walter: Yeah. We have to change everything to Sydney. Amm.

5 Jiyoung: We have to mention that.

6 Walter: Oh, no. Actually. While you are talking about Opera House and Sydney, these are essentially amm. That one you can leave it as Australian. The other ones you can change it as Sydney. Like 'オーストラリアのシドニーの全てではないです。'((This is not) everything about Sydney of Australia.).

7 Jiyoung: But it might be little confusing cause we are talking in the first sentence we are saying what kind of country Australia is and then you all of sudden say this is not the everything about Sydney.

8 Walter: Yeah. Then we should change (it to) あなたにとってシドニーはどんな町ですか。どんなところ'(For you, what kind of city Sydney is, what kind of place.)

9 Jiyoung: Is that too specific? Because we started video or something more general to specific. As you said Japanese people might not know Sydney.

10 Walter: Yeah. You are right.

11 Jiyoung: Maybe they might think Sydney from European countries or something.

12 Walter: Ok. Yeah.

13 Jiyoung: You know what I mean. Then, we can say. What about explore Sydney as a part of Australia with us. If we fix sentences.

14 Walter: Ok. We may leave Australia until the last of a whole intro, then in body paragraph we change a whole paragraph as Sydney.

After identifying the second transition problem between the introduction and the body paragraphs, Jiyoung started to ask Walter in Turn 1 whether they should end their introduction by saying, 'Why don't you explore this new Australia with us' or 'Why don't you explore Sydney with us'. Responding to Jiyoung question, Walter first suggested in Turn 4 that they replace all uses of the word 'Australia' in their draft with the word 'Sydney'. He then suggested that they replace 'Australia' with 'Sydney' except in the second sentence when they mention that the 'Opera House and Harbour Bridge are not everything about Australia'.

However, Jiyoung pointed out in Turn 7 that Walter's suggestion in Turn 6 also impacted the connection between sentences 1 and 2 when they ask the audience, "For you, what kind of country is Australia?" before then stating, "This is not everything of Sydney'. The solution to maintaining the connection between sentences 1 and 2 came from Walter who suggested in

Turn 8 that they change sentence 1 to “あなたにとってシドニーはどんな町ですか。どんなところ” (For you, what kind of city is Sydney, what kind of place?).

Jiyoung rejected Walter’s suggestion in Turn 8 by asserting that the video should start with a general statement about the topic (e.g., Australia) and then move on to specific elements of the topic (e.g., Sydney, a city in Australia) because some audiences might not know the country in which Sydney is located. However, the discussion with Walter prompted Jiyoung in Turn 13 to develop a sentence which effectively shifted the focus from Australia to Sydney at the end of their introduction; “Explore Sydney as a part of Australia with us”. Agreeing with Jiyoung’s suggestion, Walter summarised the procedures for revising the task in Turn 14.

Thus, active discussion of the story structure allowed Pair 6 (Jiyoung/Walter) to co-construct a sentence which effectively shifted the focus from Australia to Sydney at the end of their introduction. In other words, the active discussion of sentence structure enabled the pair to co-construct effective sentences which would otherwise be difficult to achieve by themselves.

5.4.4 Task management by Pattern 4 (limited spoken interactions)

1) Distribution of Task Management Episodes

Pair 7 (Rena/Rita), developed Pattern 4 (limited spoken interactions) which manifested as limited interactions to discuss task procedures. Table 5.26 shows the distribution of TMEs discussed by the seven pairs during their projects. It indicates that Pair 7 initiated the least number of LREs (n=47) among the seven pairs by discussing 12 to 18 TMEs during the three production stages.

Table 5.26: Distribution of TMEs by the seven pairs

Pattern	**Pattern 1**				**Pattern 2**	**Pattern 3**	**Pattern 4**
Pair	**Pair 1 (Tessie /Yujin)**	**Pair 2 (Kasumi/ Sky)**	**Pair 3 (Sherry /Stephanie)**	**Pair 4 (Brian/ Po)**	**Pair 5 (Lucie/ Yuki)**	**Pair 6 (Jiyoung/Walter)**	**Pair 7 (Rita/Rena)**
1. Develop a story	17	52	88	190	429	136	17
2. Write their script	15	English=0 Japanese=1	English=48 Japanese=8	71	English=0 Japanese=5	149	18
3. Modify their script	12	English=0 Japanese=5	English=0 Japanese=7	0	English=102 Japanese=0	99	12
Total	44	58	151	261	536	384	47

2) Characteristics of Task Management Episodes

The TMEs discussed by Pair 7 (Rena/Rita) as part of the Pattern 4 (limited spoken interactions) development had three main characteristics: 1) interactions separated by long periods of silence; 2) task control by one participant; and 3) exchanging suggestions by typing and monitoring. Excerpt 8 is an example of the TMEs discussed by Pair 7 which demonstrates all three characteristics. Image 5.3 is a screenshot of Rena's laptop during the discussion and consists of three sections: Section 1 which Rena completed by herself before the writing section; Section 2 which Rena typed to incorporate Rita's suggestions before passing her laptop to Rita; and Section 3 which Rita typed using Rena's laptop to provide her suggestions to Rena. Excerpt 8 occurred shortly after Rena read aloud the script she had written independently prior to the writing session (Section 1 in Image 5.3) when they started to write the latter half of their Japanese script:

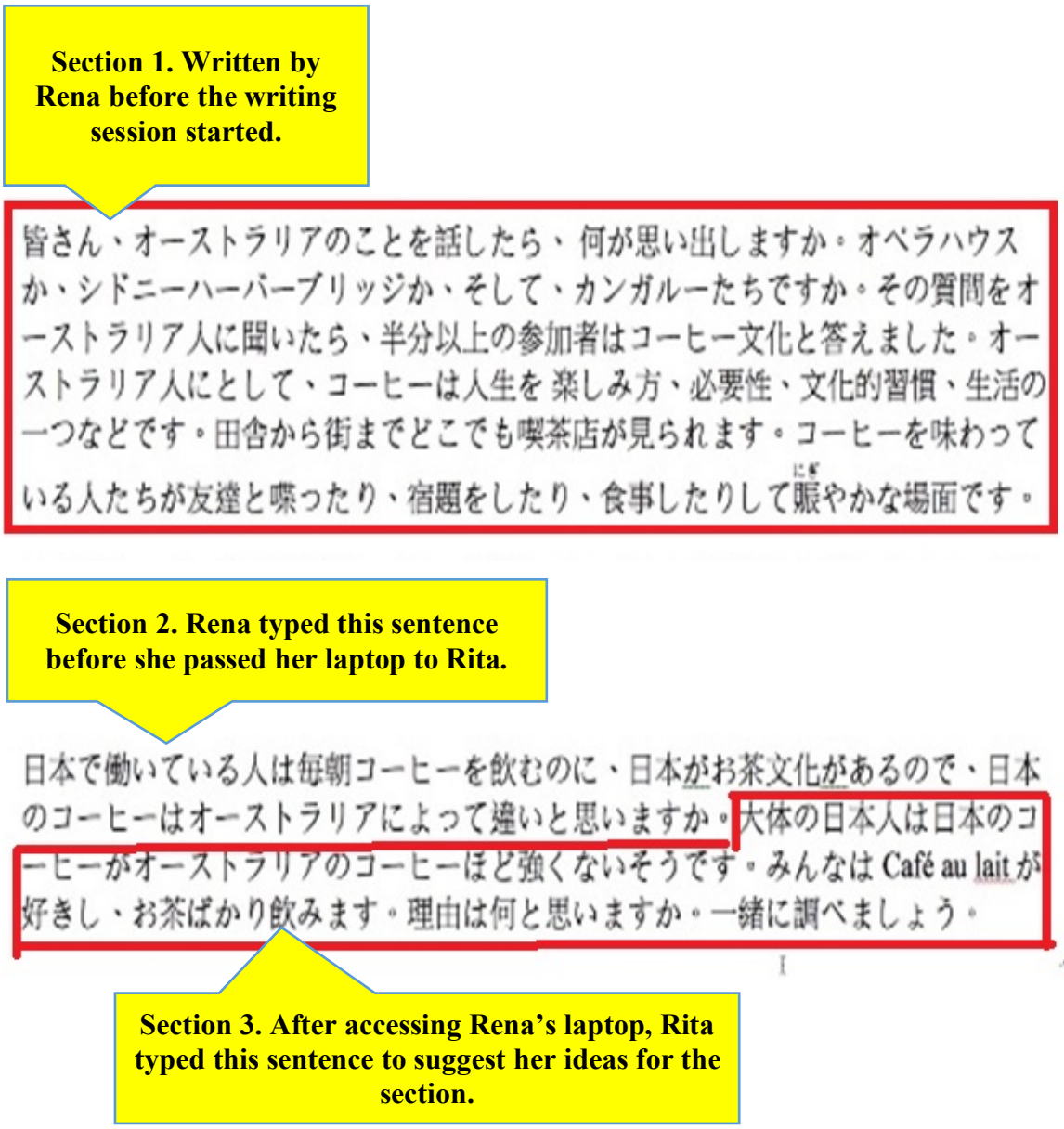


Image 5.3: A screenshot of Rena's laptop recorded while discussing Excerpt 8

The translation of Pair 7's script (Image 5.3) by the researcher

1) Written by Rena before writing session started
If you heard of Australia, what do you recall? Opera House? Sydney Harbour Bridge or kangaroos? I asked the questions to Australian, and half of the participants replied as 'coffee culture'. For Australians, coffee is joy of life, important things, a cultural practice, and a part of their life. (You) can see coffee shops everywhere from countryside to cities (in Australia). (You can see) lively places where people enjoy coffee chat with friends, do their homework, and eat (their food in coffee shops in Australia).

2) A sentence typed by Rena before she passed her laptop to Rita by incorporating Rita's suggestion
Although people working in Japan drink coffee every morning, as Japan has tea culture, do you think Japanese coffee is different from Australia?

3) Typed by Rena to describe her suggestions
Many Japanese said that Japanese coffee is not strong as Australian ones. Everyone (in Japan) likes café ore, drink only tea. What do you think the reason? Let's explore (them) together.

Excerpt 8 reveals that the problem Pair 7 (Rena/Rita) encountered in the story-writing process relates to the different objectives they have for their project. Prior to this discussion, Rena and Rita had not clarified what story genre they wanted to write, although they had decided to write a digital story about the coffee culture in Australia. Pair 7 did not discuss objects of their project prior to writing their script. As a result, Rita was not aware of the different objectives they had for the project; that is, whether to write 'an emotional story of coffee culture in Australia' (Rena) or to write a 'comparison of beverage culture in Australia and Japan using their survey resutls' (Rita). Because Rita was not aware that Rena had a different story objective, she provided Rena with an irrelevant suggestion in Turn 1. Rena firmly rejected Rita's suggestion in Turn 2 by stating, 'It does not makes sense'.

Excerpt 8

1. Rita: So (we can say) but Japanese coffee is not coffee.

2. Rena: ((Typing without looking at Rita)) It does not make sense.

((Silent for 13 seconds))

3. Rita: Or we can say because they[Japanese] have (their own) coffee. But their coffee tastes different from Melbourne coffee because they have tea.

4. Rena: ((Rena kept typing sentences by incorporating Rita's suggestion without looking at Rita for 53 seconds. Once finished typing, Rena passed her laptop to Rita so that Rita could type what she wanted to suggest.))

5. Rita: ((Rita kept typing sentences she wished to suggest for nine minutes with a silence. Rena was monitoring what Rita was writing via a shared screen connected to Rena's computer.))

After 13 seconds of silence, Rita suggested to Rena in Turn 3 that they explain how Japanese coffee is different to the coffee in Melbourne due to the predominance of a tea culture in Japan. Instead of replying to Rita using spoken interactions, Rena responded to Rita's suggestion by typing a sentence which partially incorporated Rita's suggestion (see Section 2, Image 5.3), leading to 53 seconds of silence.

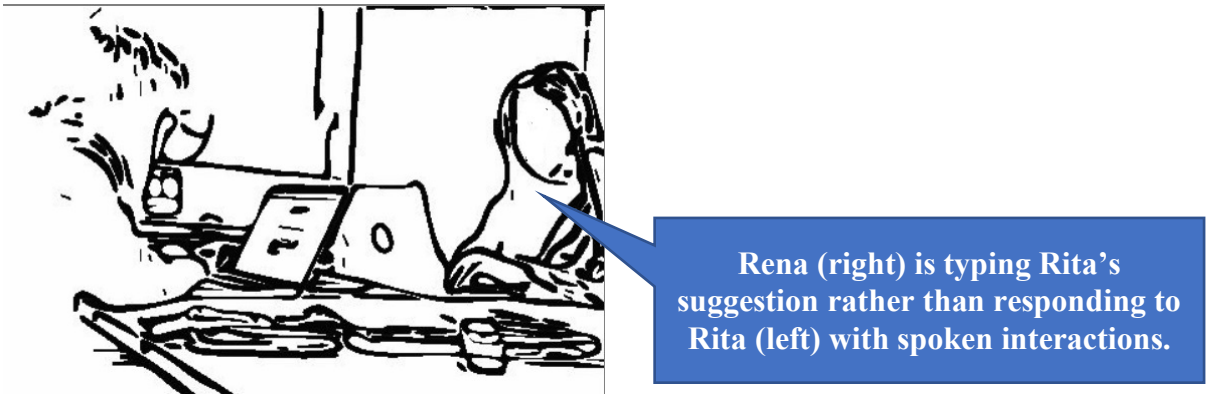


Image 5.4: Rena (right) is typing sentences instead of verbally responding to Rita's (left) suggestion

After rejecting Rita's suggestions several times in Excerpt 8, Rena finally permitted Rita to 'write' her suggested sentences as 'a co-writer' by passing her laptop to Rita (Image 5.5). Instead of describing her suggestions to Rena via spoken interactions, Rita kept typing her sentences (Section 3 in Image 5.3) using Rena's laptop (Image 5.5), resulting in nine minutes of silence. While Rita was typing her suggestions, Rena silently monitored what Rita was writing via a shared screen feature (Image 5.6).

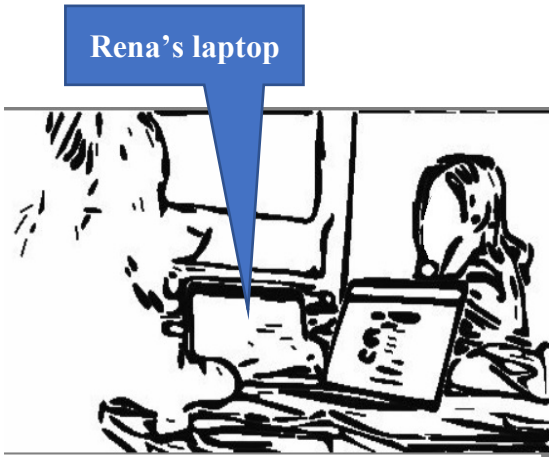


Image 5.5: Rena (right) is turning her computer towards Rita (left) so that she can type her suggestions

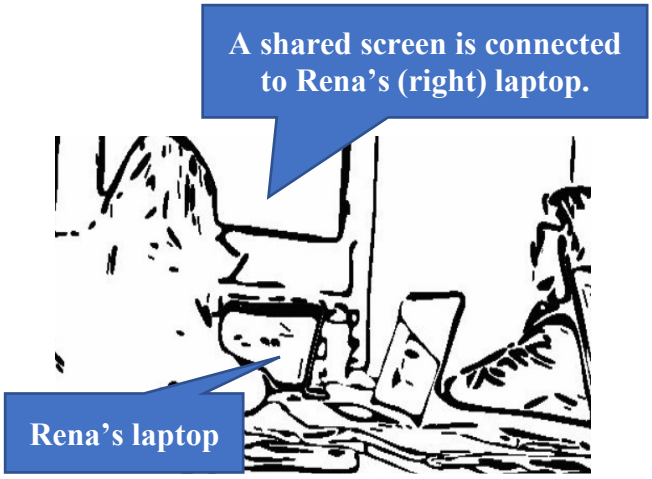


Image 5.6: Rita (left) is typing her suggestions instead of verbally responding to Rena (right). Rena is monitoring what Rita is writing

As Excerpt 8 demonstrates, a pair can exchange ideas by typing and monitoring rather than through spoken interactions. However, communication via 'typing' and 'monitoring' may reduce the number of TMEs the pair initiates to discuss the task procedures. Pair 7 (Rena/Rita) initiated only 47 TMEs during their project, which was the second least number among the seven pairs (see Table 5.26).

5.4.5 Summary of Task Management

Section 5.4 compared the task management characteristics demonstrated by the seven participant pairs in this study. The findings showed that the seven pairs developed TMEs with different quantitative and qualitative characteristics. Table 5.27 summarised the number and characteristics of the TMEs discussed by each pair.

Table 5.27: Distribution of TMEs and characteristics of task management by the seven pairs

Pattern	**Pattern 1 (Division of labour)**				**Pattern 2 (Collaborative storytelling)**	**Pattern 3 (Collaborative knowledge constructions)**	**Pattern 4 (Limited spoken interactions)**
Pair	**Pair 1 (Tessie /Yujin)**	**Pair 2 (Kasumi /Sky)**	**Pair 3 (Sherry /Stephanie)**	**Pair 4 (Brian/ Po)**	**Pair 5 (Lucie/ Yuki)**	**Pair 6 (Jiyoung/Walter)**	**Pair 7 (Rita/Rena)**
1. Story development stage	17	52	88	190	429	136	17
2. Write their script	15	English=0 Japanese=1	English=48 Japanese=8	71	English=0 Japanese=5	149	18
3. Modify their script	12	English=0 Japanese=5	English=0 Japanese=7	0	English=102 Japanese=0	99	12
TMEs in total	44	58	151	261	536	384	47
Characteristics of Task management	1) Negotiation of task allocation, role allocation, and working platforms 2) Variations in the number of TMEs discussed by the four pairs 3) Completing different parts of the task synchronously or asynchronously, independently or collaboratively 4) Dividing roles for efficiency				1) Active discussion of TMEs (story structure) during story development stage 2) Initiated the second largest number of TMEs among the seven pairs	1) Providing suggestions building upon peer's contributions 2) Active discussion of a story structure 3) Active discussion of TMEs throughout the three production stages	1) Interactions with a long silence, task control by one participant, and exchanging suggestions by typing and monitoring 2) Initiated the second least TMEs among the seven pairs

As discussed in Section 5.3, Pattern 1 (division of labour) was the pattern most frequently observed during this long-term collaborative learning project. As seen in Table 5.25, the participants' task management is characterised by the following features; 1) negotiation of task and role division, and working platforms; 2) completing different parts of the task synchronously or asynchronously, independently or collaboratively; 3) completing the same task more efficiently by playing different roles. The four pairs manifest some variations in the number of TMEs they initiated ranging from 44 TMEs (Pair 1) to 261 TMEs (Pair 4).

A distinctive feature of the TMEs initiated by Pair 5 (Lucie/Yuki), who displayed Pattern 2 (collaborative storytelling), is their active interactions to initiate TMEs to discuss the story structure during the story development stage. The pair initiated 429 TMEs during story development and this led them to produce the largest number of TMEs (n=536) among the seven pairs.

The TMEs discussed by Pair 6 (Jiyoung/Walter) displaying Pattern 3 (collaborative knowledge constructions) are characterised by their active role in all production stages, ranging from 99 TMEs during the modifying stage to 149 TMEs during the writing stage. The distinctive features of their TEMs are: 1) providing suggestions to build upon their peer's contribution; and 2) active discussion of sentence structure.

Finally, the TMEs discussed by Pair 7 (Rena/Rita), developed as 'Pattern 4' (limited spoken interactions), are characterised by long silences, task control by one participant, division of roles, and the exchange of suggestions by typing and monitoring. The pair initiated the second least amount of TMEs among the seven pairs (n=47). Exchanging suggestions by typing and monitoring also reduced the number of TMEs the pair discussed during the project.

Thus, this section demonstrates that pairs with different interaction patterns developed TMEs with different quantitative and qualitative characteristics. Pairs with different interaction patterns initiated more TMEs during the different project stages. Chapter 6 compares the quantitative and qualitative characteristics of the LREs discussed by the seven pairs for language learning.

5.5 Conclusion

The aim of this chapter was to discuss the three core aspects of this study: 1) the background details of the seven projects and their task procedures; 2) the characteristics of the four interaction patterns developed by the seven pairs; and 3) the characteristic of their task management. This study examined patterns of peer interactions by analysing how each pair approaches the task and allocates the roles, and how often they initiate TMEs and LREs during the three production stages. The results showed that the seven pairs developed four patterns of peer interaction; Pattern 1 - division of labour; Pattern 2 - collaborative storytelling; Pattern 3 - collaborative knowledge constructions; and Pattern 4 - limited spoken interactions. The pair groups with different interaction patterns allocated their tasks and roles differently, and initiated TMEs and LREs to different extents in different production stages. Qualitative analysis of the TMEs also showed pairs with different interaction patterns developed distinctive TME features. Table 5.28 summarises the peer interaction characteristics discussed in this chapter.

Table 5.28: A summary of four interactions patterns observed in collaborative digital storytelling projects

	Pairs who showed the pattern	**Division of labour**		**TMEs**		**LREs**	
		Division of tasks	**Division of roles**	**Number of TMEs**	**Qualitative characteristics of TMEs**	**Number of LREs**	**Qualitative characteristics of LREs**
1. Division of labour	Pair 1 (Tessie/ Yujin) Pair 2 (Kasumi/ Sky) Pair 3 (Brian/Po) Pair 4 (Sherry/Stephanie)	Divided their tasks (and roles) particularly during writing and modifying stages to complete different parts of their tasks at the same time or in their convenient time.	Showed three variations: 1) played the same role; 2) played different roles; and 3) played additional roles.	Showed a large gap in the number of TMEs each pair initiated ranging from 44 TMEs to 261 TMEs.	Negotiated division of task. Negotiated roles. Negotiated a working platform.	Showed some variations in the number of LREs, ranging from seven LREs to 25 LREs	**I discuss this in Chapter 6 and 7**
2. Collaborative storytelling	Pair 5 (Lucie/ Yuki)	Actively discussed TMEs during story development stages although they have divided their tasks in all three production stages.	1) Both participants played the same role as 'a story creator' and 'a writer' during first two stage. 2) Yuki took an additional role to type their script while modifying her English script.	Actively discussed TMEs to discuss story structure in particularly during story development stage.	1) Actively discussed story structure. 2) Invested longest time to discuss story structure among the seven pairs.	Showed limited interactions to discuss LREs with their peer.	

3. Collaborative knowledge constructions	Pair 6 (Jiyoung/ Walter)	Worked on the same part of their tasks throughout the project except for the video editing task.	1) Played the same role as 'a story creator' during story development stage. 2) Jiyoung took an additional role to type during their project.	Actively discuss TMEs to manage their task procedures in all three stages.	Provided suggestions building upon peer's contributions. Active discussion of sentence structures.	Produced the largest amount of LREs during the project among the seven pairs.	**I discuss this in Chapter 6 and 7**
4. Limited spoken interactions	Pair 7 (Rena/ Rita)	Worked on the same part of their tasks throughout the project except for first half of their script.	1) Played the same role during story development stage. 2) Rena wrote first half of their script as 'sole writer'. 3) Rita took a role to find information relevant to the section Rena was writing, whereas Rena took a role to write their script by deciding what information she should include and how she wrote their script.	Developed least spoken interactions with peer to discuss task procedures.	A long silence, task control by Rena, interactions by typing and monitoring.	Developed few spoken interactions with peer to discuss language problems with peers.	

The findings reported in this chapter highlighted a wide range of practices to facilitate task and role division, and more interactions by the peers to discuss LMEs compared to LREs for language learning during the long-term collaborative project. Previous studies conducted in short-term collaborative learning tasks have documented how learners construct knowledge of their target language by working on the same part of the task and by discussing LREs with peers (Edstrom, 2015; Hsieh, 2017; Storch, 2002). On the other hand, findings in this chapter revealed that six of the seven pairs divided their task and roles and engaged in fewer LREs than LMEs to solve language problems for language learning during the long-term project. Six of the seven pairs have divided their tasks and roles during all or some of the stages to complete their project efficiently. Writing tasks particularly were divided by all pairs except Pair 6 (Jiyoung/Walter) who developed 'Pattern 3' (collaborative knowledge constructions). In addition, only Pair 6 demonstrated active engagement in discussing LREs to solve their language problems for language learning.

The findings in this study raise important questions for language educators; Are learners still engaged in learning Japanese despite their task and role division, and having fewer interactions to discuss LREs with peers during the project? If so, how do they construct opportunities to engage in Japanese language learning within the learning conditions of the project? The next chapter explores how those participants engage in learning Japanese by discussing LREs with peers.

Chapter 6

Comparing language learning in collaborative dialogue with peers during collaborative digital storytelling projects

6.1 Introduction

In previous chapter, the patterns of peer interactions developed among the seven participant pairs during the long-term collaborative project were examined by analysing two interaction aspects: 1) allocation of tasks and roles; and 2) distribution of Task Management Episodes (TMEs) and Language-Related Episodes (LREs). The findings showed that the participants developed the following four interaction patterns: 1) 'division of labour'; 2) 'collaborative storytelling'; 3) 'collaborative knowledge constructions'; and 4) 'limited spoken interactions'. The discussion of the findings in Chapter 5 highlighted that there were wide-spread practices of 'division of labour' and some pairs had fewer interactions to discuss LREs with peers for language learning. The findings raised important questions regarding language learning during this project; for instance, does the quantity and quality of the LREs matter? If so, how did the pairs who discuss fewer LREs still engage in language learning? Also, how did the LREs of different quality provide each pair with different opportunities for language learning?

To address these questions, Chapter 6 analyses the quality of language learning among the seven pairs when engaged in collaborative dialogue with peers by comparing their LREs quantitatively and qualitatively. First, Section 6.1.1 describes the analytical procedures used to analyse the quantity and quality of the LREs. Section 6.2 explores how LREs of different quality provided the pairs with different types of opportunities for language learning by drawing on the concepts of LREs related to 'elaborate engagement' and 'limited engagement' (Storch, 2008). Section 6.3 compares the quality of each pairs' engagement in language

learning by examining the number of LREs correctly resolved, incorrectly resolved or unresolved (Swain & Lapkin, 1995). Section 6.4 explores the quality of the LREs discussed by the seven pairs by analysing the communication functions for which the LREs were initiated, and the probability of each function triggering either LREs with 'elaborate engagement' or with 'limited engagement'. In Section 6.5, the quality of the participant pairs' LREs are further compared with different functions per engagement level. Section 6.6 highlights quantitative and qualitative differences of the participants' engagement in language learning through collaborative dialogue with peers[24]. I conclude this chapter by raising the need to examine the process of language learning undertaken by the participants in multiple learning contexts in addition to collaborative dialogue with peers.

6.1.1 Analytical procedures

The aim of Chapter 6 is to answer Research Question 2; do the participants use collaborative dialogue to enhance their language learning? Analysis of the pilot study data showed that the participants engaged in language learning not only in collaborative dialogue with peers, but also in multiple learning contexts inside and outside collaborative dialogue. However, this chapter focuses on analysing their language learning in the former learning context; that is, learning Japanese in collaborative dialogue with peers. To examine the participants' language learning inside collaborative dialogue with peers, the following four coding procedures were employed: 1) analysing 'level of engagement' in discussing LREs (Storch, 2008); 2) identifying the number of LREs resolved and unresolved (Swain & Lapkin, 1995); 3) examining the reasons for the unresolved LREs; and 4) functions of LREs served in

[24] As the focus of this chapter is to discuss language learning undertaken by the participants through collaborative dialogue with peers, this chapter analyses excerpts where the participants discuss LREs only by sharing their linguistic resource with peers. However, quantitative data (the number of LREs discussed by each peer) in this chapter includes the number of LREs they resolved by using alternative resources other than their peers (discussed in Chapter 7) such as the researcher and online resources. Qualitative analysis of LREs they resolved by using alternative resources will be discussed in Chapter 7.

collaborative dialogue. The following sections provide in-depth descriptions of each coding procedure.

First coding procedure

To compare the quality of the LREs discussed by each pair, the nodes coded as 'LREs' were further classified according to the concept of 'level of engagement' in discussing LREs with peers proposed by Storch (2008). According to the author, LREs discussed by learners can be classified either into "elaborate engagement" or "limited engagement" (p. 100). LREs with 'elaborate engagement' are those in which "participants deliberated over the language items, sought and provided confirmations, and explanations, and alternatives". Storch described LREs with 'limited engagement' as LREs in which "participants simply stated the linguistic item without further deliberation" (p.100). Adhering to her suggestion, the researcher classified LREs discussed by the participants either into LREs with elaborate engagement or the ones with limited engagement.

This study conducted the data collection under different research contexts from Storch (2008); 1) learners of Japanese vs learners of English; and 2) using additional resources such as online resources vs resolving language problems only by pooling own linguist knowledge. As a result, different types of LREs with 'limited engagement', which were not reported by Storch (2008), were also observed; including LREs resolving language problems 1) by providing a one-word or one-phrase translation; 2) pronouncing Japanese words written with '*kanji*'; and 3) by consulting online resources and by not further deliberating the language meaning or usage verbally. The third type of LREs can be interpreted as LREs with elaborate engagement by focusing on learners' active learning behavior consulting with online resources. However, the researcher coded all of these LREs as 'limited engagement' as the participants did not elaborate meaning or usage of the Japanese expressions in depth with spoken

interactions. Table 6.1 shows each coding category for 'level of engagement' with a sample excerpt.

After completing the above-mentioned coding procedure, the efficiency of language learning by each pair while engaged in collaborative dialogue was compared by analysing two aspects of their LREs: 1) the number of LREs in total discussed by each pair; and 2) the percentage of LREs with each engagement level initiated by each pair. To calculate the percentage, the number of LREs per each engagement level discussed by each pair was divided by the total number of LREs discussed by the pair.

Table 6.1: Coding categories for level of engagement

Coding categories	**A sample excerpt for each coding category**
1. Elaborate engagement	**An example of a short peer response, but classified as LREs with 'elaborate engagement'** 1.Walter: ((Explaining different usages of Japanese particle, 'や (*ya*)'、'と (*to*)'to Jiyoung)) When you use 'や (*ya*)', you are listing. You are not gonna list everything. If you use 'と (*to*)', you list everything. 2. Jiyoung: (Using 'や(*ya*)' in this sentence) must be better. Then 'や(*ya*)' is better as we are listing many types of people ethnicity.
2. Limited engagement	**A sample excerpt of a peer response by providing a one-word translation** **(This excerpt was coded as 'limited engagement' as Jiyoung provided only one-word translation in Turn 2. In Turn 4, she typed '昼間'(day time) for Walter, but she did not further deliberate the meaning or usage orally.)** 1. Walter: How do you say 'day time' (in Japanese)? 2. Jiyoung: '昼間'(Day time) 3. Walter: I forgot *kanji* for hiragana. 4. Jiyoung: ((Typed '昼間'(day time) for Walter).

Second coding procedure

To compare the efficiency of language learning by the seven pairs when engaged in collaborative dialogue with peers, the nodes coded as 'LREs' were further classified into three categories; 1) LREs correctly resolved; 2) LREs incorrectly resolved; and 3) unresolved LREs (e.g., Lesser, 2004; Swain, 1998). Table 6.2 indicates a sample excerpt for each coding category. As seen in Table 6.2, episodes which learners correctly resolved their language problems by sharing their linguistic knowledge were coded as 'LREs correctly resolved'. LREs which learners resolved their language problems incorrectly was coded as 'LREs incorrectly resolved'. Finally, 'unresolved LREs' were allocated to the episodes learners unresolved or abandoned to resolve their language problems. To compare the percentage of LREs correctly resolved or unresolved per pair, each type of LRE discussed by each pair was divided by the total number of LREs produced by each pair.

Table 6.2: Coding categories for resolved LREs and unresolved LREs

Coding categories	Sample excerpt for each coding category
1. LREs correctly resolved	1. Lucie: ((Reading a sentence typed by Yuki)) '**ゆきちゃんの留学(感想)について聞きたいな。**'(I would like to listen to Yuki *chan*'s (impressions about) study abroad.' Is that '**感想**(*kansō*)'(an impression)?' 2. Yuki: ((Pronouncing the *kanji* words for Lucie)) '**感想聞きたいな。**'(I would like to listen to (your) impressions).
2. LREs incorrectly resolved	**In the following excerpt, Jiyoung and Walter are constructing a sentence to state: '子供も大人もパブに入って、ハンバーガーやフィッシュアンドチップスを食べることができます。' (Both children and adult can go to a pub, and eat a hamburger, and Fish and Chips). To state 'both children and adult' in Japanese, they have to use '__も__も(*_mo_mo*)'. However, the pair decided to use '__と__も(*_to_mo*)' incorrectly in Turn 5.** 1. Walter: '子供と子供と大人と子供と大人と子供も'(Children and, children and adult, children and adult, and children) 2: Jiyoung: ((Typing a phrase suggested by Walter) '大人と子供も' (Adult and children) 3. Walter: ((Suggesting to use 'と(*to*)')) "と大人と子供と"(And adult and children) 4: Jiyoung: Would you go with '__も__も(*_mo_mo*)' or '__も__と(*_mo_to*)'? 5: Walter: As well as. I think as well as is 'と(*to*)' and 'も(*mo*)'
3. Unresolved LREs	**Stephanie suggested to consult with Japanese in Turn 2 to check whether or not a Japanese sentence Sherry initiated to discuss in Turn 1 is appropriate as Japanese. Therefore, the pair abandoned to further discuss the sentence.** 1. Sherry: ((Read script with soft voice)) Does this sound weird? '今からちょっと（シドニーを）冒険しましょう。' (Let's have an adventure (of Sydney)'. 2. Stephanie: ((Suggesting to receive feedback from Japanese instead of commenting appropriateness of the Japanese expression)) Maybe that's the benefit to show it to maybe native Japanese speakers. They might know colloquisim that is better or maybe something sounds natural more.

Third coding procedure

The third coding procedure aimed to identify the reasons the LREs were not correctly resolved by the participants. Towards this aim, the LRE segments were read carefully and coded as 'unresolved' in the aforementioned second procedure. Based on the pilot analysis, the following three coding categories were developed as the reasons for unresolved LREs: 1) participant's inability to provide appropriate suggestions; 2) prioritising completion of other tasks over discussion of LREs with peers for language learning; and 3) participant's inability to describe own language problems. Using the three coding categories, the nodes coded as 'unresolved LREs' were further classified according to the reasons for the unresolved LREs. Table 6.3 shows the three coding categories with a sample excerpt for each category.

Table 6.3: Coding categories for the reasons of unresolved LREs

Coding categories	Sample excerpt for each coding category
1. Participant's inability to provide appropriate suggestions	1. Brian: What can we call 'conference'? I don't know what we call the place we did a camp. Cause it was not a tent. Barely like a hotel. Two floors. Like a hotel but not like a hotel. 2. Po: Amm. ((He tried to recall a Japanese word to describe a facility Japanese student organisation held 'summer camp'. However, he could come up the word.))
2. Prioritising completion of other tasks over discussion of LREs with peers for language learning	1. Brian: I don't know right '漢字'(Chinese Characters adopted in Japanese writing system) for '授業 (*jyugyō*)'(class). 2. Po: ((Po did not responded to Brian, but continued to complete writing his own lines via Google Docs.))
	Although Rita explained what she meant by stating 'original' in Turn 2, her descriptions for her intended meaning was not clear for Rena. 1. Rena: What do you mean by 'original'? 2. Rita: (By saying 'Japan has original coffee), I want to make a contrast with what we said. So we say Australia has coffee. Maybe Japanese coffee is not real coffee (from Australians' perspective) like that. 3.Rena: ((Rena was looking at shared screen and thinking of the Japanese expression Rita has asked her. But she could not provide any suggestions to express 'Japan has their own coffee'.))

Fourth coding procedure

In the fourth coding procedure, the communication functions each LRE served in the collaborative dialogue were identified. This coding procedure had two purposes: 1) to explore which LRE functions were more or less likely to develop either LREs with 'elaborate engagement' or LREs with 'limited engagement'; and 2) to compare the number of LRE functions initiated by each pair.

To distinguish how LREs were initiated by the seven participant pairs, the nine coding categories presented in Table 6.4 were initially developed based on the pilot data analysis: 1) requesting the provision of a Japanese word or expression; 2) confirming a Japanese word or expression; 3) requesting an explanation of a Japanese word or expression; 4) explaining a Japanese word or expression; 5) correcting a peer's word or expression; 6) providing a Japanese word or expression; 7) pointing out a peer's error; 8) confirming the pronunciation of a Japanese word written with *kanji*; and 9) unresolved LREs. Table 6.4 indicates the coding category for each LRE function and provides a sample excerpt. Using the nine coding categories, the nodes coded with 'LREs' were further classified according to the function each LRE served in the collaborative dialogue:

Table 6.4: Coding categories for LREs functions

Coding categories	A sample excerpt for each coding category
1. Requesting the provision of a Japanese word or expression	1. Walter: Sorry. ((Requesting Jiyoung to repeat the world she has just said as he could not hear well)) What is the word for *imi*? 2. Jiyoung:'移民(*imin*)' (Immigrants).
2. Confirming a Japanese word or expression	1. Yuki: One day is 'ある日'(one day)? ((Yuki looked at the researcher and asked her.)) 2. Researcher: Yeah, like 'ある日'(one day).
3. Requesting an explanation of a Japanese word or expression	1. Walter: ((Requesting the meaning of)) '交流'(Interactions)? 2. Jiyoung: ((Jiyoung kept reading a sentence she has typed) '交流してきました。'((Australia) has interactions (with different cultures.)) 3. Walter: I don't know '交流'(interactions). 4. Jiyoung: I guess '交流'(interactions) is like interactions.
4. Explaining a Japanese word or expression	1. Yujin: ((Showing a paper Yujin corrected for Tessie and explaining the lexical meaning)) '鯉' is a carp 2. Tessie: '鯉' (A carp).
5. Correcting a peer's word or expression	1. Kasumi: ((Suggesting Sky how to revise his script by reading Sky's script)) 'なので (*nanode*)'(Due to). ((She pointed out that Sky should insert 'な (*na*)' between noun and 'ので(*node*)'(due to) to express 'due to (noun)' in Japanese.))

6. Providing a Japanese word or expression	1. Jiyoung: ((Formulating a sentence)) First of all, '食べ物を食べ物を'(food food) 2. Walter: ((Suggesting Jiyoung to use '味わう'(enjoy flavour of the food) even she did not request to do so)) '味わう'(Enjoy flavour of the food). 3: Jiyoung: '味わう' (Enjoy flavour of food). '新しい食べ物を味わう。'(Enjoy flavour of new food).
7. Pointing out a peer's error	1. Brian: '面白いのがオーストラリアの料理がオーストラリア料理に使うことがあまり関係がないから' What is interesting is that (he) did not have relationship to use Australian cuisines, Australian cuisines. 2. Po: '関係？'(Relationship?) 'どういうこと？'(What do you mean?) 3: Brian: Well. '経験、経験がないから'((He did not have) experiences experiences (to cook Australian cuisines) 4: Po: 'うん'(Yes) 5. Brian: えっとパンケーキを作ったとき、失敗した。 When he baked pancakes, he failed (due to lack of his experiences to bake pancakes.
8. Confirming the pronunciation of a Japanese word written with Chinese characters	1.Tessie: ((Pointing '日本舞踊 (*nihon buyō)*'(Japanese traditional dance) to ask how to pronounce the word.)) 2.Yujin: ((Pronounced the *kanji* word for Tessie)) '日本舞踊 (*Nihon buyō)*'(Japanese traditional dance) ((Yujin typed the pronunciation to Tessie's laptop.)) 3.Tessie: '日本舞踊 (*Nihon buyō)*'(Japanese traditional dance)
9. Unresolved LREs	1. Walter: This is new. Important for Japanese. Having a barbecue. (Walter is trying to recall how to write 'barbecue' in Japanese). How do you spell ('barbecue' in Japanese)? 2. Jiyoung: ((She smiled to him but did not teach him how to write 'barbecue' in Japanese)).

To analyse the probability of each function triggering either LREs with 'elaborate engagement' or with 'limited engagement', the nodes coded per LRE function were further classified according to 'level of engagement' in discussing LREs (Storch, 2008). Upon completion of the coding procedures, the number of LRE function per 'level of engagement' was confirmed as indicated by Nvivo (see Image 6.1).

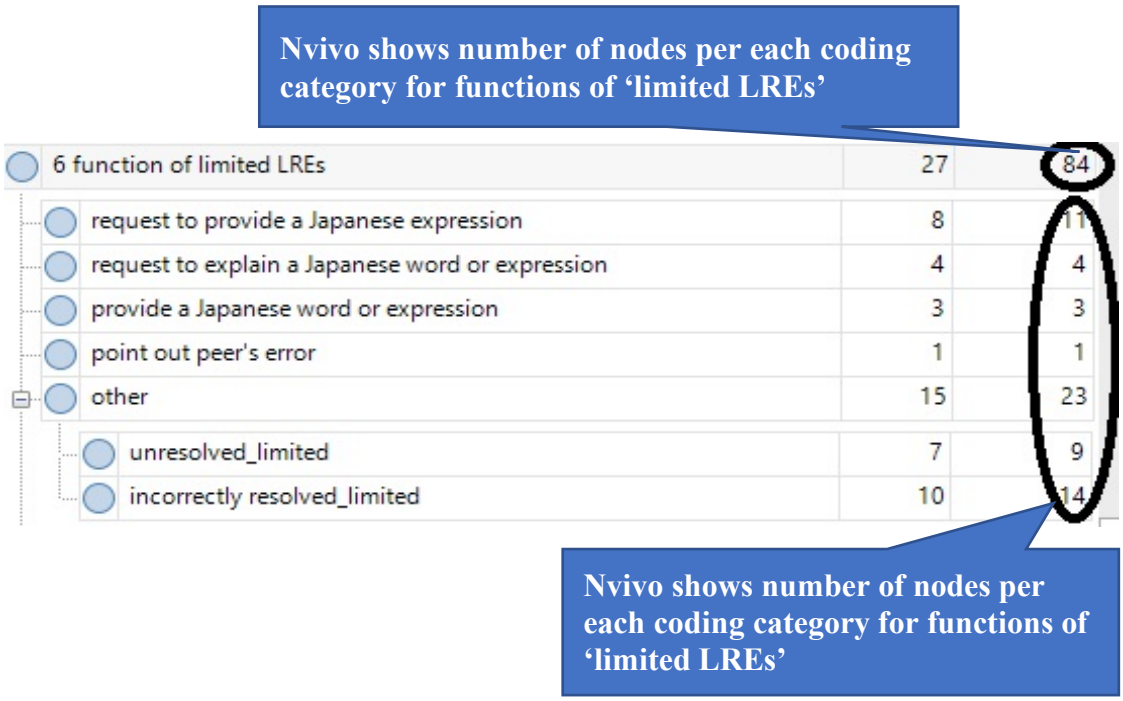


Image 6.1: A part of coding results for functions of LREs with 'limited engagement'

To identify the probabilities of each function triggering either LREs with 'elaborate engagement' or with 'limited engagement', the number of each LRE function per level of engagement was divided by the total number of LREs (n=192) discussed by the seven pairs. To identify the distribution of LRE functions discussed by each pair, 'matrix coding' was applied which allows the users to compare the number of nodes per selected coding categories and cases. The number of each LRE function discussed by each pair per 'level of engagement' was initially querried using the 'matrix coding' function (See Image 6.2). The number of each LRE functions discussed by each pair per 'level of engagement' was then divided by the total number of LREs initiated by each pair.

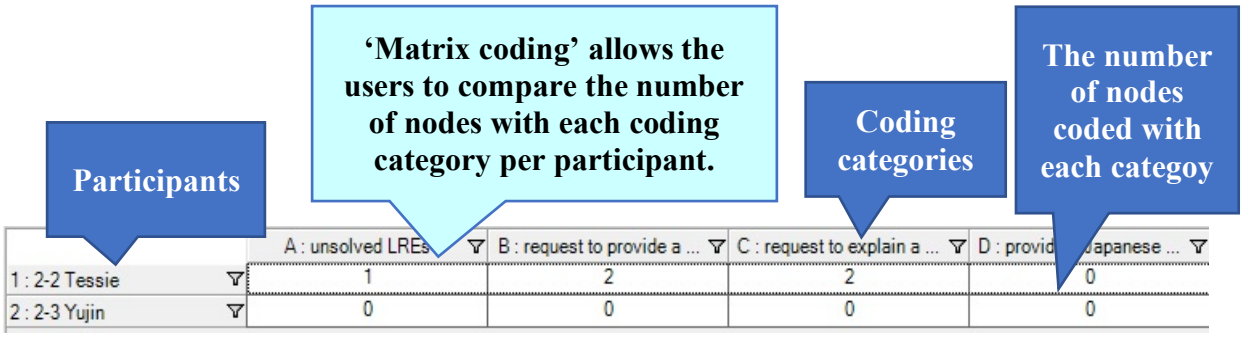


Image 6.2: Sample of query results using 'matrix coding'

6.2 Level of engagement

'Level of engagement' in discussing LREs is an important predictor of the extent to which learners can correctly resolve the LREs discussed with peers in the isomorphic version of the text-construction tasks (Storch, 2008). This section examined the quality LREs discussed by the seven participant pairs by analysing the 'level of engagement' in discussing LREs (Storch, 2008). To operationalise the level of learners' engagement in discussing LREs, Storch suggested that the LREs be classified as either: 1) LREs with 'elaborate engagement' in which learners deliberate over language items by providing "confirmation and explanations, and alternatives"; or 2) LREs with 'limited engagement' in which learners do not further deliberate the language items (Storch, 2008, p. 100). To compare the quality of language learning undertaken by the seven pairs during this project, Section 6.2.1 outlines how the distribution of LREs with different engagement level per pair were examined by classifying the LREs discussed by the seven pairs either into LREs with 'elaborate engagement' or with 'limited engagement' (Storch, 2008). The way in which the LREs with different engagement levels provides different kinds of opportunities for language learning is then demonstrated by comparing excerpts of LREs discussed by the seven pairs with 'elaborate engagement' (Section 6.2.2) to those with 'limited engagement' (Section 6.2.3).

6.2.1 Distribution of LREs with different engagement level

Results of the above analysis showed a large discrepancy in the number of LREs with 'elaborate engagement' compared to 'limited engagement' initiated by the seven pairs during this project. Table 6.5 shows the distribution of LREs initiated by each pair per level of engagement:

Table 6.5: Level of engagement in discussing LREs

Participants	LREs in total	LREs with 'elaborate engagement'	LREs with 'limited engagement'
Pair 6 Jiyoung/Walter	93 (100%)	57 (61%)	36 (39%)
Pair 5 Lucie/Yuki	28 (100%)	19 (68%)	9 (32%)
Pair 4 Brian/Po	25 (100%)	13 (52%)	12 (48%)
Par 2 Kasumi/Sky	22 (100%)	11 (50%)	11 (50%)
Pair 1 Tessie/Yujin	13 (100%)	2 (15%)	11 (85%)
Pair 3 Sherry/Stephanie	7 (100%)	4 (57%)	3 (43%)
Pair 7 Rena/Rita	4 (100%)	2 (50%)	2 (50%)
Total	192 (100%)	108 (56%)	84 (44%)

As evidenced in Table 6.5, Pair 6 (Jiyoung/Walter) demonstrated effective engagement in language learning by initiating the largest number of LREs showing 'elaborate engagement', which Storch (2008) asserts is more effective for language learning than LREs with 'limited engagement'. The pair initiated as many as 57 LREs with 'elaborating engagement' by producing the most LREs among the seven pairs (n=93). Pair 5 (Lucie/Yuki), Pair 4 (Brian/Po), and Pair 2 (Kasumi/Sky) also initiated more LREs showing 'elaborate engagement' than Pair 1 (Tessie/Yujin), Pair 3 (Sherry/Stephanie), and Pair 7 (Rena/Rita) did. What is worthwhile to

note here is that some pairs initiated a higher percentage of LREs with 'elaborate engagement' even though they initiated fewer LREs. For example, 68% of the LREs (n=19) initiated by Pair 5 (Lucie/Yuki) were with 'elaborate engagement' even though they initiated fewer LREs with 'elaborate engagement' (n=19) compared to Pair 6 (Jiyoung/Walter) (n=57, 61%). On the other hand, 85% of the LREs initiated by Pair 1 (Tessie/Yuji) were with 'limited engagement' even though their pair initiated 13 LREs in total.

6.2.2 LREs with 'elaborate engagement'

Storch (2008) defines LREs showing 'elaborate engagement' as when "participants deliberated over the language items, sought and provided confirmation and explanations, and alternatives" (p. 100). Two excerpts in this section are provided to demonstrate how short LREs with 'elaborate engagement' still provide the participants with linguistic information to help them achieve an in-depth understanding of the language usage and meaning.

Excerpt 1 occurred during the writing stage of the project when Pair 6 (Jiyoung/Walter) were writing a sentence to describe ethnic diversity in Australia. Walter initiated Excerpt 1 to remind Jiyoung of Japanese particle usage, 'や (*ya*) 'and 'と (*to*)' to construct a below Japanese sentence:

A sentence Pair 6 (Jiyoung/Walter) is discussing in Excerpt 1
オーストラリアの歴史にとって、オーストラリア人は中国**や**アボリジニーの文化に慣れることができました。

Jiyoung appropriately used particle 'や (*ya*)' to list examples.

Research translation of the above sentence
For Australian history, Australian have accepted (different) culture **such as** Chinese **and** Aborigines.

Jiyoung appropriately used particle 'や (*ya*)' to list examples.

Usage of 'や (*ya*) 'and 'と (*to*)' has a similar function to listing several things, but they have different connotations: listing examples ('や (*ya*)') or listing every example ('と (*to*)')[25]. For example, if the learner writes the above sentence as, '中国とアボリジニーの文化を受け入れてきた' using 'と (*to*)', it means '(Australians) have accepted (only) Chinese and Aboriginal cultures'. However, if the learner writes the sentence as '中国やアボリジニーの文化を受け入れてきた' using 'や (*ya*)', it states '(Australians) have accepted different cultures such as Chinese and Aborigines (as well as cultures from other countries and ethnic groups)'. Remembering the different connotations of 'や (*ya*)' and 'と (*to*)', Walter deliberated his usage of the Japanese particles, 'や (*ya*)' and 'と (*to*)' to Jiyoung in Turn 1 to help Jiyoung choose a particle which best fit her intended meaning. Building upon Walter's explanations for the both usages, Jiyoung described the reason why she thought using 'や(*ya*)' was more appropriate in the sentence in Turn 2. Thus, Excerpt 1 demonstrates how a short LRE with 'elaborate engagement' helps a learner to choose an appropriate particle to deliver an intended meaning by understanding the different connotations of both particles.

Excerpt 1

1. Walter: ((Explaining different usages of Japanese particle, 'や (*ya*) '、'と (*to*)' to Jiyoung))
   When you use 'や (*ya*)', you are listing. You are not gonna list everything. If you use 'と (*to*)', you list everything.
2. Jiyoung: (Using 'や(*ya*)' in this sentence) must be better. Then 'や (*ya*)' is better as we are listing many types of people ethnicity.

[25]Usage of 'や (*ya*)' and 'と (*to*)' can be found in pages 28-30 at Iori, I., Takashina, S., & Yamada, T. (2000). *Shokyū o oshieru hito no tameno Nihongo hando bokku* [A Japanese grammar handbook for people teach beginners]. Tokyo: 3A Corporation.

Excerpt 2 is another short example which shows the classification as LREs with 'elaborate engagement'. Excerpt 2 occurred when Yujin (Pair 1) was correcting a script which Tessie had written at home during the writing stage (see Appendix 14). Image 6.3 shows part of her script. The linguistic problems Tessie encountered in the below script relate to her attempt to use past form to describe the characteristics of a Japanese festival held every year.

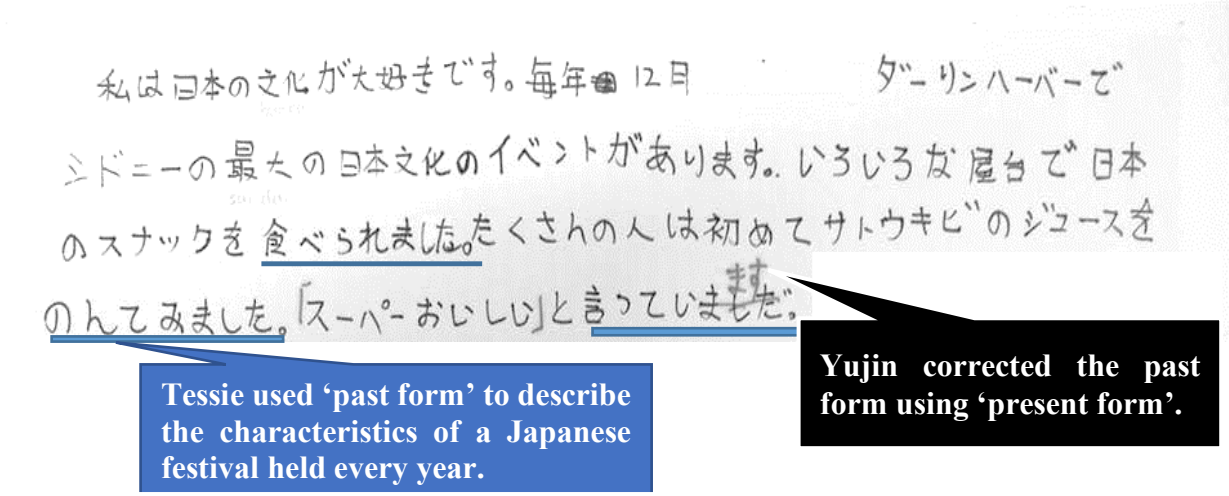


Image 6.3: A part of Tessie's script written at home

Research translation of the above script[26]

I like Japanese festivals very much. Every year in December, Darling Harbour has the largest Japanese festival in Sydney. (We) **could eat** many Japanese snacks at various street vendors. Many people **tried to drink** a sugar cone juice for first time. (They) **said** super tasty.

Tessie used 'past form' to describe the characteristics of a Japanese festival held every year. → **Yujin corrected the past form using 'present form'.**

[26] I translated the above script based on Tessie's original sentences. She inappropriately used the past form to describe the characteristic of a Japanese festival held every year. Yujin corrected her script with the present form.

In Turn 1, Yujin recommended that Tessie use the 'present form' to describe the festival in the following text. Because Yujin did not explain the reasons for this recommendation, Tessie requested clarification on this point from Yujin in Turn 2. Responding to her question, Yujin explained that the reason for using the 'present form' is because Tessie is describing the characteristics of a Japanese festival held every year. Despite the briefness of the LRE, Yujin's linguistic explanation in Turn 3 prompted Tessie to write the rest of the section using 'present form' because she understood the reason why 'present form' was more suitable.

Excerpt 2

1. Yujin: ((Looked at Tessie's script she has written at home)) Can you use present form (for your section)?
2. Tessie: Why?
3. Yujin: As you describe the festival held every year.

6.2.3 LREs with 'limited engagement'

'Limited engagement' LREs are defined as those in which the "participants simply stated the linguistic item without further deliberation" (Storch, 2008, p. 100). In contrast to LREs with 'elaborate engagement', LREs with 'limited engagement' do not have accompanying linguistic deliberations to expand understanding of the meaning and usage. This section provides two excerpts to demonstrate how the LREs with 'limited engagement' used by the participant pairs provided just enough information to resolve their immediate language problems to complete the on-going task.

Excerpt 3 occurred when Pair 1 (Tessie/Yujin) was at the end of the modifying stage. To read *kanji* words in their script with an accurate pronunciation, a less proficient learner, Tessie,

sought confirmation from Yujin on how to pronounce the *kanji* words written.

Excerpt 3

1.Tessie: ((Pointing '日本舞踊 (*nihon buyō)*'(Japanese traditional dance) to ask how to pronounce the word))

2.Yujin: ((Pronounced the *kanji* word for Tessie.)) '日本舞踊 (*Nihon buyō)*'(Japanese traditional dance). ((Yujin typed the pronunciation to Tessie's laptop.))

3.Tessie: '日本舞踊 (*Nihon buyō)*'(Japanese traditional dance).

Tessie initiated Turn 1 by asking Yujin how to pronounce '日本舞踊 (*nihon buyō)*' (Japanese traditional dance) by pointing to the script on her laptop screen (Image 6.4). Yujin responded to her question by pronouncing the word and by typing out the pronunciation to Tessie's laptop (Image 6.5). Understanding the pronunciation of '日本舞踊'(Japanese traditional dance) as '*nihon buyō*', Tessie also pronounced the word in the immediate turn. Thus, Excerpt 3 demonstrated how a brief LRE discussion with Yujin resolved Tessie's immediate language problem; how to pronounce '日本舞踊 (*nihon buyō)*'(Japanese traditional dance) in Japanese.

Image 6.4: Tessie (right) pointed to her laptop screen to ask Yujin (left) how to pronounce '日本舞踊 (*nihon buyō)*'(Japanese traditional dance)

Image 6.5: Yujin (left) typed the pronunciation of '日本舞踊(*nihon buyō)*'(Japanese traditional dance) for Tessie (right)

Excerpt 4 was observed when Sky (Pair 2) was giving Kasumi suggestions on how to revise her section during the modifying stage. Image 6.6 shows the revised sentence suggested by Sky in Excerpt 4. The linguistic problem manifested in Image 6.6 is Kasumi's confusion over the usage of 'まだ'(yet) and 'もう'(already). To state, 'as I have not been to Melbourne yet' using 'まだ'(yet), the sentence should be written as 'まだメルボルンにいったことがないので'(as I have not been to Melbourne yet). As an alternative expression, Kasumi could have written the sentence using 'もう'(already) such as 'もうメルボルンに行ったことがあるので'(as I have already been to Melbourne)[27]. However, in the sentence in Image 6.6, Kasumi became confused by the both expressions and conjugated '行く'(go) as メルボルンへまだ行ったので'(As I have been to Melbourne yet).

[27] Usage of 'まだ'(not yet) and 'もう'(already) can be found in pages 43-47 at Iori, I., Takashina, S., & Yamada, T. (2000). *Shokyū o oshieru hito no tame no Nihongo hando bokku* [A Japanese grammar handbook for people teach beginners]. Tokyo: 3A Corporation.

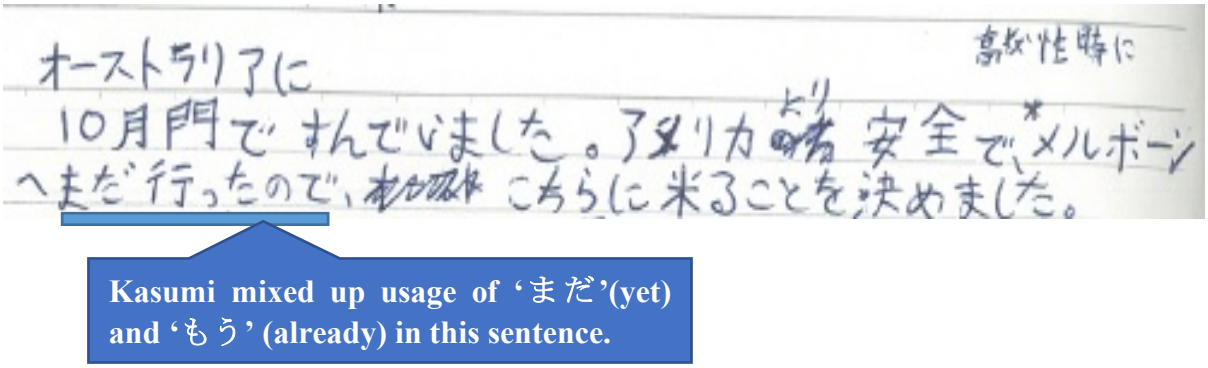


Image 6.6: Part of Kasumi's script

Researcher translation of the above sentence

I have lived in Australia for 10 months. I decided to come (to Sydney) as (I thought) Australia is safer than the USA and (another reason I chose to study in Australia was because) I **have been to** Melbourne **yet** when I was a high school (student).

Kasumi mixed up usage of ‘まだ’(yet) and ‘もう’(already) in this sentence.

Excerpt 4

1. Kasumi: What is the one thing (I should correct in my script)?

2. Sky: ((Reading a script written by Kasumi and suggesting to replace ‘まだ行ったので’((I) have been yet) with ‘もう行ったので’(as (I) have already been to)) ‘もう行ったので’(As I have already been to (Melbourne).

3. Kasumi: Okay.

4. Sky ((Returned Kasumi's script to her))

Confused by usages of ‘まだ’(yet) and ‘もう’(already), Kasumi utilised an inappropriate Japanese expression, ‘まだ行ったので’(as (I) have been (to Sydney) yet) for ‘まだメルボルンにいったことがないので’(as (I) have not been to Melbourne yet) or ‘もうメルボルンに行ったことがあるので’(as (I) have already been to Melbourne). Therefore, Sky suggested that Kasumi replace the expression with ‘もう行ったので’(as (I) have already been (to

Melbourne)) in Turn 2 without deliberating on the different connotation and usages of ‘もう’(already) and ‘まだ’(yet). Therefore, the short LREs discussion with Sky resolved Kasumi’s immediate language problems; using ‘もう’(already) to state ‘as (I) have already been to’ instead of using ‘まだ’(yet). However, the LREs with limited engagement did not help Kasumi to understand the different connotation and usage of ‘もう’(already) and ‘まだ’(yet). Thus, Excerpt 4 suggested that some LREs with limited engagement are useful to resolve only his or her immediate language problems but to understand how to use the expressions appropriately in different contexts.

6.2.4 Summary of the LREs with different engagement levels

To sum up, this section compared the quality of LREs discussed by the seven participant pairs by focusing on ‘level of engagement’ (Storch, 2008). The result showed that the seven pairs initiated LREs with ‘elaborate engagement’, which Storch (2008) has asserted are more effective for language learning, to different extents. Pairs 4-6 demonstrated effective engagement in language learning by discussing a greater number of LREs with ‘elaborate engagement’ which provided in-depth linguistic explanations so that peers could construct appropriate Japanese expressions by understanding the different connotations and usage. On the other hand, Pairs 1-3, 7 manifested their less effective engagement in language learning in collaborative dialogue by initiating fewer LREs with ‘elaborate engagement’. In particular, 85% of LREs (n=11) discussed by Pair 1 (Tessie/Yujin) were with ‘limited engagement’ which provided only just enough linguistic information to resolve their immediate linguistic problems without understanding different connotations and conjugation rules of similar expressions. The findings suggested Pairs 4-6 constructed more favourable conditions for language learning in collaborative dialogue by initiating more LREs with ‘elaborate engagement’ than Pairs 1-3, 7 did.

6.3 Outcomes of LREs discussion

The number of LREs correctly resolved is a useful predictor of whether learners can also correctly resolve the same language items discussed in collaborative dialogue in the tailer-made post-test (see details in Williams, 2001). Section 6.3.1 further compares the quality of LREs discussed by the seven pairs by examining distribution of LREs discussion outcomes; correctly resolved, incorrectly resolved, and unresolved (Lesser, 2004; Swain, 1998). Section 6.3.2 will discuss the reasons why LREs were not resolved.

6.3.1 Distribution of LREs correctly resolved, incorrectly resolved, and unresolved

To compare the outcomes of LREs discussion by the seven pairs, total of the 192 LREs were coded classified either into 1) LREs correctly resolved; 2) LREs incorrectly resolved; and 3) unresolved LREs (Lesser, 2004; Swain, 1998). Table 6.6 indicates the distribution of LREs correctly resolved, incorrectly resolved and unresolved per pair. As Table 6.6 indicates, 69% of LREs (n=132) were correctly resolved by the seven pairs. 22% of LREs (n=42) were incorrectly resolved, whereas 9% of LREs (n=18) were unresolved.

Table 6.6: Number of LREs resolved and unresolved

Participants	LREs in total	Resolved LREs (%=per total LREs produced by the pair)	Others	
			Unresolved LREs	LREs incorrectly resolved
Pair 6 Jiyoung/Walter	93 (100%)	63 (68%)	5 (5%)	25 (27%)
Pair 5 Lucie/Yuki	28 (100%)	25 (89%)	3 (11%)	0 (0%)
Pair 4 Brian/Po	25 (100%)	18 (72%)	6 (24%)	1 (4%)
Par 2 Kasumi/Sky	22 (100%)	8 (36%)	0 (0%)	14 (64%)
Pair 1 Tessie/Yujin	13 (100%)	12 (92%)	1 (8%)	0 (0%)
Pair 3 Sherry/Stephanie	7 (100%)	5 (71%)	1 (14%)	1 (14%)
Pair 7 Rena/Rita	4 (100%)	1 (25%)	2 (50%)	1 (25%)
Total	192 (100%)	132 (69%)	18 (9%)	42 (22%)

As Table 6.6 shows, the number of LREs discussed by each pair positively correlated with the number of LREs they correctly resolved, except for Pair 2 (Kasumi/Sky). There was a large discrepancy in the number of LREs correctly resolved by each pair. Pair 6 (Jiyoung/Walter) correctly resolve the largest number of LREs (n=63, 68%), followed by Pair 5 (Lucie/Yuki) and Pair 4 (Brian/Po). Although Pair 3 (Sherry/Stephanie) initiated only seven LREs in total, 71% of these (n=5) were correctly resolved by them. On the other hand, Pair 2 (Kasumi/Sky) and Pair 7 (Rena/Rita) demonstrated difficulties in correctly resolving their

LREs. Pair 2 (Kasumi/Sky) resolved eight LREs (36%); whereas Pair 7 (Rena/Rita) correctly resolved only one LRE (25%).

6.3.2 Reasons why LREs were not resolved

As discussed above, 31% of LREs (n=60) were either 'LREs incorrectly resolved' or 'unresolved LREs (See Table 6.6). The results showed they remained unresolved due to the following three reasons: 1) 'participant's inability to provide appropriate suggestions'; 2) 'prioritising completion of other tasks over discussion of LREs with peers for language learning'; and 3) 'participant's inability to describe own language problems'. The following Table 6.7 shows the breakdown of the reasons for the unresolved LREs.

Table 6.7: Reasons why LREs were not resolved

	Participant's inability to provide appropriate suggestions	**Prioritising completion of other tasks over discussion of LREs with peers for language learning**	**Participant's inability to describe own language problems**	**Total of unresolved LREs**
The number of LREs	49 (82%)	8 (13%)	3 (5%)	60 (100%)

As Table 6.7 indicates, 82% of LREs (n=49) were not resolved due to 'participant's inability to provide appropriate suggestions'. Moreover, 13% of LREs (n=8) were not resolved because the participants 'prioritised completion of other tasks over discussion of LREs with peers for language learning'. Five percent of LREs (n=3) were not resolved because of 'participant's inability to describe own language problems' to receive the language assistance needed from their peer. Two excerpts are provided to demonstrate how LREs resulted in unresolved.

1) Participant's inability to provide appropriate suggestions

'Participant's inability to provide appropriate suggestions' was the most common reason why LREs were not resolved. Of the unresolved LREs (n=49), 82% were attributed to this reason. Excerpt 5 is an example of LREs incorrectly resolved due to 'participant's inability to provide appropriate suggestions'. The excerpt occurred during the modifying stage when Kasumi (Pair 2) was giving a suggestion on how to correct a sentence written by Sky (Image 6.7). In the sentence, Sky described the difficulties his Japanese friend experienced in Australia based on his interviews:

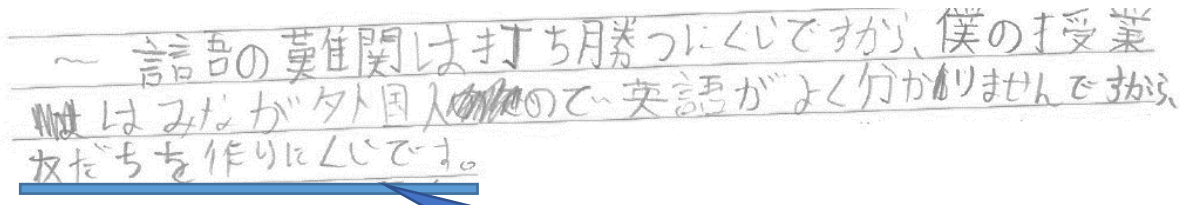


Image 6.7: Part of Sky's script

Sky wrote this sentence appropriately by using '作る' (make friends) which frequently collocates with '友達' (friends) to express 'make friends' in Japanese.

Research translation for the above sentence

As a language barrier is difficult to beat, as all of my class is foreigners, as I cannot understand English well, **it is difficult to make friends**.

Sky wrote this sentence appropriately by using '作る' (make friends) which frequently collocates with '友達' (friends) to express 'make friends' in Japanese.

The language problems Pair 2 (Kasumi/Sky) discussed in Excerpt 5 is how to express 'difficult to make friends' in Japanese. As seen in Image 6.7, Sky appropriately used '友達を作る'(make friends) to indicate 'difficult to make friends (in Australia) due to limited English proficiency'. He use frequent collocation words; '友達'(friends) and '作る'(make) to indicate 'make friends'[28]. Despite his appropriate usage of '友達を作る'(make friends), Kasumi inappropriately suggested replacing '作る'(make) with '出会う'[29](meet (the person by incidence)) in Turn 1.

Excerpt 5

1. Kasumi: ((Reading Sky's script and advising how to modify his sentences))

   '友達を'(Friends) then you said '作り'(verb stem form for 'make'). But I think you need to say '出会い'(verb stem form for 'meet (by incident)').

2. Sky: '出会い'((Verb stem form for 'meet (by incident)')) umm.

3. Kasumi: ((You should use)) '出会いにくいです'(Difficult to meet (by incident)).

   Otherwise actually it sounds like you are creating your friends from a piece of body part. But '出会う'(find) is to 'meet someone' by chance.

[28] Word collocation for '友達を作る'(make friends) can be confirmed at Japanese written language corpus, '少納言 *(Shōnagon)*', (http://www.kotonoha.gr.jp/shonagon/search_form). The corpus showed 14 sample sentences using '友達を作る'(make friends) (January 14, 2018).

[29] Both expressions, '友達を作る'(make friends) used by Sky and '友達に出会う'(meet friends (by incident) suggested by Kasumi as a replacement are appropriate as Japanese expressions. However, '友達に出会う' stressed the incident to 'meet friends'; whereas '友達を作る' means 'make friends' in a general sense. See usage of '出会う' at https://jisho.org/search/%E5%87%BA%E4%BC%9A%E3%81%86

‘出会う’(Meet (by incident)) suggested for use by Kasumi in Turn 1 has the connotation to meet the person ‘by incidence’. On the other hand, Image 6.7 shows Sky used ‘友達を作る’ (make friends) in a general sense to describe his Japanese friend who had difficulties making friends in Australia due to his limited English. Therefore, Kasumi’s suggested expression conveyed a different meaning to what Sky intended to express. However, Sky showed his agreement with her suggestion in Turn 2 by saying that “‘出会い’(verb stem form for ‘meet (by incident)’) umm”. Another issue with Kasumi’s suggestion in Excerpt 5 was that it provided an inappropriate reason for not using ‘友達を作る’(make friends); ‘友達を作る’(make friends) sounds like ‘creating your friends from a piece of body part’. Thus, Pair 2’s LRE discussion of ‘友達を作る’(make friends) in Excerpt 5 lead them to incorrectly resolve the LREs despite their effort to improve the linguistic accuracy of Sky’s script.

The language problem discussed in Excerpt 5 was resolved with the help of Sky’s Japanese friend. After their self-correction attempt, Sky asked his Japanese friend to correct the Japanese errors in his script. His Japanese friend helped to correct ‘友達を出会いにくいです’(difficult to meet friends (by incident))’ to a common Japanese expression, ‘友達を作るのに苦労しました’((I) had difficulties making friends).

2) Prioritising completion of other tasks over discussion of LREs for language learning

Another prominent reason why LREs were not resolved was that the pair participants chose to ‘prioritise completion of other tasks over discussion of LREs with peers for language learning’. Of the unresolved LREs (n=8), 13% were due to the prioritisation of other tasks. Excerpt 6 exemplifies a context in which the participants demonstrated this outcome. It occurred during the story development stage when Pair 4 (Brian/PO) was discussing which

information they should include in the university dormitory section[30]. During interviews Brian has conducted to Japanese students, they listed 'banquet' organised by their university dormitory as one of most memorable experiences in Australia. Therefore, Brian initiated Turn 1 to suggest Po to describe dormitory banquet in the section.

Excerpt 6

1. Brian: そして寮でえっと。あーうん。たぶん大きいな晩御飯があった。

   Then, at dormitory well. Ah, umm. Probably (they) had a big dinner (at dormitory).

2. Po: '晩御飯'(Dinner)？

3. Brian: '全部'(All)。(Students in) a whole floor (in the university dormitory) having dinner together.

4. Po: あー寮にいっしょに住んでいる人たち。えっと何というの。

   Well, people living in dormitory together. Well, what do you call (it)?

5. Brian: Banquet. '次ね。'((Lets' move to) next (task)).

A language problem Brian has encountered in Turn 1 was not to know a Japanese expression for 'banquet'. As a strategy to resolve the language problem, Brian paraphrased banquet' as '大きいな晩御飯'(a big dinner) using a simplified Japanese expression. Despite his communication strategy, Po could not understand what Brian was trying to say by stating '大きいな晩御飯'(a big dinner). Therefore, Po sought clarification of what Brian meant by repeating '晩御飯?'(dinner) in Turn 2. Responding to Po's clarification request, Brian further

[30] This section can be viewed at
https://www.youtube.com/watch?time_continue=132&v=aCG0ZvarSAc
Why don't you study at an Australian university? / オーストラリアの大学に留学しよう！！(1:33-2:07)

described ‘大きいな晩御飯’(a big dinner) as ‘(students in) a whole floor (in the university dormitory) having dinner together’.

Once Po understood what Brian meant by ‘大きいな晩御飯’(a big dinner), he asked Brian for the equivalent Japanese word, ‘えっと何というの。’(Well, what do you call (it)?) in Turn 4. Brian could have tried to recall or to research the equivalent word in Japanese using the Internet. Instead, he provided the English word, ‘banquet’, in Turn 5 and then encouraged Po to go back to their discussion of the interview results.

What is worthwhile to note here is that discussing LREs with peers for language learning is not always the top priority for the pair participants while working on the long-term collaborative learning tasks. Indeed, to manage the long-term project efficiently, they may sometimes choose to prioritise the completion of other tasks over having a discussion of their language problems with peers for language learning.

6.3.3 Summary of LREs discussion outcomes

In this section, the quality of the LREs discussed by the seven pairs are compared by examining the number of LREs correctly resolved or left unresolved. The results showed Pairs 4-6 correctly resolved a greater number of LREs by discussing with peers than Pairs 1- 3, 7 did. The findings suggested that some pairs engaged in language learning in collaborative dialogue more efficiently than other pairs due to their abilities to correctly resolve LREs. This section also explored the reasons why some LREs were not resolved. ‘Participant’s inability to provide appropriate suggestions’ was the most common reason for an LRE were not resolved. However, the findings also highlighted that the time required to complete the learning task may impact how participants interact with peers during the task; discuss together and actively discuss LREs for language learning; or prioritise the completion of other tasks to use their time more efficiently.

6.4 Communication functions of LREs

The previous section compared the quality of LREs discussed by the seven participant pairs by focusing on the number of LREs correctly resolved or left unresolved. This section further explores the quality of the engagement in language learning undertaken by the seven pairs by focusing on the communication functions each LRE addressed. For the analysis, nodes coded as 'LREs' were further classified according the communication function each LRE served in collaborative dialogue. As a result, eight functions of LREs were identified: 1) requesting provision of a Japanese word or expression; 2) confirming a Japanese word or expression; 3) requesting explanation of a Japanese word or expression; 4) explaining a Japanese word or expression; 5) correcting a peer's word or expression; 6) providing a Japanese word or expression; 7) pointing out a peer's error; and 8) confirming pronunciation of *kanji* words. Section 6.4.1 explores the probability of each function triggering either LREs with 'elaborate engagement' or with 'limited engagement' by examining the distribution of each function per 'level of engagement' (Storch, 2008). Section 6.4.2 compares the quality of language learning engaged in by the seven pairs by analysing the distribution of LRE functions initiated by each pair.

6.4.1 Eight functions of LREs

Table 6.8 summarises the distribution of the eight LRE functions per 'level of engagement'. To explore the probability of each LRE function triggering either LREs with 'elaborate engagement' or with 'limited engagement', the number of each LRE function per 'level of engagement' was divided by the total number of LREs initiated by the seven pairs (n=192). Sixty LREs were left unresolved.

Table 6.8: Functions of LREs per level of engagement

	LREs with 'elaborate engagement'	**LREs with 'limited engagement'**	**Total**
1. Requesting provision of a Japanese word or expression	18 (9%)	11 (6%)	29 (15%)
2. Confirming a Japanese word or expression	17 (9%)	20 (10%)	37 (19%)
3. Requesting explanation of a Japanese word or expression	11 (6%)	4 (2%)	15 (8%)
4. Explaining a Japanese word or expression	9 (5%)	2 (1%)	11 (6%)
5. Correcting a peer's word or expression	6 (3%)	13 (7%)	19 (10%)
6. Providing a Japanese word or expression	5 (3%)	3 (2%)	8 (4%)
7. Pointing out a peer's error	5 (3%)	1 (0.5%)	6 (3%)
8. Confirming pronunciation of a *kanji* word	0 (0%)	7 (4%)	7 (4%)
9. Unresolved LREs	37 (19%)	23 (12%)	60 (31%)
Total	108 (56%)	84 (44%)	192 (100%)

As Table 6.8 shows the LREs were most frequently initiated for the purpose of 'confirming a Japanese word or expression' (n=37), followed by 'requesting provision of a Japanese word or expression' (n=29), and 'correcting a peer's error' (n=19).

Due to the small data number of LREs discussed in this study (192 LREs), there are some limitations to generalising the findings presented in Table 6.8 to other research contexts. However, the findings suggested that certain LRE functions were more likely to be initiated in either LREs with 'elaborate engagement' or with 'limited engagement' in this data. The functions which triggered slightly more LREs with 'elaborate engagement' in this data included LREs initiated for: 1) 'requesting provision of a Japanese word or expression; 2) 'requesting explanation of a Japanese word or expression'; 3) 'explaining a Japanese word or expression; and 4) 'pointing out a peer's error'. On the other hand, the findings from the data showed other functions developed LREs with 'limited engagement' at a slightly higher percentage. The LRE functions include 'correcting a peer's word or expression' and 'confirming pronunciation of a *kanji* word. However, the LREs initiated for 'confirming a Japanese word or expression' and 'providing a Japanese word or expression' were both developed a to a similar extent in this data.

Based on the analysis, Figure 6.1 was developed to visually represent the probability of LRE functions developing either LREs with 'elaborate engagement' or with 'limited engagement'. The LREs functions in the centre shows those which are more likely to develop LREs with both levels at a similar rate. The LRE functions on the left are those which are more likely to develop LREs with 'elaborate engagement'; whereas the LREs functions on the right indicates those which are more likely to develop LREs with 'limited engagement' at a slightly higher percentage.

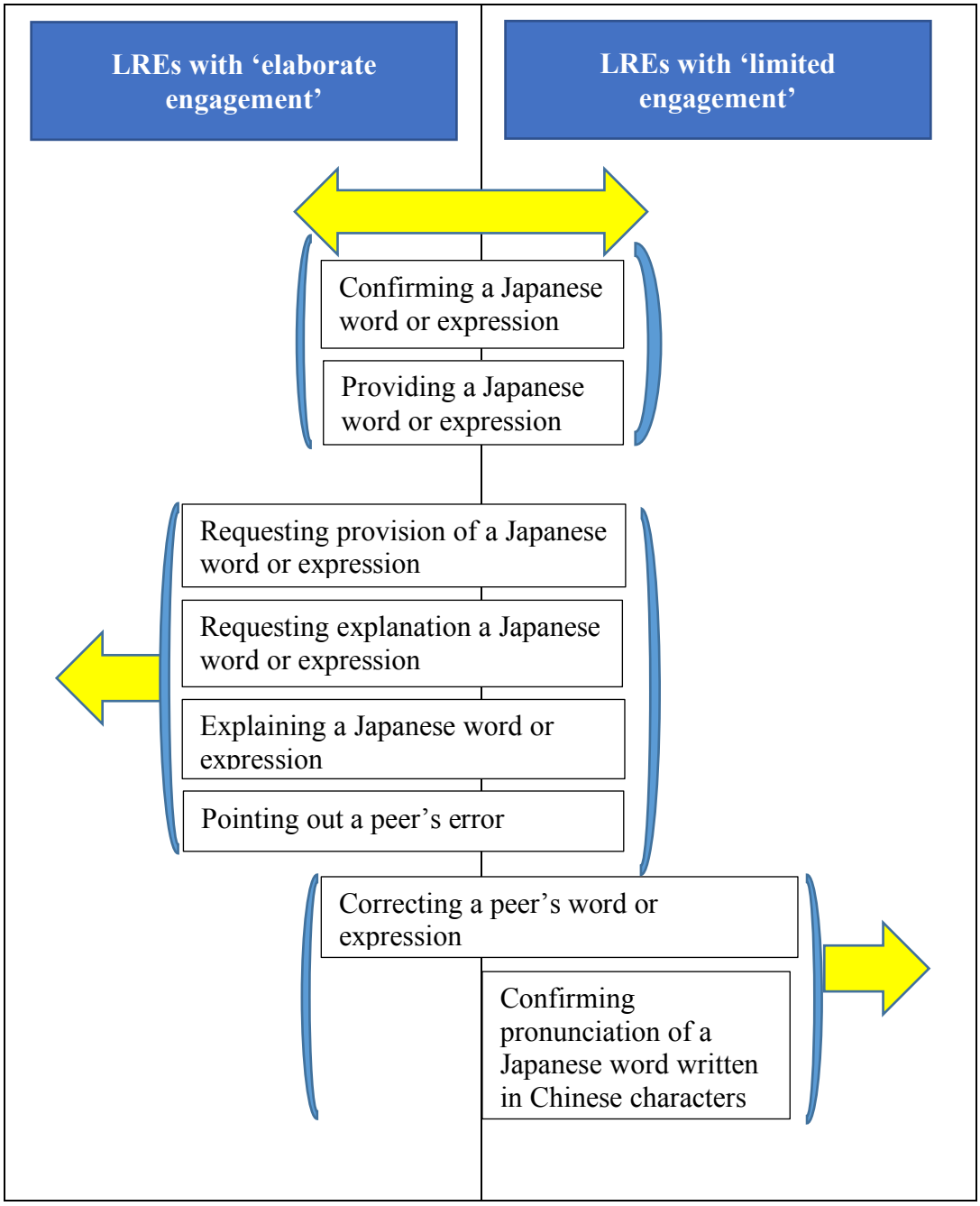


Figure 6.1: Relationship of LREs function and level of engagement

6.4.2 Distribution of LRE functions per pair

The results showed that the seven participant pairs initiated different LRE functions to greater or lesser levels. Table 6.9 shows the distribution of LRE functions discussed by each pair:

Table 6.9: Functions of LREs initiated by the seven pairs

Functions of LREs		Pair 1	Pair 2	Pair 3	Pair 4	Pair 5	Pair 6	Pair 7
1. Requesting provision of a Japanese word or expression		2 (15%)	0 (0%)	1 (14%)	5 (20%)	10 (36%)	10 (11%)	1 (25%)
2. Confirming a Japanese word or expression		1 (8%)	1 (5%)	2 (29%)	6 (24%)	12 (43%)	15 (16%)	0 (0%)
3. Requesting explanation of a Japanese word or expression		3 (23%)	0 (0%)	2 (29%)	1 (4%)	1 (4%)	8 (9%)	0 (0%)
4. Explaining a Japanese word or expression		2 (15%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	9 (10%)	0 (0%)
5. Correcting a peer's word or expressions		0 (0%)	6 (27%)	0 (0%)	1 (4%)	1 (4%)	11 (12%)	0 (0%)
6. Providing a Japanese word or expression		0 (0%)	0 (0%)	0 (0%)	2 (8%)	0 (0%)	6 (6%)	0 (0%)
7. Pointing out a peer's error		0 (0%)	0 (0%)	0 (0%)	2 (8%)	0 (0%)	4 (4%)	0 (0%)
8. Confirming pronunciation of a *kanji* word		4 (31%)	1 (5%)	0 (0%)	1 (4%)	1 (4%)	0 (0%)	0 (0%)
9. Others	**Unresolved LREs**	1 (8%)	0 (0%)	1 (14%)	6 (24%)	3 (11%)	5 (5%)	2 (50%)
	LREs incorrectly resolved	0 (0%)	14 (64%)	1 (14%)	1 (4%)	0 (0%)	25 (27%)	1 (25%)
Total		13	22	7	25	28	93	4

As Table 6.9 indicates, different pairs initiated different LRE functions to different extents. Pairs 4-6 frequently initiated LREs for 'requesting provision of a Japanese word or expression' and 'confirming a Japanese word or expression'. On the other hand, Pair 3 (Sherry/Stephanie) often initiated LREs for 'requesting explanation of a Japanese word or expression' as well as for 'confirming a Japanese word or expression'. Pair 2 (Kasumi/Sky) frequently initiated LREs for 'correcting peer's expressions' during the modifying stage. The LRE function most frequently initiated by Pair 1 (Yujin/Tessie) was for 'confirming pronunciation of a *kanji* word'.

6.4.3 Summary of LRE functions

This section first provided the eight LRE functions the seven participant pairs addressed in collaborative dialogue with peers. The probability of each LRE function triggering either LREs with 'elaborate engagement' or with 'limited engagement (Storch, 2008) was then explored. Due to the small data sample, the findings discussed in this section cannot be generalised to other research contexts. However, the findings suggested that some functions are more likely to develop LREs with 'elaborate engagement' which Storch (2008) has asserted to be effective for language learning.

What is worthwhile to note here is that some pairs demonstrated engagement in language learning more effectively than other pairs by initiating a greater number of LRE functions more likely to develop LREs with 'elaborate engagement'. Pairs 4, 5, 6 frequently initiated LREs which triggered LREs with 'elaborate engagement' at a slightly higher rate; namely, 'requesting provision of a Japanese word or expression' (Pair 4-6) or 'requesting explanation of a Japanese word or expression' and 'explaining a Japanese word or expression' (Pair 6). On the other hand, Pair 1 and Pair 2 initiated LRE functions which developed LREs with 'limited engagement' at a slightly higher percentage in this data; namely, 'correcting a peer's expression'

(Pair 2) or 'confirming pronunciation of a *kanji* word' (Pair 1). In other words, Pairs 4-6 engaged in language learning in more effective manner than Pairs 1-3 and 7 by initiating more LRE functions likely to develop LREs with 'elaborate engagement' at a slightly higher rate.

6.5 Comparing LRE functions per engagement level

Section 6.4 examined the quality of language learning engaged in by the seven pairs by analysing the distribution of LREs function quantitatively. This section compares how each LRE function initiated with different engagement level provides different types of language learning opportunities to the seven pairs by analysing their LREs qualitatively. As discussed in 6.4, eight LRE functions were identified in this study, however this section compares the five LRE functions frequently observed in different engagement levels; 1) confirming a Japanese word or expression; 2) requesting provision of a Japanese word or expression; 3) requesting explanation of a Japanese word or expression; 4) correcting a peer's error; and 5) confirming pronunciation of a *kanji* word.

6.5.1 Confirming a Japanese word or expression

'Confirming a Japanese word or expression' was the LRE function most frequently initiated by the seven participant pairs (n=37) (See Table 6.8). They initiated this type of LRE to confirm whether a Japanese word or expression they wished to use was appropriate or whether the they correctly understood the meaning of a Japanese word. The LREs initiated for the function developed either LREs with 'elaborate engagement' or with 'limited engagement to a similar extent; that is, 9% (n=17) and 10% (n=20), respectively.

When the LREs with 'limited engagement' were initiated for 'confirming a Japanese word or expression', the peer replied with a brief response showing agreement or by providing the correct expression. Excerpt 7 provides an example of an LRE showing these characteristics. It occurred during the modifying stage while Sherry (Pair 3) was reading aloud their script to identify the sections the pair should revise. In Excerpt 7, Sherry initiated Turn 1 to confirm whether a concluding sentence in their introduction[31] she had revised was the appropriate use of Japanese. In Turn 3, Sherry then reformulated the sentence delivered in Turn 1 to 'ちょっと調べに行きましょう。' (Let's go to investigate). In the following turn, Stephanie showed her agreement with the new sentence by saying, "Yeah, that makes more sense". However, she did not further elaborate the reasons why she thought the revised sentence was more appropriate as Japanese.

Excerpt 7

1 Sherry: ((Reading aloud their script)) '今日はちょっと調べてみましょう。'(Today let's try to investigate).

2. Stephanie: ((Listening to Sherry's reading))

3. Sherry: ((Changing the sentence)) 'ちょっと調べに行きましょう。'(Let's go to investigate). Let's go to look into it.

4. Stephanie: Yeah, that makes more sense.

[31] This section can be viewed at
https://www.youtube.com/watch?time_continue=3&v=UVxqql5vi30
'シドニーで体験できる日本'(Japanese you can experience in Sydney) (0:00-0:28)

As Excerpt 7 suggests, in LREs with 'limited engagement', peers provide a brief response to the confirmation question without deliberating the language use. On the other hand, when LREs with 'elaborate engagement' are initiated for 'confirming a Japanese word or expression', peers not only provide the alternative word or expressions, but also clarify the sematic meaning and the reason why the expression is appropriate as Japanese.

Excerpt 8 presents an example of LREs with 'elaborate engagement' representing the above-mentioned characteristics. It occurred when Pair 5 (Lucie/Yuki) was discussing what dialogue to include in their introduction[32]. In Excerpt 8, Lucie initiated Turn 1 to confirm whether a sentence she had constructed for their introduction was appropriate as Japanese; 'まだ考えているの。日本について。' (Are you still thinking? About Japan?).

Excerpt 8

1. Lucie: 'まだ'(Still). How do we say 'まだ考えて'(still think)

2. Yuki: //'考えて'(Think)//

3. Lucie: //'考えているの'(Are (you) thinking?)// Are (you) still thinking?

4. Yuki: Yeah.

5. Lucie: '日本について'(About Japan) or something.

[32] This section can be viewed at https://www.youtube.com/watch?v=mj40cQGkozM
Memories of four seasons in Japan (Yuki and Lucie) (0:00-0:20)

6. Yuki: ‘まだ日本について、日本のことについて or 日本について’(Still about Japan. Things about Japan. Or about Japan）because ‘日本について’(about Japan) implies you think about, like, the country of Japan." But if you ((silent for one second 24)).

7. Lucie: But could you say

8. Yuki: ‘日本のことについて’(Things about Japan) implies that there's more of an experience. What do you think?

9. Lucie: Oh. I'm not sure on the Japanese, but start off with like, ‘Do you ever think about it? About Japan,’ might sound more interesting than, ‘Do you ever think about Japan?’

10. Yuki: Yeah.

In Turns 1, 3, 5, Lucie sought confirmation from Yuki whether ‘まだ考えているの。日本のこと。’(Are (you) still thinking? About Japan?) is an appropriate expression in Japanese. Responding to Lucie’s confirmation requests, Yuki first provided Lucie with three alternative expressions in Turn 6: 1)‘まだ日本について’(still about Japan); 2)‘日本のことについて’(things about Japan); and 3)‘日本について’(about Japan). Yuki then clarified the semantic differences of these expressions in Turns 6 and 8 so that Lucie could choose the expression which best delivers her intended meaning based on her understanding of the sematic differences.

Thus, Excerpt 8 demonstrates that LREs with 'elaborate engagement' initiated to 'confirm a Japanese word or expression' encourages a learner to choose the best expression to deliver her intended meaning by providing alternative expressions along with their sematic meaning.

6.5.2 Requesting provision of a Japanese word or expression

'Requesting provision of a Japanese word or expression' was the second most frequently initiated LRE by the seven participant pairs. They initiated LREs for this function when they wished to use a word or expression in their script, but did not know how to say it in Japanese. This LRE function elicited slightly more LREs with 'elaborate engagement' than LREs with 'limited engagement', at 9% (n=18) and 6% (n=11), respectively (See Table 6.8). When LREs with 'limited engagement' are initiated for 'requesting provision of a Japanese word or expression', the peer responds to the request by providing a Japanese word and an expression without deliberating the meaning and usage. Excerpt 9 presents an example of LREs with 'limited engagement' to demonstrate these characteristics. It was recorded when Tessie sought to confirm a Japanese expression she used in the traditional festival section[33]; '飲んでみる'(try to drink).

In Excerpt 9, Tessie initiated Turn 1 to ask Yujin how to say 'try to drink' in Japanese. Yujin could have further expanded their LRE discussion by deliberating the conjugation rule to construct the expression. However, in Turn 2 Yujin responded to Tessie's request by providing only a one-phrase translation in Japanese; '飲んでみる'(try to drink).

[33] This section can be viewed at https://www.youtube.com/watch?time_continue=112&v=chzz1Omg_ZU '日本文化のイベントin Sydney'(Japanese cultural events in Sydney) (0:00-1:52)

Excerpt 9

1. Tessie: How do you say ‘try to drink’?

2. Yujin: ‘飲んでみる’(Try to drink).

3. Tessie: ‘飲んでみる’(Try to drink).

As seen in Excerpt 9, LREs with ‘limited engagement’ initiated to ‘request provision of a Japanese word or expression’ are not accompanied by an in-depth linguistic explanation for the requested word or expression. The peer responded to the request by providing just the one-phrase translation instead of deliberating the meaning and usage of the Japanese word or expression. On the other hand, in LREs with ‘elaborate engagement’ initiated for this function, the peer elaborated the usage and meaning of the expression requested by his or her peer.

Excerpt 10 presents as an example of LREs with ‘elaborate engagement’ showing these characteristics. It was observed during the writing stage when Pair 6 (Jiyoung/Walter) was writing their description of ethnic diversity in Australia[34].

[34] This section can be watched at
https://www.youtube.com/watch?time_continue=82&v=4H7c6MLfE1g
‘マルチカルチャーのオーストラリア’(Multi-culture in Australia) (0:54-1:22)

In Excerpt 10, Walter was constructing the following Japanese sentence:

The sentence Walter was constructing in Excerpt 10
こうやって、他の国から来た人々は、オーストラリアでは、差別されません。

Walter does not know how to construct the Japanese expression, '差別されません' ((You) are not discriminated).

Researcher translation of the above sentence
In this way, people came from other countries **are not discriminated** in Australia.

Walter does not know how to construct the Japanese expression, '差別されません' ((You) are not discriminated).

To construct the Japanese sentence shown in Excerpt 10, Walter had to overcome two language problems; 1) finding out how to say 'discrimination' in Japanese; and 2) understanding how to conjugate 'discriminate' using the passive form.

Excerpt 10

1. Walter: 'オーストラリアに来て'(After (I) came to Australia) (how do you say) discrimination (in Japanese)?
2. Jiyoung: ((Thinking for a while)) umm.
3. Walter: ((Trying to recall Japanese word for 'discrimination)) '差別'(Discrimination). '差別'(Discrimination). '差別'(Discrimination). Is that discrimination?

4. Jiyoung: I guess so. ‘差別’(Discrimination) is discrimination. You were discriminated. I remember. I can check (the word by consulting with dictionaries). ((Looking and reading Walter’s meme) ‘差別には(なりません)’(It does not (become discrimination/it’s not considered as discrimination)).

5. Walter: ‘差別にはなりません’(It does not become discrimination). Is that?

6. Jiyoung: ‘差別されない’((People came from other countries) are not discriminated)). ‘差別’(Discrimination) is like discrimination. You were not discriminated.

7. Walter: Yeah, amm.

8. Jiyoung: ‘差別はならない’((It) does not become discrimination.) And you are saying you are not becoming (discrimination).

9: Walter: ‘差別をされ(ない)’((People came from other countries) are (not) discriminated).

10. Jiyoung: ‘差別をされない’((People came from other countries) are not discriminated). ‘差別はされない’((You) are not discriminated).

11. Walter: ((Joking the passive form with a smile)) ‘されされない。されされない。(*sare sarenai. Sare sarenai*)’.

12. Jiyoung: <hhh> It’s like passive.

Although some English words require speakers to use different word forms for nouns (e.g., discrimination) and verbs (e.g., discriminate), some Japanese expressions use the same form as a noun (e.g., '差別'(discrimination)) and as the object of a verb ('差別(を)する'(do discrimination)[35]. Therefore, Walter first sought confirmation on how to say 'discrimination' in Turn 1. Despite Walter's request, Jiyoung could not immediately recall the equivalent word in Japanese. Observing Jiyoung's struggle to recall the word in Turn 2, Walter tried to remember the word in Turn 3 by repeating the Japanese word he thought was correct; '差別' (discrimination). He then sought confirmation from Jiyoung as to whether '差別' (discrimination) in fact means 'discrimination'. Jiyoung showed her lack of confidence by saying, 'I can check (the word by consulting with dictionaries)'.

To express '(you are) not discriminated' in Japanese, Walter should have conjugated the verb, '差別をする'(discriminate), as '差別(を)される'(be discriminated) using the passive form. Not realising the conjugation rule, Walter constructed the expression, '差別にはなりません。'(It does not become discrimination/it's not considered as discrimination) which conveys a different message to the one he intended. Realising the semantic gap between Walter's intended meaning and the meaning of his erroneous conjugation form, Jiyoung clarified the sematic differences in Turns 6 and 8. Realising Walter's struggle to conjugate the passive form, Jiyoung provided the correct conjugation form in Turn 10; '差別をされない'((People came from other countries) are not discriminated).

[35] See the usage of '差別をする'(discriminate) at 'jisho'((the name of website is 'dictionary') https://jisho.org/search/%E5%B7%AE%E5%88%A5%E3%82%92%E3%81%99%E3%82%8B

As Excerpt 10 shows, LREs with 'elaborate engagement' initiated to 'request provision of a Japanese word or expression' provides to the participant not only the correct conjugation form, but also opportunities to discuss the sematic meaning of his erroneous expressions and the appropriate conjugation form.

6.5.3 Requesting explanation of a Japanese word or expression

The third function of LREs were initiated by the participant pairs to 'request explanation of a Japanese word or expression' they did not know. LREs with this function developed slightly more LREs with 'elaborate engagement' than LREs with 'limited engagement', at 6% (n=11) and 2% (n=4), respectively (see Table 6.8).

In LREs with 'limited engagement', pairs do not deliberate the meaning of the Japanese word or expression, but instead provide a one-word or one-phrase translation. Excerpt 11 presents an example demonstrating these characteristics. It occurred during the story development stage when Tessie (Pair 1) requested from Yujin an explanation of the Japanese word, '鯉'(a carp), which she saw on a Japanese website.

Excerpt 11

1. Tessie: ((Looking at an outline written by Yujin)) what is '鯉'(a carp)?

2. Yujin: '鯉'(A carp)? Fish.

In Turn 1, Tessie asked Yujin what '鯉?'(a carp) means. In Turn 2, Yujin could have provided the English equivalent word for '鯉'(carp) or further describe the characteristics of '鯉'(carp) so that Tessie could guess that '鯉'(a carp) means 'carp'. Despite the possibilities, Yujin instead provided the rough category; explaining that '鯉'(a carp) was a type of fish by providing one word in English, 'fish'. The pair then went back to their discussion of their story structure.

As seen in Excerpt 11, LREs with 'limited engagement' may be terminated once a peer provides a one-word or one-phrase translation. The LRE discussion does not expand beyond the one-word or one-phrase translation. However, in LREs with 'elaborate engagement', participants elicit detailed linguistic explanations from peers to understand a Japanese word or expression in-depth by asking several clarification questions over several turns.

Excerpt 12 shows an example of LREs with 'elaborate engagement' displaying these characteristics. It occurred during the writing stage when Walter (Pair 6) made the suggestion to introduce 'ロックプール'(a rock pool) in leisure section[36] as a popular leisure activity in Sydney. A rock pool is a sea water pool located in the rocky areas of beaches (Image 6.8). A lot of beaches in Sydney have a rock pool. Japanese websites introduce 'a rock pool' in Sydney by describing the word as 'ロックプール'(a rock pool) using *Katakana*; characters used to describe foreign origin words[37].

[36] This section can be watched at
https://www.youtube.com/watch?time_continue=171&v=4H7c6MLfE1g
'マルチカルチャーのオーストラリア'(Multi-culture in Australia) (1:57-2:50)

[37] Japanese websites describe 'a rock pool' as 'ロックプール'(a rock pool) using *Katakana*, characters used to describe foreign origin words. For example, the following websites describe 'rock pool' as 'ロックプール'(a rock pool).
https://ozvilogger-takako.com/bronte-rock-pool-1480
https://point-house.jp/article_detail.html/?id=2067

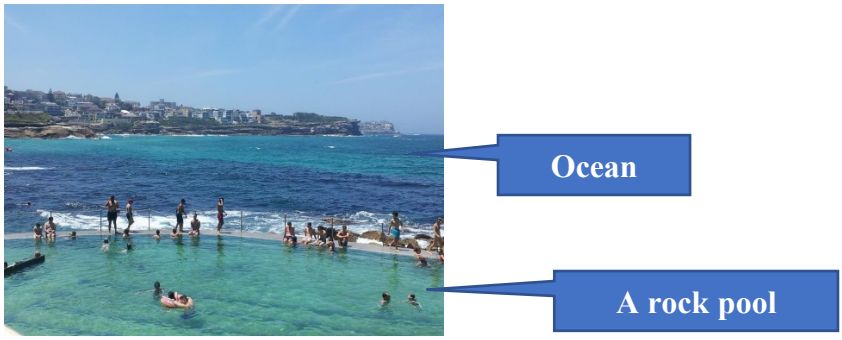


Image 6.8: A rock pool in Sydney

Jiyoung, a Korean immigrant, did not know the meaning of 'ロックプール'(a rock pool) in English or in Japanese, although she has lived in Sydney for six years. Therefore, she initiated Turn 2 in Excerpt 12 to ask Walter to explain the meaning of 'ロックプール'(a rock pool).

Excerpt 12

1. Walter: I mean, yeah, yeah. Playing in the sand, surfing, and that's cool. Yeah, that's Australia. The next one. What we have been missing is a rock pool.
2. Jiyoung: Rock pool?
3. Walter: Rock pool, you don't' know? Sometimes you have in beaches. In Sydney, a lot of beaches have rocky areas you can walk cross the rocks. Like a pool specifically made there. Which is
4. Jiyoung: Is that artificial?
5. Walter: Salted pool. No, it's pretty much salt water.
6. Jiyoung: Umm, Salt water?
7. Walter: Sea water.
8. Jiyoung: Oh, yeah.
9. Walter: Yeah, people can go there.
10: Jiyoung: We definitely need a picture for that.

Not knowing what a rock pool is, Jiyoung asked Walter to clarify its meaning by repeating 'rock pool' in Turn 2. Responding to Jiyoung's clarification request, in Turn 3 Walter described a rock pool as 'a pool made in rocky areas in beaches. However, in Turn 4 Jiyoung sought further confirmation of whether a rock pool was artificially made. The clarification question elicited an additional explanation of rock pool from Walter; that is, a rock pool uses salt water. In Turn 6, Jiyoung further clarified what Walter means by saying 'salt water'. The question encouraged Walter to further describe that rock pools use 'sea water' in Turn 7.

Thus, Excerpt 12 demonstrates that a series of active clarification questions by Jiyoung to Walter resulted in her eliciting an in-depth lexical meaning of 'ロックプール'(a rock pool) from her peer.

6.5.4 Correcting a peer's word or expression

The fourth function of LREs were initiated to 'correct a peer's word or expression' written in their script. LREs with this function were initiated when a participant spotted an inappropriate expression written by his or her peer either while monitoring what his or her peer was typing (Pair 6, See Image 6.9) or while providing feedback on his or her peer's script during the modifying stage (Pair 2, see Image 6.10). LREs initiated to 'correct a peer's expression' are more likely to develop LREs with 'limited engagement' than with 'elaborate engagement', at 7% (n=13) and 3% (n=6), respectively (See Table 6.8).

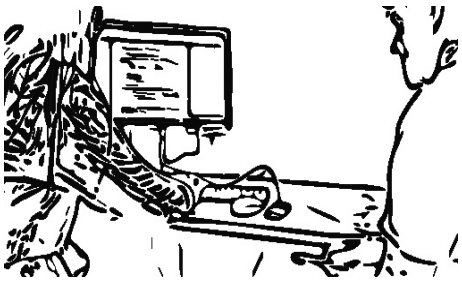


Image 6.9: When Jiyoung (left) was typing their script based on discussion with Walter (right), Waler pointed out her typing error when monitoring her computer screen

Image 6.10: Kasumi (right) showed Sky (left) how to correct his conjugation errors by writing the corrections in his script. Sky was monitoring how Kasumi corrected his script

In LREs with 'limited engagement' initiated to 'correct a peer's word or expression', participants briefly suggest how to modify a peer's expression, but do not deliberate the meaning or usage in-depth. Excerpt 13 provides an example of LREs with 'limited engagement' showing these characteristics. It occurred during the modifying stage when Kasumi (Pair 2) was providing feedback on the first section written by Sky[38]. Image 6.11 shows a sentence discussed by Pair 2 (Kasumi/Sky) in Excerpt 13. The linguistic problem Sky revealed in Image 6.11 is a conjugation error to modify a noun using an adjective; '大きい'(a big). As '大きい'(a big) has two conjugation forms; '*i*-adjective' and '*na*-adjective', Sky could have conjugated '大きい'(a big) either as '大きい国' or '大きな国' to state 'a big country'[39]. Despite the conjugation rule, he dropped 'い(*i*)' or 'な(*na*)' before the noun to modify '国'(country) in the sentence.

[38] This section can be seen at https://www.youtube.com/watch?time_continue=29&v=q_nKDBmBYNE Study in an Australian university: Stories of two Japanese international students (0:00-1:54)

[39] Conjugation rule for '大きい' (big) can be found in page 354 at Iori, I., Takashina, S., & Yamada, T. (2000). *Shokyūo oshieru hitono tame no Nihongo hando bokku* [A Japanese grammar handbook for people teach beginners]. Tokyo: 3A Corporation.

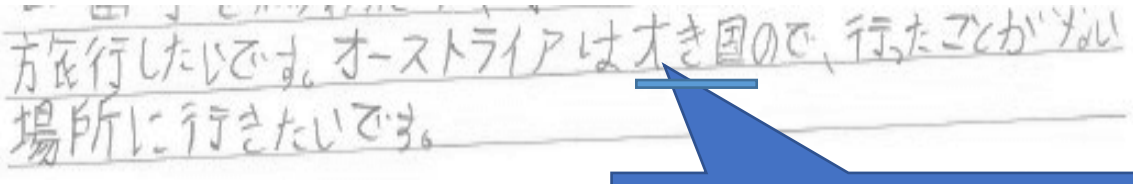


Image 6.11: A part of script written by Sky

Sky inappropriate dropped 'な (*na*)' in front of a noun, '国'(a country).

Researcher translation of the above sentence

As Australia is **'大き国'(a big country)**, I would like to go places I have never been to.

Sky inappropriately dropped 'な (*na*)' in front of a noun, '国'(a country).

Excerpt 13

1. Kasumi: ((Reading scrip written by Sky and suggesting him to insert 'な (*na*)' before '国'(a country) to modify the noun) 'オーストラリアは大きな'(Australia is a big (country).

2 Sky: ((Repeating conjugation form suggested by Kasumi)) 'な (*na*)'

As seen in Excerpt 13, when LREs with 'limited engagement' are initiated to 'correct a peer's expression, the learner only provides minimum linguistic information to correct their peer's erroneous expression. Hence, in-depth linguistic explanations for the corrections are not provided.

On the other hand, when LREs with 'elaborate engagement' are initiated to 'correct a peer's expression', the peer provides not only the correct expression, but also clarifies the usage of the Japanese expression to the confused participant. Excerpt 14 provides an example of LREs with 'elaborate engagement' displaying these characteristics. It occurred when Pair 6

(Jiyoung/Walter) was writing a sentence to describe ethnic diversity in Australia[40]. In Excerpt 14, Jiyoung was trying to construct the following Japanese sentence.

A sentence Jiyoung was constructing in Excerpt 14
ですから、世界のどこから来ても、誰であろうとも、オーストラリアで**は**、
あなたもオーストラリア人。

Jiyoung appropriately used the particle 'は (*wa*)' to contrast muticulturim in Australia and other countries.

Researcher translation of the above sentence
Therefore, wherever you come from in the world, whoever you are, **in** Australia, you also (become) an Australian.

Jiyoung appropriately used the particle 'は (*wa*)' to contrast multiculturalism in Australia to multiculturalism in other countries.

In Excerpt 14, the language problem the pair encountered is usage of the Japanese particle, 'は(*wa*)'. The particle is used to make a contrast when discussing a topic[41]. In the above sentence, Jiyoung appropriately used 'は(*wa*)' to contrast multiculturalism in Australia with multiculturalism in other countries. Despite her appropriate usage of 'は(*wa*)', in Turn 2, Walter inappropriately suggested to Jiyoung that she remove 'は(*wa*)' from the sentence.

[40] This section can be watched at
https://www.youtube.com/watch?time_continue=82&v=4H7c6MLfE1g
'マルチカルチャーのオーストラリア'(Multi-culture in Australia) (0:54-1:22)
In their final work, they revised the above sentence as 'あなたもオーストラリアに来たら、オーストラリア人です。'(If you come to Australia, You will be an Australian).

[41] Usage of particle 'は (*wa*)' can be found in page 11 at Tomomatsu, E, & Wakuri, M. (2004). *Tanki shūchū shokyū nihongo bunpō sō matome point 20* [Short period intensive Japanese grammar summary, point 20]. 3A Corporation: Tokyo.

Excerpt 14

1. Jiyoung: オーストラリアではあなたも

   In Australia, you

2. Walter: ‘オーストラリアで’(In Australia). I think.

3. Jiyoung: I am trying to make comparison to other countries. That’s why not any countries but in Australia. You can become an Australian.

4. Waler: You can change (it to) ‘で (*de*)’(in) cause it’s

5. Jiyoung: Sorry. Cause ‘は (*wa*)’ makes comparison. So ‘コーヒーは飲まないけど、ジュースは飲む’(Although I don’t drink coffee, I drink juice)。 So that like of things.

6. Walter: Okay.

Realising Walter’s misunderstanding of how to use ‘は(*wa*)’, in Turn 3 Jiyoung explained her reason for using it in the sentence; namely, to make a comparison between multiculturalism in Australia and multiculturalism in other cultures. Despite Jiyoung’ elaborate explanation, in Turn 4 Walter insisted that she drop the particle from the sentence. Therefore, in Turn 5 Jiyoung further clarified the usage by providing a sample sentence to show how the particle ‘は (*wa*)’ is used to make a comparison in a sentence. After listening to Jiyoung’s elaborate explanations and observing the sample sentence, Walter showed his understanding in Turn 6 by saying, “Okay”.

Thus, Excerpt 14 demonstrates that LREs with 'elaborate engagement' initiated to 'correct a peer's expression' encourages learners to understand how the word or expression is used by discussing the reasons for the need to correct the erroneous expression and by sharing a sample sentence.

6.5.5 Confirming pronunciation of a *kanji* word

The fifth function of LREs was produced when the participants 'confirmed pronunciation of a *kanji* word'. All LREs initiated to 'confirm pronunciation of a *kanji* word' developed LREs with 'limited engagement' (4%, n=7) (See Table 6.8). LREs initiated for this function did not encourage participants to further expand their LRE discussion beyond confirming the pronunciation of the Japanese words in question.

Excerpt 15 is provided to demonstrate the LREs with 'limited engagement' demonstrating these characteristics. It was observed when Tessie (Pair 1) was showing the word list to Yujin to confirm how to pronounce '書道 (*shodō*)'(calligraphy) in Japanese (See Image 6.12).

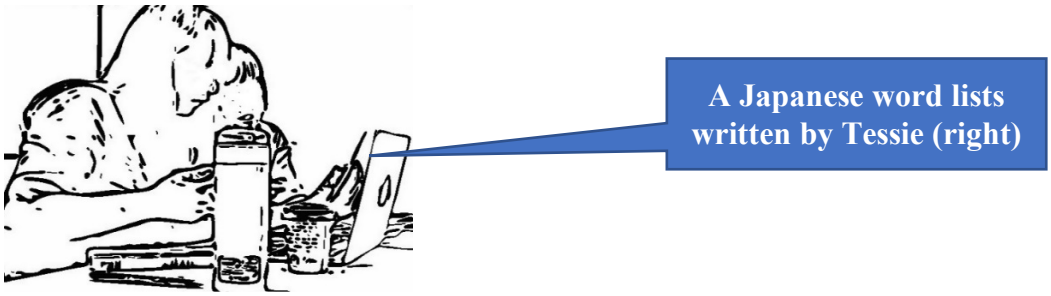


Image 6.12: Tessie (right) showed a list of Japanese words to Yujin (left)

Excerpt 15

1. Tessie: ((Tessie wrote lists of kanji words and asked Yujin the pronunciation by showing the list.)) pronounce to Yujin)) What's this?
2. Yujin: '書道 (*Shodō*)'(Calligraphy).

Tessie initiated Turn 1 to learn how to pronounce '書道 (*shodō*)'(calligraphy) in Japanese. Responding to Tessie's request, Yujin pronounced the word list for her in Turn 2. Yujin could have further expanded their LRE discussion beyond the single pronunciation response by sharing other pronunciations of the *kanji* or other Japanese words using the same *kanji*. Instead, the pair moved on to confirm the pronunciation of other Japanese words in Tessie's word list.

6.5.6 Summary of the LRE functions

This section examined the process of language learning engaged in by the seven participant pairs by comparing the functions of LREs initiated per 'level of engagement' (Storch, 2008). Previous studies have examined the efficiency of language learning where learners engaged in collaborative dialogue with peers by analysing the aspects of language discussed by each pair/group and by counting the number of LREs they produced and correctly resolved (e.g., Dao & McDonough, 2017; Fernández-Dobao, 2012; Kim & McDonough, 2011).

In contrast, this study examined the quality of language learning by seven pairs of Japanese language learners during a long-term collaborative learning project using a new analytical approach. Specifically, it compared the quality of the LREs discussed by focusing on the communication functions the LREs served in the collaborative dialogue. The findings showed that LREs were initiated to fulfil multiple communication purposes when completing a long-term collaborative learning project, including to solve language problems and to engage

in language learning with peers. As seen in Table 6.10, this study found that eight functions of LREs were discussed by the seven pairs. Comparing the LREs initiated for different communication functions per 'level of engagement' allowed this study to demonstrate how LREs initiated for different communication purposes provided language learners with different types of learning opportunities depending on their 'level of engagement' in discussing LREs (Storch, 2008). Table 6.10 summarises the characteristics of the responses triggered by each LRE function per 'level of engagement':

Table 6.10: Comparison of LRE functions per level of engagement

	LREs with 'limited engagement'	**LREs with 'elaborate engagement'**
1. Confirming a Japanese word or expression	A peer replied with a brief response showing agreement or providing a correct expression.	A peer responded to a question by providing alternative expressions and clarifying semantic meaning.
2. Requesting provision of a Japanese word or expression	A peer responded to the request by providing a Japanese word and an expression without deliberating the meaning.	A peer responded to the request by providing alternative expressions and deliberating the usage and meaning.
3. Requesting explanation of a Japanese word or expression	A peer responded to the request to explain a Japanese word or expression by providing a one-word or one-phrase translation.	A peer responded to the request by deliberating the sematic meaning of a Japanese word or expression in-depth.
4. Correcting a peer's word or expression	A peer instructed how to correct a Japanese word or expression without explaining the reason for the correction.	A peer not only provided a correction, but also deliberated the reasons for the correction and provided a sample sentence.
5. Confirming pronunciation of a Japanese word	A peer responded to the question by pronouncing a Japanese word. The peer then wrote down or typed the pronunciation.	Not observed in this data.

As seen in Table 6.10, LREs initiated for different communication functions elicited different types of linguistic information from peers. For example, the participants provided Japanese equivalent words when their peers initiated LREs for 'requesting provision of a Japanese word or expression'. They pronounced Japanese words when their peers requested them to do so. In other words, the participants initiated LREs with different functions to obtain different types of linguistic information they needed to resolve the language problems they encountering during the project. What is worthwhile to note here is that some pairs such as Pair 4-6 initiated more LRE functions which were more likely to trigger LREs with 'elaborate engagement', which Storch (2008) considers more conductive for language learning.

By comparing the quality of LREs initiated for different functions per 'level of engagement' (Storch, 2008), this study also found that the LREs initiated for the same function provided different levels of linguistic information. As such, the extent to which they may contribute to language learning can depend on the participants' 'level of engagement' in discussing LREs (Storch, 2008). For example, regardless of the LRE functions provided in Table 6.6, LREs with 'limited engagement' accompanied a brief response to peers without deliberating the meaning or usage of the Japanese words or expressions. The peers also did not explain the reasons for their correction. In other words, although brief LREs with 'limited engagement' allowed the participants to resolve their linguistic problems in order to complete their on-going tasks, they may not help them to understand in depth the lexical meaning or the usage so that they can resolve similar language problems in other contexts. On the other hand, LREs with 'elaborate engagement' accompanied elaborate linguistic explanations, alternative expressions, and/or sample sentences. Hence, LREs with 'elaborate engagement' provided the participants with in-depth linguistic explanations which may help them to complete their on-going tasks by deeply understanding the lexical meaning and usage of the Japanese expressions and the reasons for the correction.

Thus, analysis of LRE functions per 'level of engagement' revealed differences in the quality of language learning by the seven participant pairs while engaging in collaborative dialogue with peers. This is because the different levels of engagement triggered responses of different quality from peers which could be used for language learning.

6.6 Conclusion

To examine the quality of language learning engaged in by the seven participant pairs during this long-term collaborative learning project, this section compared the quality of the LREs the pairs discussed by focusing on the following four aspects: 1) 'level of engagement' in discussing LREs (Storch, 2008); 2) the number of LREs correctly resolved, incorrectly resolved or left unresolved (Lesser, 2004; Swain, 1998); 3) the reasons for the unresolved LREs; and 4) the communication functions each LRE served in the collaborative dialogue.

The findings highlighted the different quality of language learning by the seven pairs as a result of having engaged in collaborative dialogue with peers during this project. Some pairs engaged in effective language learning during collaborative dialogue with peers; whereas other pairs did not. As discussed in Section 6.2.1, Pairs 5 and 6 produced a greater number of LREs with 'elaborate engagement' which Storch (2008) has asserted is more effective for language learning. They resolved more LREs than the other five pairs (Section 6.3.1). In addition, Pairs 5 and 6 initiated LRE functions more likely to trigger LREs with 'elaborate engagement' (Section 6.4.2).

These findings raise important pedagogical questions. Did Pairs 1-4, 7 still learn Japanese during this project? If so, how did they engage in language learning despite the ineffective processes? Were peers the only resources used by the participant pairs to engage in language learning? Was collaborative dialogue with peers the only occasion when the pairs engaged in language learning during this project? The answer to each of these questions is 'No'. The

findings showed that the participants' linguistic knowledge was just one element in the repertoire they used to resolve language problems and to engage in language learning during this project. Discussing LREs with peers was just one of the contexts used by the pair participants to engage in Japanese language learning while working on their long-term collaborative learning project. Hence, the pairs constructed opportunities to learn Japanese while having collaborative dialogue with peers as well as in other learning contexts.

Whereas this chapter focused on the pair participants' language learning in collaborative dialogue with peers by sharing their linguistic knowledge, the next chapter examines their language learning from broader perspectives; namely: language learning using alternative resources in collaborative dialogue; and language learning outside collaborative dialogue with peers.

Chapter 7

Language learning using alternative learning resources in collaborative digital storytelling projects

7.1 Introduction

Chapter 6 explored the language learning undertaken by the seven participant pairs in this study by focusing on the contexts in which they constructed knowledge of Japanese by sharing linguistic resources in collaborative dialogue with peers. The findings reported in Chapter 6 revealed that the quality of language learning differed among the seven pairs due to differences in the collaborative dialogue with peers during this project. Some pairs demonstrated more effective engagement in language learning than other pairs by discussing more Language-Related Episodes (LREs) with 'elaborate engagement' and by resolving more LREs. However, the findings did not indicate that the pairs which did not discuss LREs with 'elaborate engagement' then did not engage in language learning during this project. They indeed engaged in Japanese language learning in alternative learning contexts including: 1) learning Japanese in collaborative dialogue using alternative learning resources; 2) engaging in individual language learning during the research study sessions; and 3) constructing opportunities for language learning outside the sessions using alternative learning resources. In other words, collaborative dialogue with peers to share linguistic knowledge is just one of the contexts the participants engaged in to learn Japanese during this project. Hence, the participant pairs constructed opportunities for language learning in alternative learning contexts by interacting with multiple resources.

Although Chapter 6 examined language learning by focusing on participants in the context of LREs, Chapter 7 explores their language learning in alternative learning contexts by focusing on their resource use. In turn, four aspects of the participant pairs' resource use during

this project were examined, drawing on the following concepts of 'material resources' and 'social resources' proposed by Palfreyman (2006, 2014): 1) types of resources used for language learning; 2) how the resources are used to engage in language learning; 3) the role of the resources in language learning; and 4) learner perceptions of resource use for language learning. In Section 7.1.1, the analytical procedures to examine the participants' language learning both inside and outside collaborative dialogue using alternative resources are explained in depth. Section 7.2 examines the types of resources the participants used to resolve their language problems in collaborative dialogue with peers. Section 7.3 demonstrates how use of online resources may enhance language learning in collaborative dialogue, particularly LREs with 'limited engagement' in which learners do not deliberate the meaning or usage of new Japanese words or expressions (Storch, 2008). Section 7. 4 then shifts the focus of the examination to the participants' resource use for language learning outside collaborative dialogue with peers. This chapter concludes with a recommendation to language educators to encourage learners to creatively and strategically use resources relevant to their learning objects and preferred learning styles to enhance language learning during long-term collaborative learning projects.

7.1.1 Analytical procedures

The aim of Chapter 7 is to answer Research Question 3; do the participants use alternative resources other than their own linguistic knowledge? If so, what other resources do they use to enhance their learning. To answer the question, this chapter examines what types of alternative resources other than their own linguistic knowledge the participants used to engage in language learning during this project both inside and outside collaborative dialogue with peers. The following sections outline each of the analytical procedures.

7.1.1.1 Analysing language learning in collaborative dialogue with alternative resources

Language learning inside collaborative dialogue using alternative learning resources is the first learning context to be examined. To analyse the participant pairs' language learning in this context, the following four analytical procedures were implemented; 1) identifying the types of resources used; 2) examining the distribution of each resource type; 3) analysing the distribution of resource types per pair; and 4) calculating the probability of the resource types triggering either LREs with 'elaborate engagement' or LREs with 'limited engagement'.

1) Identifying the types of resources

The first coding procedures were conducted to identify the types of resources used by each pair of learners to resolve language problems during collaborative dialogue with peers. First, coding categories were developed to distinguish the types of resources they used by carefully reading the segments coded as 'LREs' and by watching the relevant video segments. Based on the analysis of pilot data, the following two higher-coding categories were developed to distinguish the participants' resource use:

1) **Non-online resources**: resources which do not require learners to have access to or use the Internet

2) **Online resources**: resources which do require learners to have access to and use the Internet

The 'non-online resources' category was further classified into the following four coding subcategories: 1) linguistic knowledge of one participant; 2) linguistic knowledge of both participants; 3) linguistic knowledge of the researcher; and 4) linguistic knowledge of both the researcher and peers. Table 7. 1 shows a sample excerpt for each 'non-online resources' sub-coding category used by the participants in collaborative dialogue:

Table 7.1: Subcategories for non-online resources used in collaborative dialogue

Coding categories	A sample excerpt for each coding category
1. Linguistic knowledge of one participant	1. Walter: ((Walter is asking why Jiyoung suggested to use 'Aから Bまで'(From A to B))) But 'なぜ 'AからBまで'(But why (we use an expression 'from A to B')? 2. Jiyoung: 'From (A) to (B)". In that way, we can express first, then. we can list from that time.
2. Linguistic knowledge of both participants	1. Jiyoung: ((Jiyoung is suggesting to use '家族向け'(family oriented) in their sentences instead of '家族的'(family oriented). She is explaining the expression is a direct Korean translation of '가족적'(family-oriented)) I think it is Korean expression. Focused on family. 2. Walter: ((Walter is explaining the usage of '家族向け'(family oriented) to Jiyoung)) ' (家族)向け'((family) oriented) is faced like 3. Jiyoung: '家族向けのレジャーが楽しめます。'((We) can enjoy family oriented leisure activities (in Sydney). Relaxation is really family oriented.
3. Linguistic knowledge of the researcher	1. Yuki: How do you say 'top of mountain'? 2. Researcher: '山の頂上'(Top of the mountain) 3. Yuki: '頂上。山の頂上。'(Top. Top of the mountain).
4. Linguistic knowledge of both the researcher and peers	1. Yuki: How do you say floating gently down? 2. Lucie: 'やさしく'(Gently). 3. Yuki: 'やさしく'(Gently) floating 4. Researcher: '桜の花がゆっくり舞い落ちた。'(Paddles of Cherry Blossom gentry flew down). Like dancing and falling off.

To analyse the participant pairs' use of 'online resources' in collaborative dialogue, the following eight coding subcategories were developed based on how the participants used the online resources in this learning context:

1) Both participants searched online resources;

2) Participants typed the correct answers;

3) Participants searched online resources following a question from a peer;

4) Participants searched online resources following peer explanation;

5) Participants asked a peer following a search of online resources;

6) Participants searched online resources rather than ask a peer;

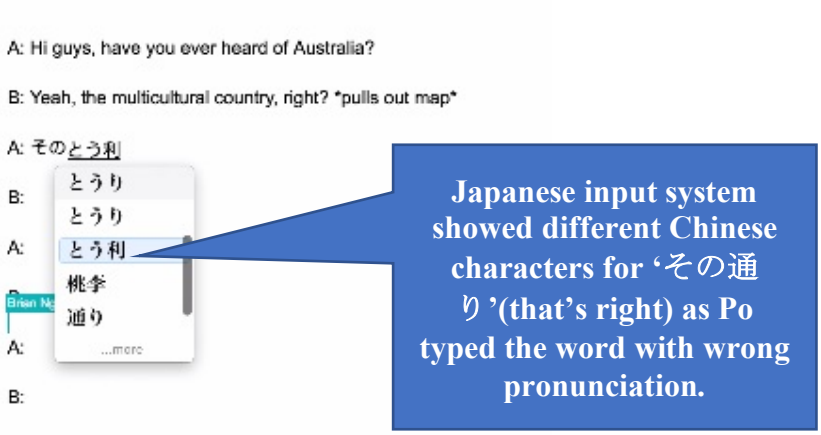
7) Participants asked a researcher following a search of online resources; and

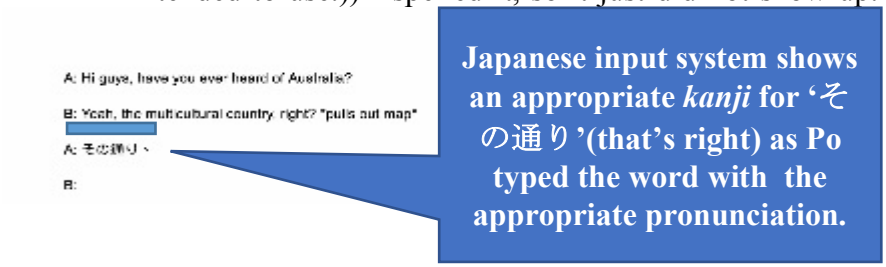
8) Participants searched online resources following researcher explanation.

Table 7.2 provides a sample excerpt per coding subcategory for 'online resources' used by participants in collaborative dialogue as well as a sample excerpt for each coding category.

Table 7.2: Subcategories for online resources used in collaborative dialogue

Coding categories	**A sample excerpt for each coding category**
1. Both participants searched online resources;	Only one excerpt was observed. See Excerpt 4 in 7.3.4
2. Participants typed the correct answers	1. Brian: I forgot a word for 'drunk' 2. Po: '酔っぱらう(Get drunk)'. '酔い'(Verb stem form for '酔う'(get drunk)). 3. Brian: '酔い?' (Drunk?) '酔う'(Get drunk). Umm ok. Watching drunken person dance around ((Brian is explaining how he wants to use the word in sentences to Po)) 4. Po: ((Po typed '酔っぱらう'(get drunk) for Brian via Google Docs)). 5. Brian: ((Brian confirmed what Po has typed for him)) Yeah, that works.

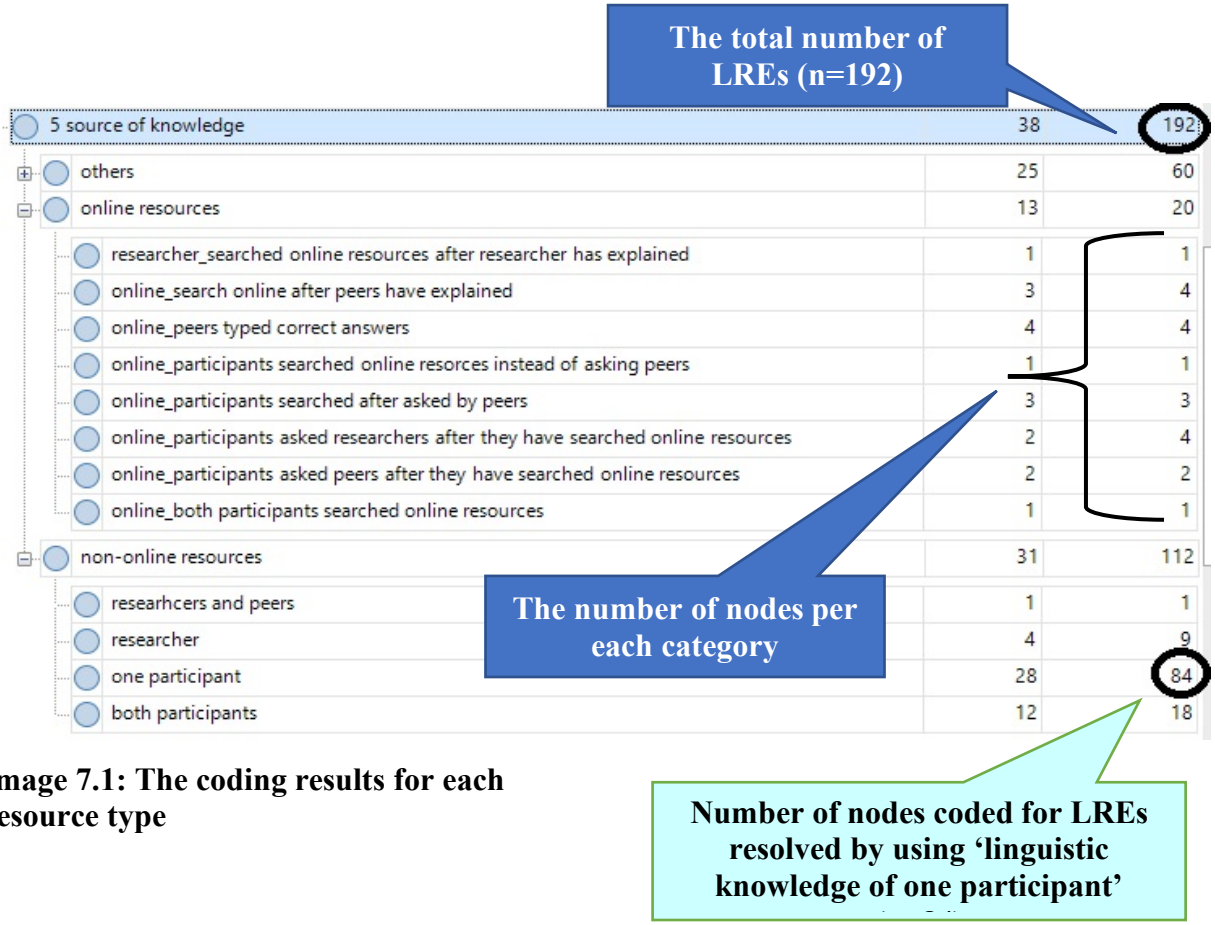
3. Participants searched online resources following a question from a peer	1. Walter: I really want to use 'diverse'. 'Diverse culture'. 2. Jiyoung: ((Jiyoung searched online dictionary for Walter)) '多様'(Diverse). 3. Walter: '多様'(Diverse).
4. Participants searched online resources following peer explanation	1. Brian: (Japanese friend's name) was in quire 2. Po: Quire? 3. Brian: 'コーラス'(Quire). 4. Po: 'コーラス'(Quire). ((Po searched 'quire' using Internet after Brian explained the meaning in English))
5. Participants asked a peer following a search of online resources	1. Stephanie: ((Stephanie is reading an English sentence she is rewriting into Japanese)) Learning Japanese become more popular. There are many way to say 'becoming popular'. It is also interesting that there are so many way to say blossom. Which is most appropriate? ((Showing searching results in an online dictionary to Sherry)) Which one do you want (me) to use (in our script)? 2. Sherry: ((Pointing '盛んになる'(become blossom)))
6. Participants searched online resources rather than ask a peer	1. Po: ((Po was trying to type 'その通り (*sono tōri*)'(that's right)' using Google Docs. To indicate the Japanese word, Po should have typed it as 'sono toori'. However, he inappropriately typed the word as 'sono touri'. Therefore, Japanese input system indicated different *kanji* for 'その通り (*sono tōri*)'(that's right)'.)) Umm?? I cannot spell 'その通り'(that's right).  2. Brian: ((Looking at Po's erroneous *kanji* via Google Docs and laughing)) <hhh>

	3. Po: ((Po retyped the word with the correct pronunciation, Japanese input system showed a *kanji* word Po had intended to use.)) I spelled it, so it just did not show up. 
7. Participants asked a researcher following a search of online resources	1. Lucie: Is that ok? '目の覚めるような赤い葉'(Vivid red leaves (as if they wake us up with the vividness). 2. Researcher: いい表現ですね。目の覚めるような赤い葉。 That's a good expression. Vivid red leaves (as if they wake us up with the vividness). 3. Lucie: ((Lucie explained to the researcher how she constructed the expression)) '辞書で'((I found the expression) in a dictionary).
8. Participants searched online resources following researcher explanation	1. Po: ((Po is looking at the researcher and asking how to say 'culture shock' in Japanese)) 'カルチャーショック、これ日本語で。文化の衝撃とか？' (Culture shock. (How do you say) this in Japanese? (Do you say) like '文化の衝撃'(shock of culture)? 2. Researcher: 'カルチャーショックを受けましたか？'(Have (you) experienced culture shock?) 3. Po: 'ああ。カルチャー'(Ah, culture) 4. Brian: 'カルチャー'(Culture) 5. Po: 'ショックそのまま？'(Just say 'shock' (in Japanese) as it is?) 6. Brian: ((Brian is making a joke)) 'そんなショック' (That's shocking). 7: Po: ((Po is writing a meme while laughing. He then searched how to write 'culture shock' in Japanese by searching Internet).

In addition, transcriptions of the video-recordings taken while the participants were creating digital stories in the research study sessions were coded using the aforementioned 11 coding subcategories for 'non-online resources' and 'online resources'.

2) Examining the distribution of each resource type

The second procedure aimed to determine the extent to which each resource was used by the seven participant pairs in collaborative dialogue. The analysis begins by indicating the first coding results; the number of nodes per each resource type used in collaborative dialogue using Nvivo. Once completing the first coding procedure, Nvivo indicates the number of nodes per resource type the seven pairs used in collaborative dialogue as seen in Image 7.1.



5 source of knowledge	38	192
others	25	60
online resources	13	20
researcher_searched online resources after researcher has explained	1	1
online_search online after peers have explained	3	4
online_peers typed correct answers	4	4
online_participants searched online resorces instead of asking peers	1	1
online_participants searched after asked by peers	3	3
online_participants asked researchers after they have searched online resources	2	4
online_participants asked peers after they have searched online resources	2	2
online_both participants searched online resources	1	1
non-online resources	31	112
researhcers and peers	1	1
researcher	4	9
one participant	28	84
both participants	12	18

Image 7.1: The coding results for each resource type

Secondly, the percentage of each resource type used by the seven pairs was calculated using coding results emerged from the first coding procedure (see Image 7.1). To identify distribution of resources types used in collaborative dialogue, the number of nodes per resource type was divided by the total number of LREs discussed by the seven pairs (n=192). For example, Image 7.1 shows 84 LREs were resolved by using 'linguistic knowledge of one participant'. To calculate the percentage of LREs resolved by the resource type, the number of LREs resolved by 'linguistic knowledge of one learner' (n=84) was divided by the total number of LREs discussed by the seven pairs (n=192). The calculation showed 44% of LREs (n=84) were resolved using the 'linguistic knowledge of one participant'. The same calculation procedure was repeated for each 'resource type' coding category.

3) Analysing the distribution of resource types per pair

The third procedure aimed to identify the distribution of resources used by each pair in collaborative dialogue. For this calculation, the number of nodes coded by resource types used by each pair was first determined using the 'matrix coding' function in Nvivo (Image 7.2). 'Matrix coding' function allows the users to generate a customised Table indicating the number of nodes per selected coding category per selected case [participants]. To identify distribution of resource types used by each pair in collaborative dialogue, a Table showing coding results for resource types used by each pair in collaborative dialogue was generated. For example, 'matrix coding 'function generated a Table showing distribution of resource types used by Pair 6 (Jiyoung/Walter) as seen in Image 7.2.

Following this procedure, the percentage of each resource used by each pair was calculated by dividing the number of nodes per resource type the pair used by the total of LREs the pair initiated. For example, Image 7.2 shows Pair 6 (Jiyoung/Walter) resolved 50 LREs by using 'linguistic knowledge of one participant'. To calculate the percentage of LREs resolved by Pair 6 (Jiyoung/Walter) using the 'linguistic knowledge of one participant', the number of nodes coded with 'knowledge of one participant' (n=50) was divided by the total number of LREs the pair initiated (n=93). The calculation showed Pair 6 resolved 54% of their LREs using the 'linguistic knowledge of one participant'.

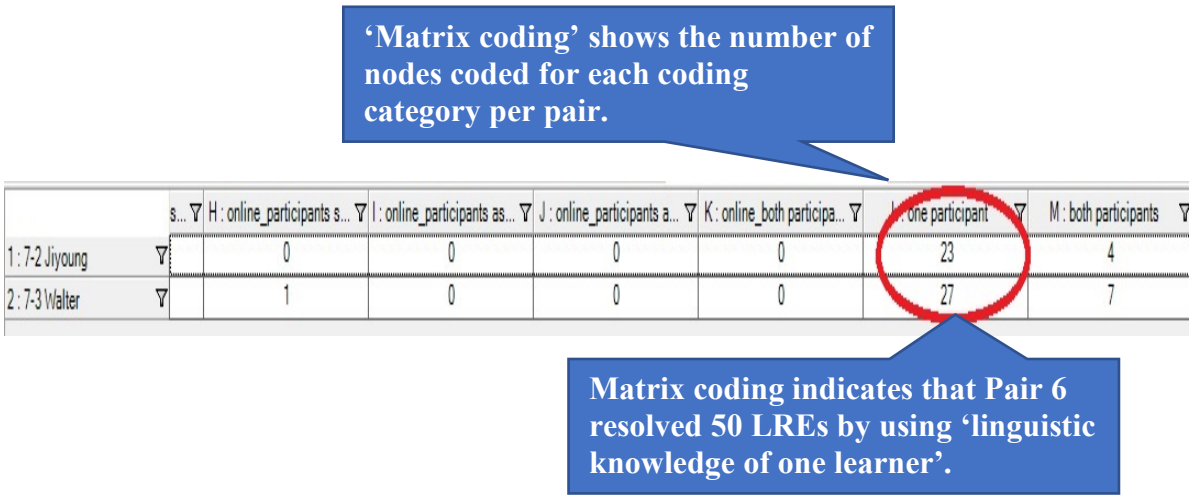


Image 7.2: A part of the coding results per resources type use by Pair 6

4) Calculating the probability of the resource types triggering either LREs with 'elaborate engagement' or LREs with 'limited engagement'

The next procedure was to calculate the probability of the resource type triggering either LREs with 'elaborate engagement' or LREs with 'limited engagement'. The analytical procedure starts by generating a Table showing the number of nodes coded for 'level of engagement' and 'types of resources (either online or non-online resources) by using 'matrix coding' function' (See Image 7.3).

	A : limited engagement	B : elaborate engagement
1 : online resources	11	9
2 : non-online resources	50	62

Image 7.3: The coding results per 'level of engagement' and 'types of resources'

The next procedure is to calculate the probability triggering either LREs with 'limited engagement' or 'elaborate engagement' per resource type (either online or non-online resources). For this calculation, Tables showing the number of LREs per 'level of engagement' for 'online resources' (Table 7.3) and 'non-online resources' (Table 7.4) were initially developed based on the above coding results generated by 'matrix coding' (Image 7.3). Table 7.3 shows the number of nodes coded for LREs resolved using online resources per level of engagement, whereas Table 7.4 indicates the one of node coded for LREs resolved using non-online resources per level of engagement.

Table 7.3: A sample Table showing the number of LREs for 'online resources'

Types of LREs	**LREs with limited engagement**	**LREs with elaborate engagement**	**Total**
Online resources	11 (%)	9 (%)	20 (100%)

Table 7.4: A sample Table showing the number of LREs for 'non-online resources'

Types of LREs	**LREs with limited engagement**	**LREs with elaborate engagement**	**Total**
Non-online resources	50 (%)	62 (%)	112 (100%)

Once Tables as seen in Table 7.3 and 7.4 were generated, the probabilities for each resource triggering either LREs with 'elaborate engagement' or LREs with 'limited engagement' were calculated. To calculate the probability of each resource triggering either level of LREs, the number of nodes per resource type (online or non-online resources) per level of engagement (LREs with limited engagement or LREs with elaborate engagement) were divided by the total of LREs resolved per each resource type.

For example, the probability of online resources triggering LREs with 'limited engaging' was identified by dividing the number of LREs with 'limited engagement' resolved by online resources (n=11) by the total of LREs resolved using online resources (n=20). The results show that 55% of LREs using online resources triggered LREs with 'limited engagement'. The same calculation is repeated to identify the probability of each resource type triggering LREs with 'elaborate engagement' or LREs with 'limited engagement'.

7.1.1.2 Analysing language learning outside collaborative dialogue with peers

Although Section 7.1.1.1 illustrated analytical procedures for language learning undertaken in collaborative dialogue by using alternative resources, this section describes how the participants engaged in language learning outside collaborative dialogue with peers. This type of language learning was observed in two learning contexts: 1) engaging in language learning individually during the research study sessions; and 2) engaging in language learning outside the sessions. The pilot analysis of the data showed that language learning outside collaborative dialogue with peers involved interactions with resources such as Japanese native speakers and online resources. Based on the analysis, this study analysed language learning outside collaborative dialogue with peers by focusing on types of resources they used and types of language learning activities they engaged using the resources drawing on the concept of 'resources' (Palfreyman, 2006, 2014).

1) Engaging in language learning individually during the research study sessions

First of all, language learning outside collaborative dialogue with peers occurred when the participants took individual learning approaches during the research sessions. To analyse this type of individual learning, video-recordings of the sessions and the relevant semi-structured interviews were closely scrutinized to develop the following coding categories compromising the three coding levels presented in Table 7.5.

While the participants were engaging in individual learning during the sessions, only 'social resource' was not used. Therefore, this study analysed only their use of 'material resources' for individual learning during the sessions. In the first level, 'material resources' were coded wither as 'online resources' or 'non-online resources'. In the second level, the nodes were further classified into the subcategories of each resource type; including 'online dictionaries' and 'audio recordings'. Third coding procedure was conducted to identify purposes that the participants used the resource. The researcher then carefully read each segment coded with 'social resource' to understand how the participant perceive the strengths and limitations of using the resource for language learning.

Table 7.5: Coding categories for individual learning during the sessions

	Material resources				**Social resources**
Level 1	Online resources		Non-online resources		
Level 2	(e.g.) Online dictionaries	(omission)	(e.g.) Audio recordings	(omission)	
Level 3	(e.g.) 1) Check how the word is used in sentences 2) Search Japanese words 3) understand *kanji* words	(omission)	(e.g.) 1) Detect pronunciation errors 2) Remember new words	(omission)	

2) Engaging in language learning outside the research sessions

Language learning outside collaborative dialogue was also observed outside the research sessions the researcher organised for data collection. This type of language learning occurred outside the settings that the researcher could access to obtain the data. Therefore, this type of language learning was analysed using transcriptions of the semi-structured interviews which the participants have commented their resource use for language learning outside the sessions as well as mind-maps drawn by the participants during the interviews were also read closely (Appendix 8).

Table 7.6 illustrated coding procedures conducted to examine language learning undertaken by the participants outside the research sessions. First of all, segments of the semi-structured interviews which the participants described their resources use outside the session was coded with either 'material resources' or 'social resources' (First level). In second level, 'material resources' were classified either into 'online resources' or 'non-online resources'. In third procedure, the nodes were further classified in the subcategories of resource types such

as ‘websites’, ‘textbooks’ and Japanese friends on campus’. Fourth coding procedure was conducted to identify purposes of using the resource outside the sessions. Nodes coded for resource types used outside the sessions were carefully read to understand what strengths and constraints of using the resources for language learning were illustrated by the participants.

Table 7.6: Coding categories for resources used outside the research sessions

Level 1	**Material resources**				**Social resources**	
Level 2	Online resources		Non-online resources			
Level 3	(e.g.) Websites	(omission)	(e.g.) Textbooks	(omission)	(e.g.) Japanese friends on campus	(omission)
Level 4	(e.g.) 1) Check Japanese grammar 2) Learn topic related words	(omission)	(e.g.) 1) Japanese grammar 2) check *kanji* words	(omission)	(e.g.) 1. Learn appropriate expressions by receiving feedback 2. Learn Japanese’ perspectives	(omission)

7.2 Engaging in collaborative dialogue using alternative resources

Several previous studies have examined how language learners develop knowledge of their target language during short-term collaborative learning tasks by focusing on learner engagement in collaborative dialogue with peers using only their own linguistic resources (e.g., Fernández-Dobao, 2012; McDonough, 2004; Park, 2015). However, learners may creatively use alternative learning resources to resolve the language problems they address in collaborative dialogue. Indeed, under such learning conditions they may use any number of

resources they think will be useful for language learning during collaborative learning tasks/projects. Section 7.2.1, discusses the percentage amounts in which the seven pairs resolved their language problems using only their own linguistic knowledge. Section 7.2.2 details the distribution of resource types used by the participants to resolve their language problems in collaborative dialogue. Section 7.2.3 explores the impact of using online resources on 'level of engagement' when the participants are discussing their LREs (Storch, 2008).

7.2.1 Using individual linguistic resources or other alternative resources

To resolve language problems during collaborative dialogue, the seven participant pairs used their own linguistic resources to different extents. Table 7.7 provides an overview of the resources used by each pair to resolve their language problems during collaborative dialogue. As seen in the Table, 53% of LREs in total (n=102) were correctly resolved using the linguistic knowledge of either 'a learner' or 'both learners'. Alternatively, 16% of LREs (n=30) were resolved using other alternative resources. Lastly, 22% of LREs (n=42) were incorrectly resolved, whereas 9% of LREs (n=18) remained unresolved.

Of the seven participant pairs, Pair 1 (Tessie/Yujin) and Pair 6 (Jiyoung/Walter) resolved their LREs using their own linguistic resources to the greatest extent, at 69% (n=9) and 66% (n=61), respectively. In contrast, Pair 5 (Lucie/Yuki) and Pair 4 (Brian/Po) used other resources more frequently than the other participant pairs to resolve their language problems, at 54% (n=15) and 28% (n=7), respectively.

Table 7.7: Percentage of LREs resolved per resource

Patterns of peer interactions	Pairs	Correctly resolved LREs (n=132, 69%)		Others (n=60, 31%)		Total LREs discussed by the pair
		LREs solved using linguistic knowledge of 'a learner' or 'both learners'	LREs correctly resolved using other resources	Unresolved LREs	LREs incorrectly resolved	
1. Division of labour	**Pair 1 (Tessie/Yujin)**	9 (69%)	3 (23%)	1 (8%)	0 (0%)	13
	Pair 2 (Kasumi/Sky)	7 (32%)	1 (5%)	0 (0%)	14 (64%)	22
	Pair 3 (Sherry/Stephanie)	4 (57%)	1 (14%)	1 (14%)	1 (14%)	7
	Pair 4 (Brian/Po)	11 (44%)	7 (28%)	6 (24%)	1 (4%)	25
2. Collaborative storytelling	**Pair 5 (Lucie/Yuki)[42]**	10 (36%)	15 (54%)	3 (11%)	0 (0%)	28
3. Collaborative knowledge construction	**Pair 6 (Jiyoung/Walter)**	61 (66%)	2 (2%)	5 (5%)	25 (27%)	93
4. Limited spoken interactions	**Pair 7 (Rena/Rita)**	0 (0%)	1 (25%)	2 (50%)	1 (25%)	4
	Total	102 (53%)	30 (16%)	18 (9%)	42 (22%)	192 (100%)

[42] I collected data from Pair 5 in a different context. This was due to Yuki's objective to participate in this project to improve her Japanese language by asking about Japanese expressions with Japanese native speakers. In addition, I collected data from four pairs which did not involve the researcher at that time. Therefore, I did not reject requests to answer the participants' Japanese questions. Therefore, 17 out of 28 LREs were addressed to the researcher. Three of the LREs addressed to the researcher remained unresolved.

7.2.2 Using multiple resources in collaborative dialogue

As discussed in Section 7.2.1, 53% of LREs (n=102) were resolved by pooling the pairs' linguistic resources; whereas 16% of LREs (n=30) were resolved using alternative resources. LRE segments (n=192) were further re-coded to better understand the types of resources used by each pair and how the resource was used to resolve language problems in collaborative dialogue. Based on my pilot data analysis, the following coding categories for non-online resources were developed including the linguistic knowledge of: 1) one learner; 2) both learners; 3) a researcher; and 4) both a researcher and a peer.

To identify distribution of online resources used by the participants for language learning, LREs resolved using online resources were coded by using the following eight coding categories: 1) both participants searched online resources; 2) participants typed the correct answers; 3) participant searched online resources following a question from a peer; 4) participant searched online resources following peer explanation; 5) participant asked a peer following a search of online resources; 6) participant searched online resources rather than ask a peer; 7) participants asked a researcher following a search of online resources; and 8) participants searched online resources following researcher explanation.

Table 7.8 provides an overview of the distribution of resources used by the seven participant pairs and how they used the resources to resolve their language problems. It shows 58% of LREs (n=112) were resolved using non-online resources; whereas 10% of LREs (n=20) were resolved using online resources.

Table 7.8: Types of resources used to resolve language problems (Part 1)

Types of resources	Non-online resources 112 (58%)				Online resources 20 (10%)			
	One participant	Both participants	A researcher	Both a researcher and a peer	Both participants searched online resources	Participants typed the correct answers	Participants searched online resources following a question from a peer	Participants searched online resources following peers explanation
Pair 1 (Tessie/ Yujin)	9 (69%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	2 (15%)	0 (0%)	0 (0%)
Pair 2 (Kasumi/ Sky)	7 (32%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (5%)	0 (0%)
Pair 3 (Sherry/ Stephanie)	3 (43%)	1 (14%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Pair 4 (Brian/Po)	9 (36%)	2 (8%)	0 (0%)	0 (0%)	0 (0%)	2 (8%)	1 (4%)	2 (8%)
Pair 5 (Lucie/ Yuki)	6 (21%)	4 (14%)	9 (32%)	1 (4%)	0 (0%)	0 (0%)	0 (0%)	1 (4%)
Pair 6 (Jiyoung/ Walter)	50 (54%)	11 (12%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (1%)	1 (1%)
Pair 7 (Rena/Rita)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (25%)	0 (0%)	0 (0%)	0 (0%)
Total	84 (44%)	18 (9%)	9 (5%)	1 (0.5%)	1 (0.5%)	4 (2%)	3 (2%)	4 (2%)

Table 7.8: Types of resources used to resolve language problems (Part 2)

Types of resources	Online resources				Others 60 (31%)		LREs in total
	Participants asked a peer following a search of online resources	Participants searched online resources rather than ask a peer	Participants asked a researcher following a search of online resources	Participants searched online resources following researcher explanation	Unresolved	LREs incorrectly resolved	
Pair 1 (Tessie/Yujin)	1 (8%)	0 (0%)	0 (0%)	0 (0%)	1 (8%)	0 (0%)	13 (100%)
Pair 2 (Kasumi/Sky)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	14 (64%)	22 (100%)
Pair 3 (Sherry/Stephanie)	1 (14%)	(0%)	0 (0%)	0 (0%)	1 (14%)	1 (14%)	7 (100%)
Pair 4 (Brian/Po)	0 (0%)	1 (4%)	0 (0%)	1 (4%)	6 (24%)	1 (4%)	25 (100%)
Pair 5 (Lucie/Yuki)	0 (0%)	0 (0%)	4 (14%)	0 (0%)	3 (11%)	0 (0%)	28 (100%)
Pair 6 (Jiyoung/Walter)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	5 (5%)	25 (27%)	93 (100%)
Pair 7 (Rena/Rita)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	2 (50%)	1 (25%)	4 (100%)
Total	2 (1%)	1 (0.5%)	4 (2%)	1 (0.5%)	18 (9%)	42 (22%)	192 (100%)

The most common resources used by the seven participant pairs to resolve their language problems were either linguistic knowledge of 'one participant' (44%, n=84) or 'both participants' (9%, n=18). Using the linguistic knowledge of 'a researcher' was third most frequently used resource (5%, n=9). This type of resource was used only by Pair 5 (Lucie/Yuki) as the other pairs were asked to resolve their language problems using resources other than 'a researcher'. Despite the small number, 2% of LREs were also resolved by 1) letting 'peers type correct answers' (n=4), 2) 'participant searched online resources following peer explanation' (n=4), 3) 'participants asked a researcher following a search of online resources' (n=4), and 4) 'participant searched online resources following a question from a peer' (n=3). The third method was also used only by Pair 5 (Lucie/Yuki) due to the aforementioned different research context.

7.2.3 Impact of using online resources on level of engagement

As discussed in Section 7.2.2, 10% of LREs (n=20) were resolved using online resources. To explore the impact of using online resources on 'level of engagement' (Storch, 2008), the LREs resolved using non-online resources (n=112) were compared to the online resources (n=20) per 'level of engagement'. Table 7.9 shows the distribution of LREs resolved using non-online resources (n=112) per 'level of engagement'; whereas Table 7.10 presents the distribution of LREs resolved using online resources (n=20) per 'level of engagement'. To calculate the probability that the resource use would trigger either level of LRE, the number for each resource per level was divided by the total number of LREs per resource type.

Table 7.9: Number of LREs resolved using non-online resources

Types of LREs	LREs with 'elaborate engagement'	LREs with 'limited engagement'	Total
Number of LREs	62 (55%)	50 (45%)	112 (100%)

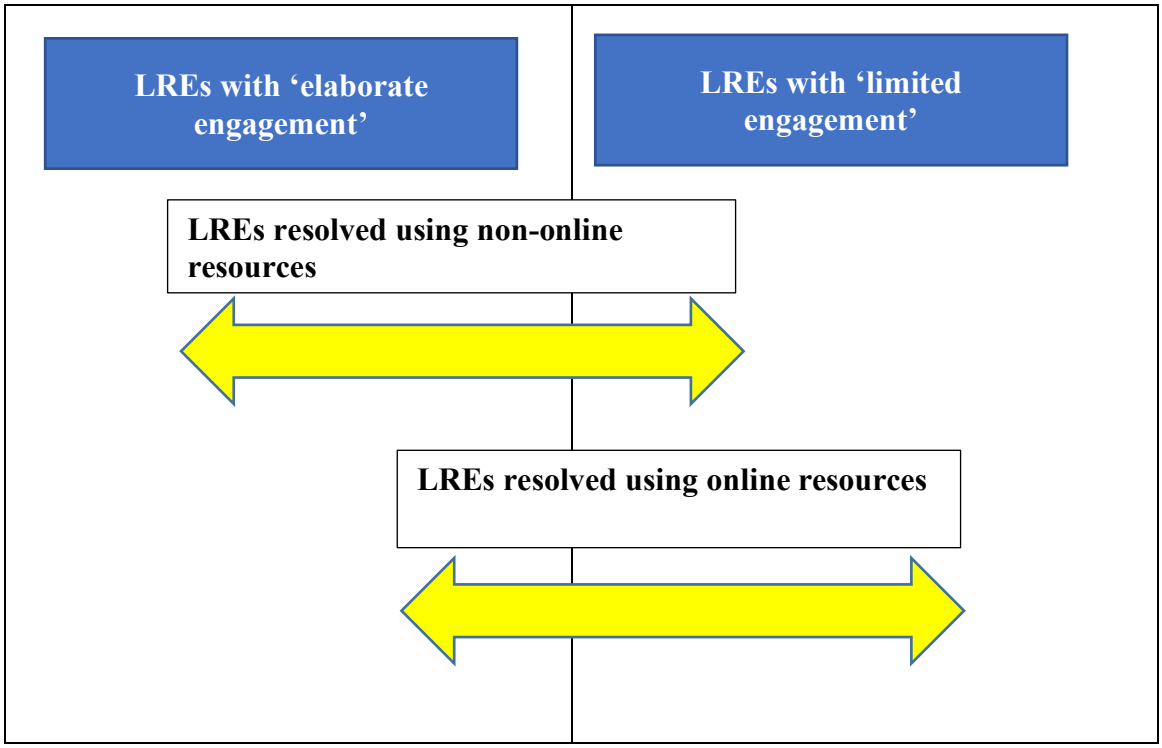
Table 7.10: Number of LREs resolved using online resources

Types of LREs	LREs with 'elaborate engagement'	LREs with 'limited engagement'	Total
Number of LREs	9 (45%)	11 (55%)	20 (100%)

Due to the small data set in this study (192 LREs in total including 60 resolved LREs), the results presented in Tables 7.9 and Table 7.10 had to be interpreted carefully. However, the results suggested that the LREs resolved using online resources triggered LREs with 'limited engagement' at a slightly higher rate (55%, n=11) than non-online resources triggered LREs with 'limited engagement' (45%, n=50).

Based on this result, Figure 7.1 was developed to visualise the impact of the resource type on triggering either LREs with 'elaborate engagement' or with 'limited engagement'. LREs resolved using non-online resources are shown on the left as they triggered LREs with 'elaborate engagement' at a slightly higher percentage. LREs resolved using online resources are shown in right as they developed slightly more LREs with 'limited engagement'.

Figure 7.1: Impact of resource use on types of LREs



Thus, using online resources in collaborative dialogue helped participants to resolve their language problems discussed in collaborative dialogue. However, resolving LREs using online resources resulted in them developing LREs with 'limited engagement' at a slightly higher rate, which Storch (2008) has asserted to be less conducive for language learning. The finding raised an important pedagogical question. How did the seven pairs engage in Japanese language learning by discussing LREs with 'limited engagement' using online resources? The answer to this question is discussed in Sections 7.3.

7.3 Enhancing language learning using online resources

As discussed in Section 7.2.3, LREs resolved using online resources developed slightly more LREs with 'limited engagement' which Storch (2008) has asserted to be less effective for language learning. However, this study found using online resources in collaborative dialogue enhanced the participant pairs' language learning while discussing LREs with 'limited engagement'. The follow sub-sections present five excerpts to frame a discussion of the role of online resources in enhancing language learning in LREs in 'limited engagement'.

7.3.1 Solving language problems by typing correct answers

'Providing correct answers to peers by typing' was used by the more proficient participant in Pair 1 (Yujin) and Pair 4 (Po) to resolve the language problems experienced by their less proficient peer. Regarding Pair 1 (Tessie/Yujin), Yujin typed the correct Chinese characters using Tessie's laptop because each participant had typed a different part of their script in Word in their own laptop (Image 7.4). Because Pair 4 (Brian /Po) were composing different lines of their script via Google Docs, Po corrected Brian's Japanese errors using affordances of Google Docs; 1) the real-time monitoring function; and 2) the function which allows multiple users to edit the same document synchronously or asynchronously. Excerpt 1 is an example of LREs with 'limited engagement' resolved by a more proficient peer (Po) typing the correct answers.

Image 7.4: Yujin (left) typed a Japanese word for Tessie (right)

While writing different lines using Google Docs, Po took on the role of proof reader of the sentences written by Brian due to his stronger writing proficiency. Image 7.5 shows a screenshot of the sentences written by Brian as discussed in Excerpt 1. Po initiated the discussion in Turn 1 in Excerpt 1 to seek confirmation of what Brian meant by 'ビデオで従業(員)'(an employee by video) in Sentence 2 (Image 7.5). In the sentence, Brian attempted to write, 'our university has video lectures, so we can study (by watching the video) at our dormitory'. However, Brian used inappropriate Chinese characters, '従業(員) (*jyūgyō(in)*)'(an employee) for '授業'(lecture) due to being confused by the similar sound of both Chinese-origin words and the similar combination of the Chinese characters.

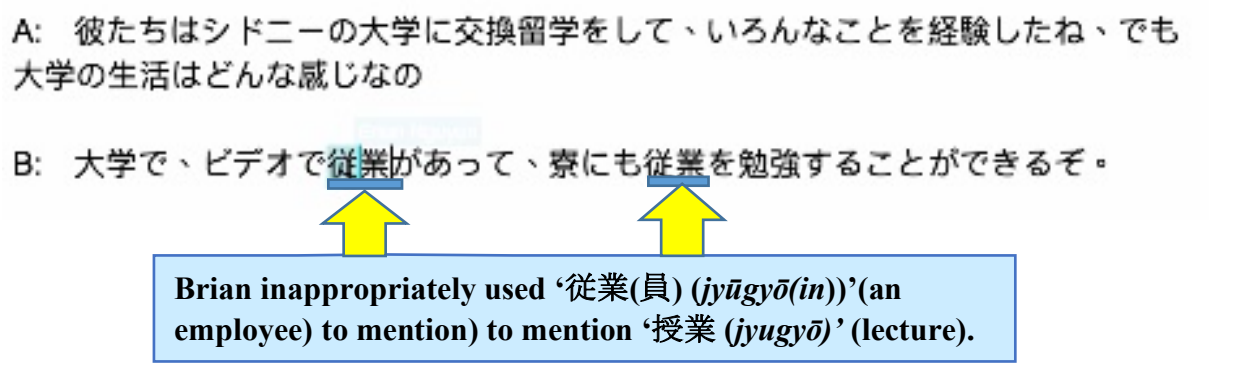


Image 7.5: Screenshot of sentences written by Brian using Google Docs

Researcher's direct translation of the above sentence

1. A: They had various experiences by participating in (a student) exchange program with a university in Sydney, didn't they? But how is their university life?
2: B: (Our) university has video **'従業(員)'(an employee),** so (we) can study (by watching **'従業(員)'(an employee)** at our dormitory.

Brian inappropriately used '従業(員) (*jyūgyō(in)*)'(an employee) to mention) to mention '授業 (*jyugyō)'* (lecture).

Po initiated Turn 1 to seek confirmation from Brian on what he meant by '従業(員) (*jyūgyō(in)*)'(an employee) written in Sentence 2 (see Image 7.5). However, because Po did not know how to pronounce '従業(員) (*jyūgyō(in)*)'(an employee) correctly, in Turn 1 he initiated the discussion by inappropriately pronouncing '従業(員) (*jyūgyō(in)*)'(an employee) as '*sōgyō*'.

Excerpt 1

1. Po: What is 'ビデオで'(with video) *sōgyō*?'[43] 'ビデオで'(with video) *sōgyō*.
   What's this?
2. Brian: *Sōgyō*? I wrote '授業 (*jyugyō*)'(lecture). Did I write wrong one?
3. Po: ((Po corrected Brian's erroneous Chinese characters as '授業 (*jyugyō*)'(lecture) via Google Docs))
4. Brian: Oh, '馬鹿 I did'(I did a silly mistake). I always screw up '授業 (*jyugyō*)'(lecture).
   Oh. '馬鹿'(stupid) Oh, *sōgyō*?
5. Po: *'Sōgyō*?'? I don't know how to pronounce '*sōgyō*'. ((Po realised he did not know how to pronounce '従業(員) (*jyūgyō(in)*)'(an employee) which Brian mistakenly written for '授業 (*jyugyō*)'(lecture). To find out how to pronounce the word, Po first typed '*sōgyō*. Japanese input application showed options of Chinese characters pronouncing S*ōgyō*.))

[43] There are several words pronouncing '*sōgyō*' using different Chinese characters. For example, if 'ビデオで *sōgyō*?' is written as 'ビデオで創業', it means 'start business using video'. If the learner writes 'ビデオで *sōgyō*?' as'ビデオで操業', it means 'operate using video'.
The meaning of 創業 can be confirmed at http://jisho.org/search/%E5%89%B5%E6%A5%AD
The meaning of 操業 can be confirmed at http://jisho.org/search/%E6%93%8D%E6%A5%AD

6. Brian: I always write the one previous.

7. Po: ((Po typed '従業(員) (*jyūgyō(in)*)'(an employee) to check the pronunciation of the characters. The input application showed '従業員 (*jyūgyōin)'*(employee) as one of the Chinese characters pronounced as'*jyūgyō'*.))

Po's question in Turn 1, **'**ビデオで'(with video) s*ōgyo*. What's this', made Brian realise that he had written '授業 (*jyugyō*)'(lecture) using inappropriate Chinese characters. Therefore, Brian explained to Po in Turn 2 that he had mistakenly written '従業(員)'(an employee) for '授業 (*jyugyō*)'(lecture). When Po understood that Brian was trying to describe '授業 (*jyugyō*)' (lecture), he corrected '従業(員)'(an employee) as '授業 (*jyugyō*)'(lecture) via Google Docs (Image 7.6).

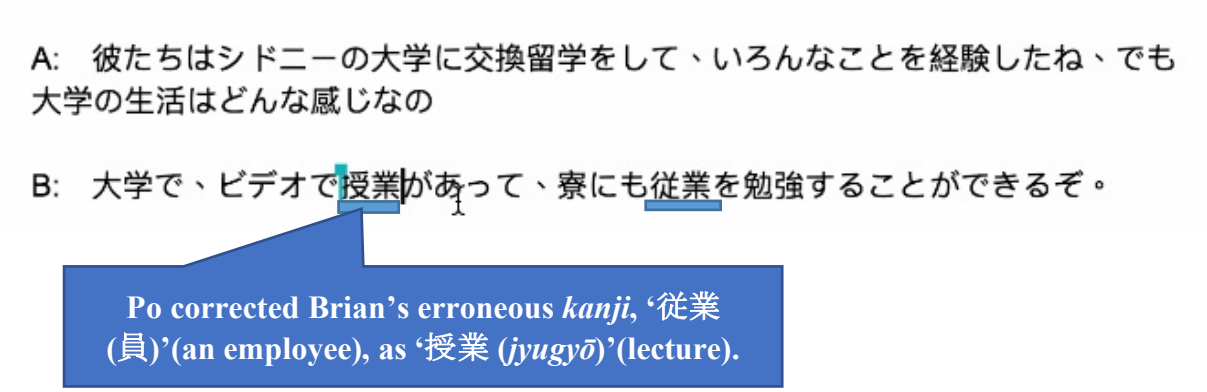


Image 7.6: A screenshot of a sentence corrected by Po using Google Docs

In Turn 1, Po inappropriately pronounced '従業(員) (*jyūgyō(in)'* (an employee)), which Brian had mistakenly written as '授業(*jyugyō*)'(lecture), as '*sōgyō*'. However, after listening to Brian's self-admonishment for his Japanese language errors in Turn 4, Po also realised in Turn 5 that he did not know how to pronounce '従業(員) (*jyūgyō(in)'* (an employee)). Therefore, Po tried to discover the pronunciation for '従業(員) (*jyūgyō(in)'* (an employee)) using a Japanese input system; to indicate several *kanji* words including pronunciation typed by the user. Po first typed '*sōgyō*' which he had mistakenly pronounced for '従業(員) (*jyūgyō(in)'*(an employee)) in Turn 1 (Image 7.7).

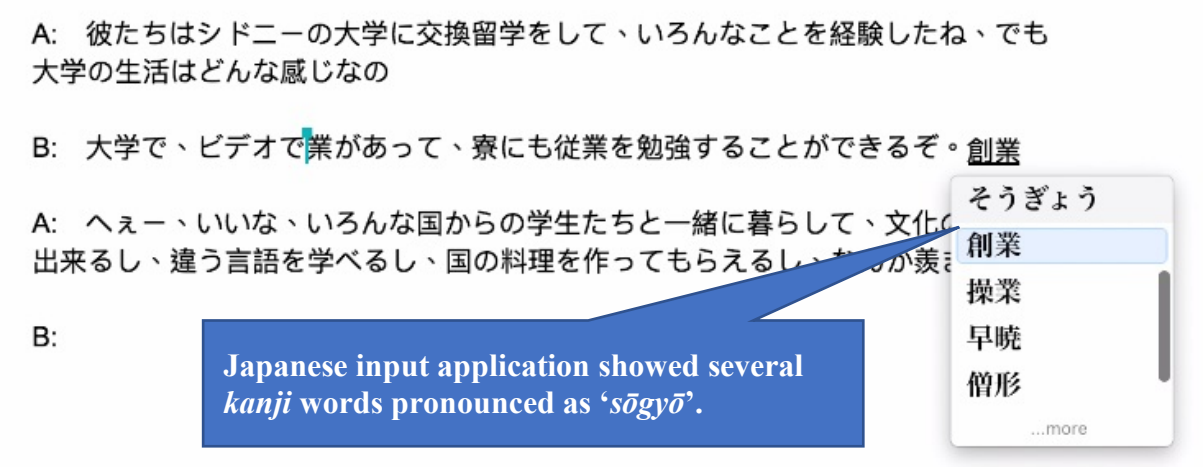


Image 7.7: Confirming Chinese characters pronounced as '*sōgyō*' using Japanese input application

After Po confirmed that the *kanji* word was pronounced as 'sōgyō' using the Japanese input application (Image 7.7), he typed in '*jyūgyō*' to learn how to pronounce '従業 (員) (*jyūgyō(in)'*(an employee)) which Brian had mistakenly written as '授業(*jyugyō*)' (lecture) (Image 7.8). Po finally confirmed that '従業(員) (*jyūgyō(in)'*(an employee)), which Brian had mistaken for '授業(*jyugyō*)'(lecture), was pronounced as *jyūgyō(in)*.

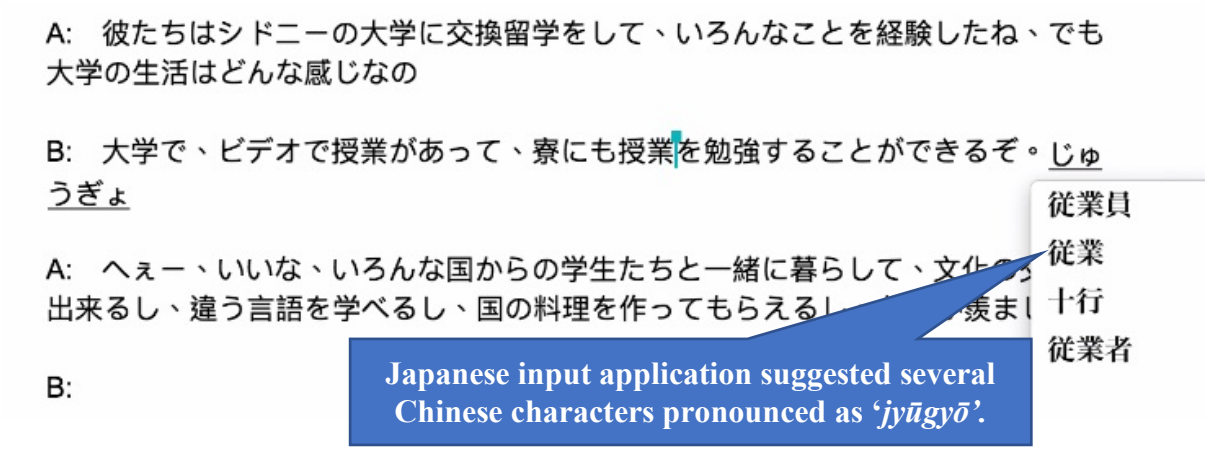


Image 7.8: Screenshot of input result in Po's laptop

Google Docs provides users with affordances to monitor what other users are writing in real time and to edit the same document synchronously and asynchronously. Using this affordances, Po spotted Brian's errors and provided corrections while their writing task was still in progress. Brian's erroneous *kanji word* also triggered Po's curiosity to learn more about the pronunciation of the *kanji* word using the Japanese input application. Thus, Excerpt 1 demonstrates how the use of online resources encouraged Pair 4, Brian and Po, to learn Japanese via LREs with 'limited engagement' in new ways. Such learning would be difficult to achieve without the use of these resources as they provided a platform to: 1) provide corrections in the middle of their writing tasks; and 2) confirm the pronunciation of words both participants did not know how to pronounce.

7.3.2 Participant searched online resources following a question from a peer

'Participant searched online resources (for information about Japanese vocabulary) following a question from a peer was demonstrated by Pair 2 (Kasumi/Sky), Pair 4 (Brian/Po), and Pair 6 (Jiyoung/Walter). Jiyoung (Image 7.9) and Sky searched online dictionaries using their mobile phone when their peers asked them a question about Japanese vocabulary that they could not answer. Po searched for synonyms of '面白い'(interesting) by consulting online dictionaries using his laptop as he could not recall any synonyms immediately after Brian had asked him.

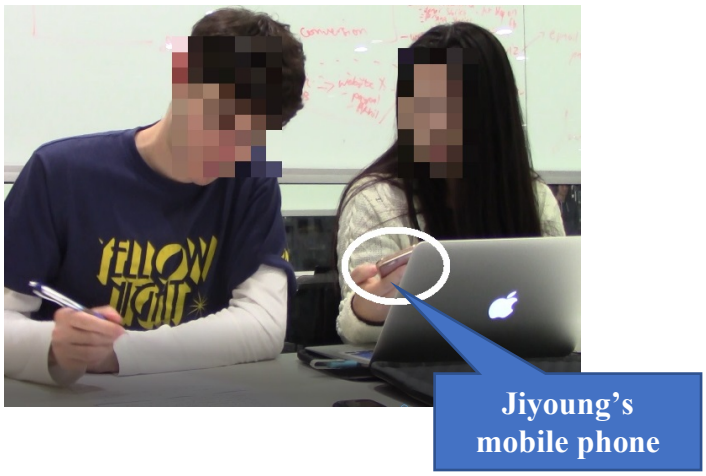


Image 7.9: Jiyoung (right) consulted her online dictionary using her mobile phone when asked about 'diversity' in Japanese by Waler (left)

Excerpt 2 is an example that demonstrates how using online resources helped Pair 4 (Brian/Po) to write their script using Japanese vocabulary that they could not recall by themselves. It occurred when Brian was writing descriptions of culture shock experienced by Japanese students in Australia (Image 7.10). As seen in Image 7.10, Brian used '面白い' (interesting) twice in sentences 1 and 3. Therefore, he thought he should avoid using '面白い' (interesting) in sentence 2 to state 'According to my friends, drunken people (seem to have an interesting time) in bars in Sydney'.

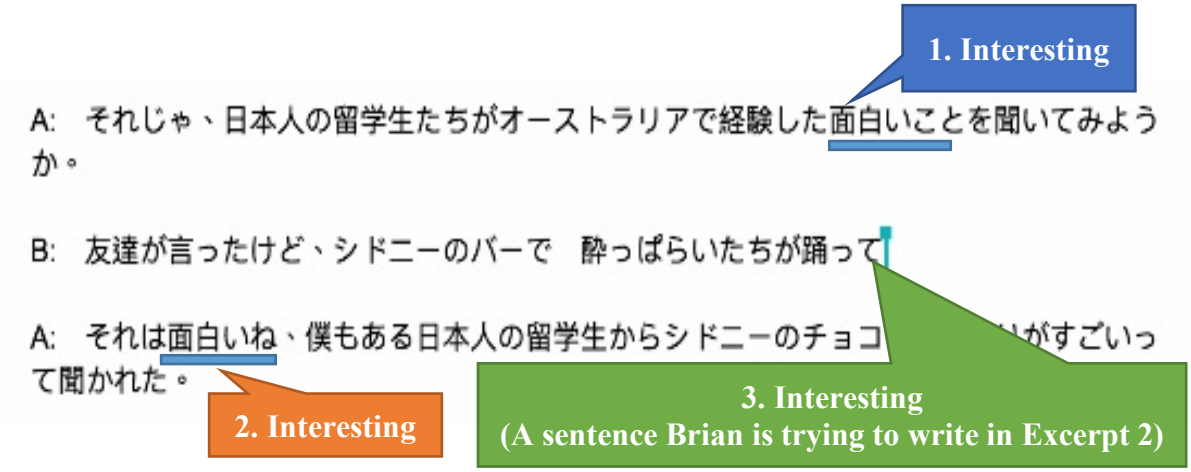


Image 7.10: Screenshot of Brian's lines written using Google Docs

Researcher translation of the above script

1. A: Then, why don't you ask Japanese international students **interesting** things they have experienced in Australia?
2. B: 'According to my friends, drunken people (seemed to have an **interesting** time) in bars in Sydney'.
3. A: That's **interesting**, isn't it? I have also heard from Japanese international students that the Chocolate festival in Sydney is great.

1. Interesting
3. Interesting
(A sentence Brian is trying to write in Excerpt 2)
2. Interesting

In Excerpt 2, to avoid repeating '面白い'(interesting) in sentence 2, Brian requested in Turn 1 that Po provide a synonym for '面白い'(interesting). Using affordances to monitor what other users are writing in real time, Po realised that Brian has already used '面白い'(interesting) twice within the three sentences (See Image 7.10). However, Po could not recall the synonym immediately to avoid using '面白い'(interesting) in the second sentence. Therefore, decided to find the synonym by using affordances of Google. He first typed '面白い'(interesting) and '類義語'(synonym) into the Google search engine and located the search results provided by an online dictionary; Weblio (https://ejje.weblio.jp/). (Image 7.11).

Excerpt 2

1. Brian: ((Looking at his sentences in Image 7.10 and asking Po to provide a synonym for '面白い'(interesting))). I don't want to use '面白い'(interesting) again.
2. Po: Maybe we can talk some differences I guess. ((Reading lines written by Brian (Image 7.10), started to laugh)) <hhh>
   ((Typed '面白い'(interesting) and '類義語'(synonym) into Google to find a synonym for '面白い'(interesting) for Brian. He browsed 'Weblio (https://ejje.weblio.jp/) which was the first result listed by Google and found a synonym for '面白い'(interesting))). 'コミカル'(comical). '楽しい'(fun). Umm.
   ((Advising Brian to use)) '楽しい'(fun)
3. Brian: '楽しそう'((It) seems fun).
4. Po: Umm. ((Po went back to writing his lines)).

5. Brian: ((Brian completed a sentence by conjugating '楽しい'(fun) as '楽しそう' ((it) seems fun) to state, 'According to my friends, drunken people (seemed to have fun) in bars in Sydney'.))

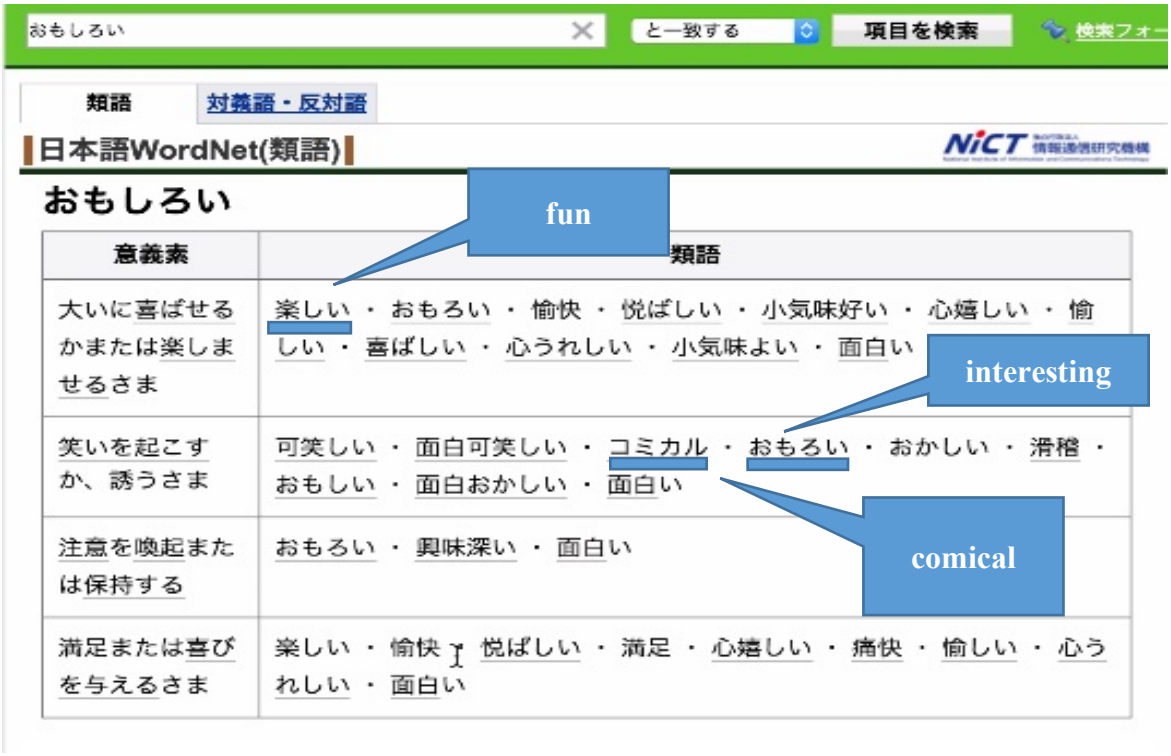


Image 7.11: Screenshot of Po's laptop showing search results in Weblio

After browsing through the search results in Weblio (Image 7.11), in Turn 2 Po suggested to Brian that he use '楽しい'(fun), and then went back to writing his lines (Image 7.12). Building on Po's suggestion, Brian further conjugated '楽しい'(fun) as '楽しそう'((it) seems fun)[44] to write, 'according to my friends, drunken people (seem to have fun) in bars in Sydney' (Image 7.12)

[44] The conjugation rule for 'そうだ (*sōda*)' can be found on page 128 in at Iori, I., Takashina, S., & Yamada, T. (2000). *Shokyū o oshieru hitono tame no Nihongo hando bokku* [A Japanese grammar handbook for people teach beginners]. Tokyo: 3A Corporation.

As seen in Excerpt 2, LREs with 'limited engagement' with a less proficient peer (Brian) provide Po, as an advanced level learner, with the opportunity to further learn Japanese by making him more aware of the gaps in his knowledge . Consequently, it prompted to him to further explore the synonyms he could not recall immediately by consulting online resources. In other words, using online resources in LREs with 'limited engagement' constructed opportunities for the participants to recall '楽しい'(fun), which both could not recall immediately, and also enabled them to complete their writing task using a Japanese word which was beyond the Japanese language level of both learners.

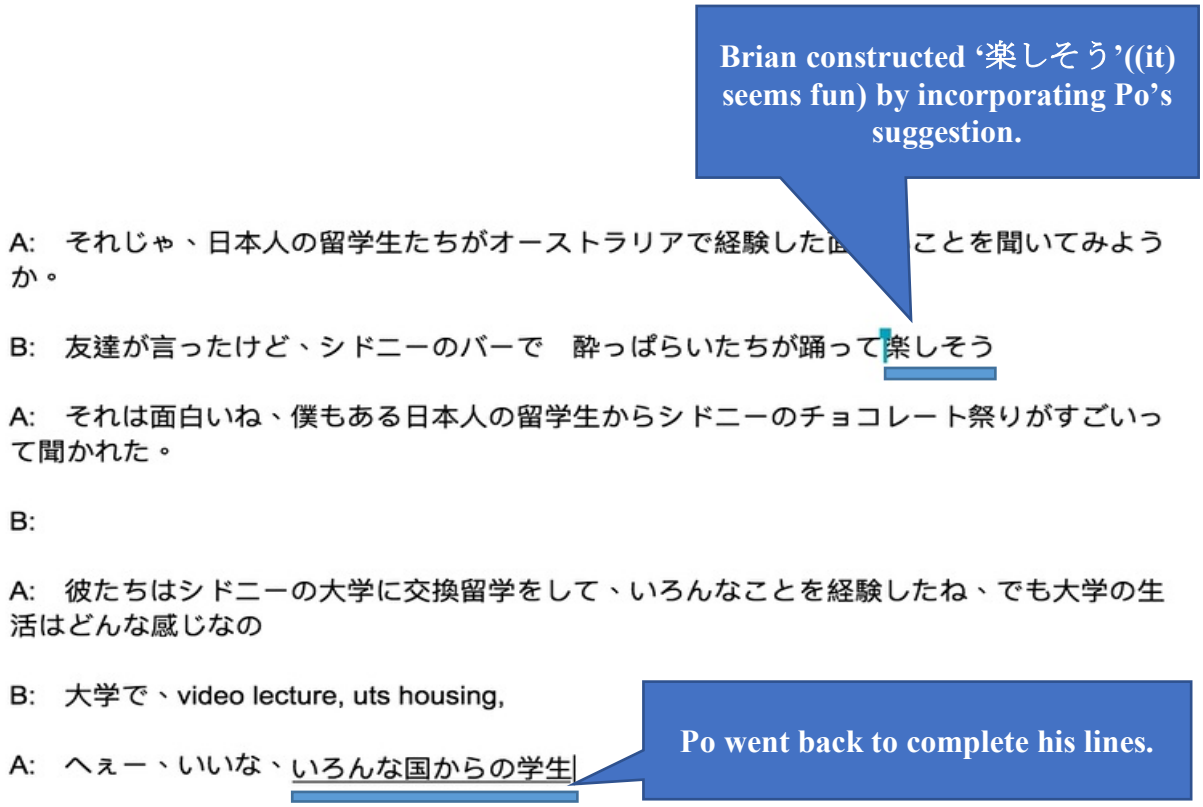


Image 7.12: Screenshot of Po's laptop showing both participants went back to complete their own lines

7.3.3 Solving language problems by searching online resources following peer explanation

'Participant searched online resources to resolve LREs following a peer explanation' was demonstrated by three learners (Jiyoung in Pair 1, Po in Pair 4, Yuki in Pair 5) to resolve language problems discussed in their LREs. Excerpt 3 shows an example of when a learner used online resources to consolidate their understanding of the lexical meaning discussed in their LREs with 'limited engagement'. It was recorded while Po (Pair 4) was composing a written description of a summer camp organised by the Australian and Japanese Student Association at his university based on interviews with Japanese students[45]. While monitoring Po when he was describing the memories of a summer camp experienced by Japanese students, Brian suggested to Po in Turn 1 that he describes '肝試し(*kimodameshi*)'(test of courage) which the Japanese students listed in their interviews as one of their most memorable experiences during camp .

'肝試し'(test of courage)[46] is a Japanese practice held at night during summer in which people visit scary places such as graveyards or haunted houses to test their courage and spiritual fears, and to enjoy the experience[47]. On the other hand, the English translation, test of courage, can be used in a wide range of contexts to describe bravely experiences for the speaker[48].

[45]This section can be retrieved from
https://www.youtube.com/watch?time_continue=134&v=aCG0ZvarSAc
Why don't you study at an Australian university? / オーストラリアの大学に留学しよう！！(2:10-2:45)
[46] Meaning of '肝試し'(test of courage) can be confirmed at
https://kotobank.jp/word/%E8%82%9D%E8%A9%A6%E3%81%97-475896
[47] For example, '肝試し'(test of courage) illustrated in a Japanese anime can be watched in the following site.
https://www.youtube.com/watch?v=dIyCFnSvFx8&list=PLwxUCHBVOAYxzl4h4Y75T8vFLa63f_fyo
[48] For examples, ABC, an Australian broadcasting, shares a wide range of bravely experiences by the storytellers in the following site. https://open.abc.net.au/explore?projectId=132

Po initiated to discuss LREs in Turn 4 to confirm a Japanese word used by Brian, '肝試し'(test of courage).

Excerpt 3

1. Brian: '肝試し (*kimodameshi*)'(Test of courage). Is '肝試し'(test of courage) ((inaudible))
2. Po: Umm?
3. Brian: Cause at camp we had …
4. Po: '*Ki*' what?
5. Brian: Amm. '肝試し'(Test of courage). It's test of courage.
6. Po: ((Po searched '肝試し'(test of courage) using his laptop and looked at the search Results presented in Image 7.13)). Oh, yeah, yeah, yeah.
7. Brian: Cause if you ask a few people who went to camp about what they remember, probably it would be a test of courage and karaoke and I guess the food.

In Turn 1, Brian interrupted Po who was writing his lines to suggest including '肝試し' (test of courage) in his section. Not knowing the meaning of '肝試し (*kimodameshi*)'(test of courage), Po asked Brian about the word in Turns 2 and 4. Brian provided the English translation, 'test of courage' in Turn 5.

However, the English translation, ‘test of courage’ does not carry the same cultural connotation of ‘肝試し’(test of courage)[49]. Because Po did not understand properly the meaning of Brian’s English translation, he further searched for the lexical meaning using his laptop. The search results included the definition of ‘肝試し’(test of courage) by Wikipedia[50] as well as images relevant to ‘肝試し’(test of courage) provided by Google (Image 7.13). Po associated the images for ‘肝試し’(test of courage) with a Japanese Anime scene he had watched. Po demonstrated his further understanding of the word by saying “Oh, yeah, yeah, yeah” in Turn 6.

Image 7.13: Screenshot of the Google search results on Po’s laptop

[49] ‘肝試し’(test of courage) and the English translation do not carry the same cultural connotation; they are used in different ways. For example, the English version of ‘test of courage’ is used such as, “Often the test of courage is not to die but to live”.
https://au.answers.yahoo.com/question/index?qid=20101025080305AAE9RdD&guccounter=1
https://eow.alc.co.jp/search?q=test+of+courage&ref=sa
[50] The Wikipedia meaning of ‘肝試し’(test of courage) can be retrieved from
https://ja.wikipedia.org/wiki/%E8%82%9D%E8%A9%A6%E3%81%97

Excerpt 3 highlights the role of online resources in enhancing the understanding of Japanese vocabulary as discussed in LREs with 'limited engagement'. Although Brian explained the meaning of '肝試し'(test of courage) by providing the English translation, Po chose to further explore the lexical meaning via a Google search due to the additional visual information provided by the platform. He explained the reasons as below:

> Google provides not only the definitions of words, but also images (related to the word). It has more information than dictionaries (provide).

Thus, Po's comments suggested that he intentionally used Google images to learn lexical meaning of the Japanese words by interpreting them as affordances for vocabulary learning. Excerpt 3 demonstrated that Po's LREs with 'limited engagement' with Brian created the context where an advanced level learner, Po, could become aware of his lack of lexical knowledge (e.g., '肝試し'(test of courage)) and further explore the lexical meaning by asking peers and by consulting with online resources. Visual images provided by Google further enhanced his understanding of the lexical meaning and the cultural connotation despite his discussing LREs with 'limited engagement'.

7.3.4 Both participants searched online resources to resolve language problems

'Both participants searched online resources to resolve language problems (addressed in collaborative dialogue)' was demonstrated only once by Pair 7 (Rena/Rita). However, Excerpt 4 is provided as an example of how a sample sentence provided by an online dictionary can resolve language problems despite the learners engaging in LREs with 'limited engagement'. Rena initiated the LRE discussion in Excerpt 4 as she wanted to know how to express 'proportion' in Japanese to compare the proportion of coffee bean to water in Australia and Japan[51].

Excerpt 4

1. Rena: How do we say 'proportion' (in Japanese?)
2. Rita: Proportion? ((Rita searched 'proportion' using her mobile phone and shared the results with Rena by passing her mobile phone to her. She moved to review the results of the online surveys with Japanese students.))
4. Rena: ((After Rena read the search results, she turned to the researcher to ask for the Japanese expression)) (Inaudible) Water to coffee for proportion.
5. Researcher: Umm?
6. Rena: Water to coffee for proportion.
7. Researcher: 私以外のものを使ってください。どうしたらいいでしょうか。

   Please use something else except me. What can you do?

[51] This section can be watched at https://www.youtube.com/watch?time_continue=1&v=EIJ9JwHHTwY Welcome to heaven for coffee lovers, Australia (Produced by Rena and Rita) (1:09-1:50)

8. Rena: ((残念そうな声で))ええー。(ノートパソコンで‘割合’を検索し、文章を完成させる。)

((Showing her disappointment)) *ee*. ((Rena searched ‘proportion’ using her laptop and completed the sentence.))

Although Rena requested an equivalent word for ‘proportion’ in Japanese, Rita did not know the Japanese word either. Therefore, Rita searched for the word using her mobile phone. Once she found the word, she passed her mobile to Rena in silence to share the search results (Image 7.14). While Rena was reading the search results in silence, Rita moved to the next task: to review the results of the online surveys with Japanese students (Image 7.15). Sharing the search results did not encourage the pair to further extend their discussion of the usage of ‘proportion’.

Image 7.14: Rita (left) is sharing search results with Rena (right)

Image 7.15: Rena (right) is reading the search results for ‘proportion’; whereas Rita (left) is reviewing the results of the online survey

Rather than further discuss the usage of ‘proportion’ with Rita, in Turns 4 and 6 Rena asked me how to say ‘proportion of water to coffee bean’ in Japanese. Because I asked Rena to resolve her language problem using resources other than me in Turn 7, Rena consulted an online dictionary, ‘*jisho*’ (dictionary) (http://jisho.org/) for information on the word usage.

Image 7.16 shows a screenshot of Rena’s laptop taken while she was browsing online sites for information about the usage of ‘proportion’. As Image 7.16 shows, the online dictionary provided not only the equivalent word in Japanese and the pronunciation, but also a sample sentence. As such, it indicated how Rena could use ‘割合’ (proportion) in a sentence.

The online dictionary suggested the following sample sentence to express ‘AのBに対する割合’ (proportion of A to B’):

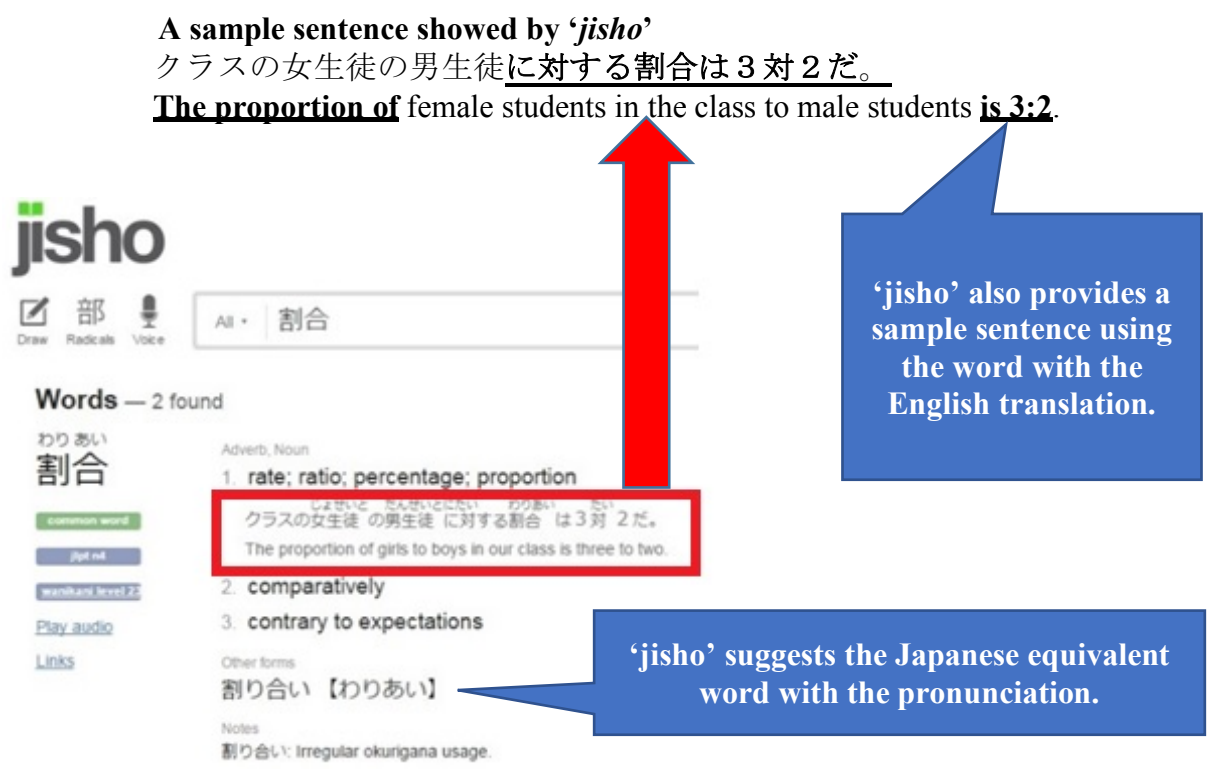


Image 7.16: A screenshot of research results for proportion in Rena’s laptop

Using the sample sentence displayed by '*jisho*' as a resource to address her lack of knowledge of how to use '割合'(proportion) correctly in a sentence, Rena completed the following Japanese sentence:

A Japanese sentence written by Rena
オーストラリアで水のコーヒー対する**割合は４対１**です。

Rena constructed this sentence using an expression provided by '*jisho*'; 'AのBに対する割合はC対Dです。'(Proportion of A to B is C: D).

Researcher translation of the above sentence
(When we make coffee) in Australia, (coffee is made with) the **proportion of** water to coffee bean is **4:1**.

Rena constructed this sentence using an expression provided by '*jisho*'; 'AのBに対する割合はC対Dです。'(Proportion of A to B is C: D).

Thus, Pair 7's (Rita/Rena) use of online resources did result in them discussing their language problems beyond LREs with 'limited engagement'. However, Excerpt 4 demonstrated the way in which a sample sentence provided by an online dictionary still allowed the learner to construct a Japanese sentence beyond her Japanese proficiency level despite engaging in only LREs with 'limited engagement' with her peer.

7.3.5 Learner asked researcher following a search of online resources

'Asking the researcher following a search of online resources' was used by Pair 5 (Lucie/Yuki) only due to the different data collection scenario for the pair; namely, my agreement to answer their Japanese questions. Excerpt 5 provides an example of how the participants may use Japanese native speakers situated in their immediate learning contexts (e.g., the researcher or Japanese language teachers) as learning resources. The excerpt occurred while Pair 5 (Lucie/Yuki) was writing their own section individually. Lucie constructed a Japanese expression, '目の覚めるような赤い葉'(vivid red leaves (as if they wake us up with the vivid colors) by looking up descriptive words for 'vivid' and by consulting online dictionaries. However, she was not sure whether the expression she used was appropriate in Japanese. Therefore, she initiated Excerpt 5 to discuss the appropriateness of the expression with the Japanese researcher by perceiving me as a learning resources of Japanese.

Excerpt 5

1. Lucie: Is that ok? '目の覚めるような赤い葉'(Vivid red leaves (as if they wake us up with the vividness).
2. Researcher: いい表現ですね。目の覚めるような赤い葉。
   That's a good expression. Vivid red leaves (as if they wake us up with the vividness).
3. Lucie: ((Lucie explained to the researcher how she constructed the expression)) '辞書で'((I found the expression) in a dictionary).

Because Lucie was unsure about whether the expression was appropriate in Japanese, in Turn 1 she requested confirmation from the researcher (Image 7.17). After the researcher complimented the expression in Turn 2, Lucie understood that the expression was appropriate for use and she then started to explain how she had constructed the expression to the researcher. Thus, Excerpt 5 demonstrates how brief a LRE with 'limited engagement' served as an opportunity for Lucie to confirm the appropriateness of Japanese expressions she constructed using online resources. The findings also suggest that some participants may interpret Japanese native speakers such as the researcher and Japanese teachers situated in their immediate learning environment as learning resources even though they are expected to engage in collaborative learning tasks/projects with peers. Such resource use may encourage language learners to explore their creative and personal expressions, and to use them confidently.

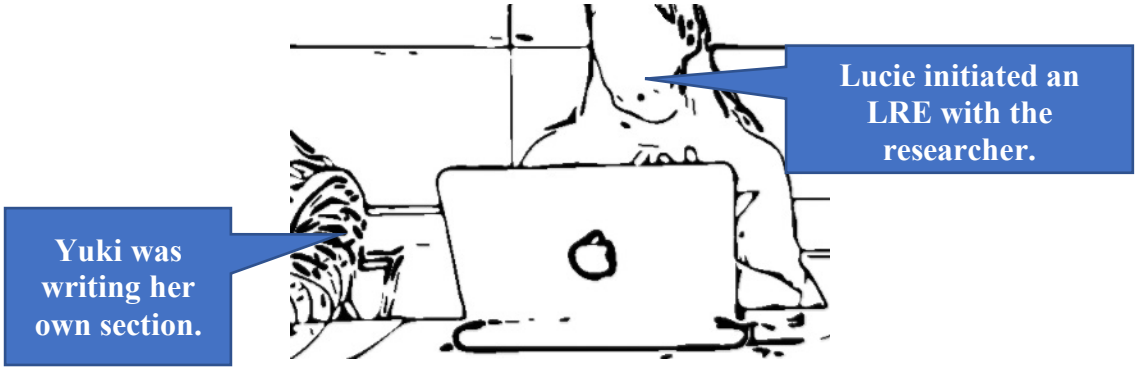


Image 7.17: Lucie sought confirmation from the researcher about whether the Japanese expressions she constructed using online resources were appropriate as Japanese

7.3.6 Summary of resources used to resolve LREs

This section examined the types of resources used by the seven participant pairs to resolve LREs. Although the linguistic knowledge of 'one participant' and 'both participants' were the most common resources used to resolve LREs, 10% of the LREs were resolved using online resources. As discussed in Section 7.2.3, resolving LREs using online resources triggers slightly more LREs with 'limited engagement' which Storch (2008) has asserted is less effective for learning.

However, the findings in Section 7.3 also highlighted the significant role played by online resources in enhancing language learning in LREs with 'limited engagement'. Figure 7.2 summarised the role of online resources to enhance language learning in collaborative dialogue, in LREs with 'limited engagement' particularly. As seen in the Figure, using online resources in collaborative dialogue enhanced the pair participants' language learning by providing additional linguistic information such as: 1) writing of kanji words and their pronunciation; 2) Japanese vocabulary not known or immediately recalled by either participant; 3) lexical (and visual) information about a Japanese word; and 4) sample sentences that the participants can use to construct Japanese sentences.

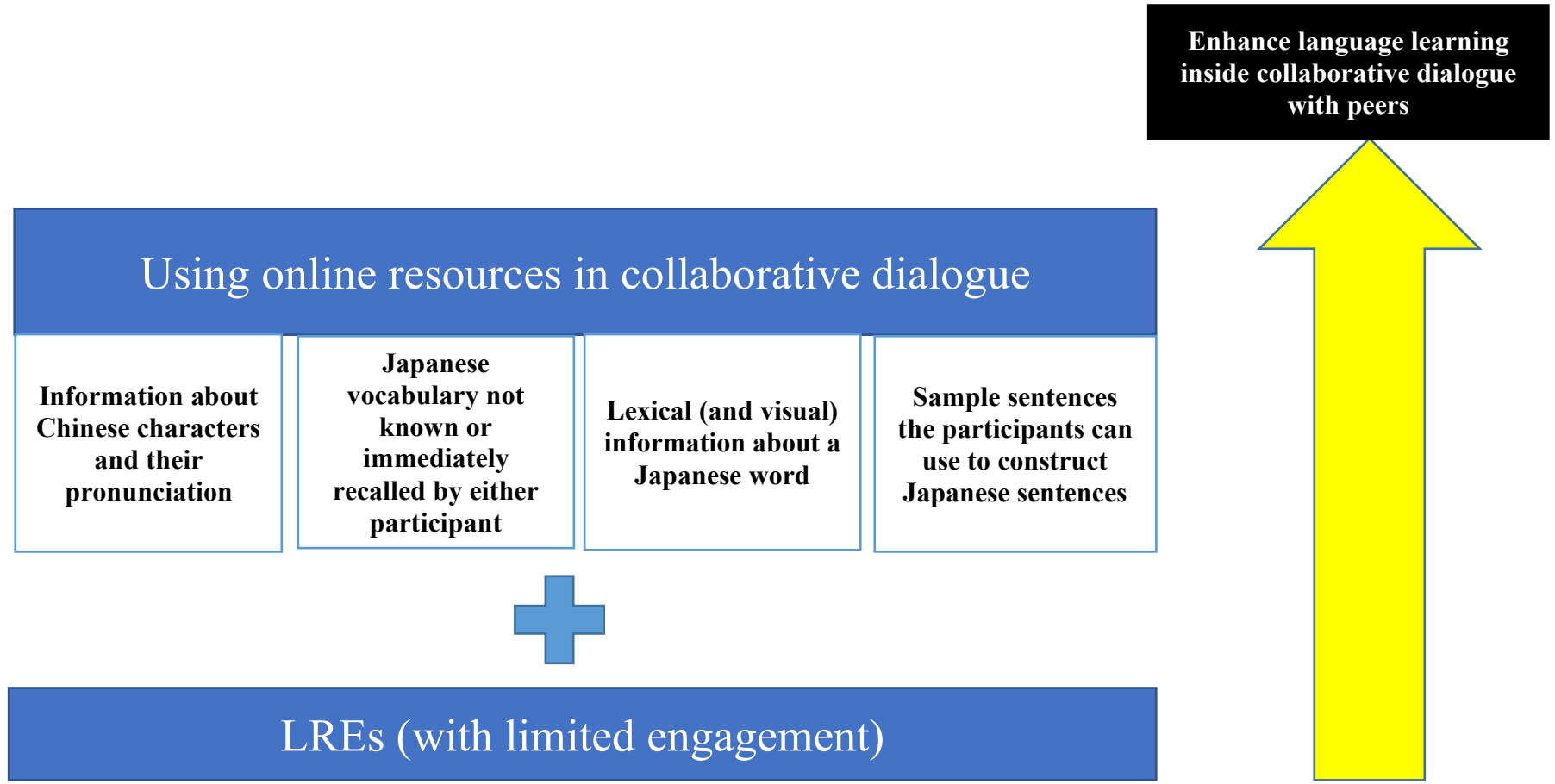


Figure 7.2: Roles of online resources to engage in language learning in collaborative dialogue

7.4 Engaging in learning Japanese outside collaborative dialogue with peers

Sections 7.2 and 7.3 discussed how the participant pairs engaged in learning Japanese using alternative resources in collaborative dialogue with peers. This section focuses on the language learning engaged in by the participants outside collaborative dialogue with peers. In this section, the discussion centres on how the participants engaged in learning Japanese in two learning contexts outside collaborative dialogue with peers: 1) learning Japanese individually during the sessions using online resources; and 2) engaging in language learning outside the sessions using alternative resources.

To explore the participants' language learning outside collaborative dialogue with peers, the research analysis focus was shifted from the LREs they discussed to the 'material resources' and 'social resources' they used to engage in language learning (Palfreyman, 2006, 2014). This shift was undertaken for two reasons: first, language learning outside collaborative dialogue involves interactions with resources used to engage in language learning; and second, due to the difficulties accessing the participants' interactions with Japanese native speakers and other resources which occurred outside the sessions. For these reasons, three types of data were analysed (video recordings of the sessions, semi-structured interview responses, and the mind-maps drawn by the participants) using the categories presented in Tables 7.5-7.7. First, Section 7.4.1 provides distribution of resources the participants used to engage in language learning outside collaborative dialogue with peers during this project. Section 7.4.2 illustrates their use of materials resources for language learning, followed by the one of social resources (Section 7.4.3).

7.4.1 Resources used for language learning outside collaborative dialogue

In this project, the participants were encouraged to decide for themselves how they work on this project. As a result, the participants interpreted the context as a 'discursive resource' legitimating them to employ any resources to "[construct] the terms and conditions of their own learning" (Lantolf & Pavlenko, 2001, p. 145). The findings showed that the participants, as 'an agent of learning', actively employed a wide range of learning resources to meet their learning needs or to engage in learning Japanese with their preferred ways. Table 7.11 summarised resources used by the participants to engage in learning Japanese outside the sessions. As Table 7.11 indicates, eight types of material resources were used to support language learning outside the sessions, whereas four types of social resources were adopted for the purpose.

Pair 6 (Jiyoung/Walter) worked on the same part of their tasks together throughout their project except when recording the narrative and editing the video. Therefore, the pair reported to use only two types of resources to learn Japanese outside their sessions; audio recordings and a Japanese researcher.

Table 7.11: Distribution of resources used to learn Japanese outside collaborative dialogue

Online/ Non-online		**Material resources**								**Social materials**			
Sub-categories of resources		Online resources					Non-online resources			Japanese friends		Japanese in online community	Japanese researcher
		Online dictionary	Websites	Google Trans.	Facebook chat	Google Docs	University-related materials		Audio rec.				
							Text book	Note book		Japanese on campus	Japanese friends living in Japan		
Total number		12	6	3	3	4	4	1	3	4	2	1	7
Pair 1	Tessie	○	○	○			○						○
	Yujin	○											
Pair 2	Kasumi	○	○	○	○						○		
	Sky	○			○				○	○			
Pair 3	Sherry	○				○						○	
	Steph.	○	○			○			○	○			○
Pair 4	Brian	○				○				○			
	Po	○	○			○	○			○			○
Pair 5	Lucie	○	○										○
	Yuki	○		○									○
Pair 6	Jiyoung												○
	Walter								○				
Pair 7	Rena	○					○						○
	Rita	○	○		○		○	○			○		

7.4.2 Materials resources

Material resources used by participants outside collaborative dialogue with peers can be classified as either 'online resources' or 'non-online resources'. The online resources they used were: 1) online dictionaries; 2) websites; 3) Google Docs; 4) Google Translate; and 5) Facebook chat. The non-online resources they used were: 1) textbooks; 2) notebooks written during lectures; and 3) audio recordings (Table 7.12).

Table 7.12: Types of material resources used outside collaborative dialogue

Materials resources						
Online resources					Non-online resources	
Online dictionary	Websites	Google Translate	Facebook chat	Google Docs	University-related materials (textbooks, notebooks)	Audio recordings

1) Online dictionaries

Online dictionaries were the resources most commonly used by the participants to resolve their language problems outside collaborative dialogue with peers. All participant pairs excepting Pair 6 (Jiyoung/Walter) who wrote their entire script together used an online dictionary to locate unknown words in Japanese outside the sessions. Five types of online dictionaries were used by the participants (see Table 7.13) to resolve their language problems outside of collaborative dialogue with a peer:

Table 7.13: Types of online dictionary

Name	**Web address**
Weblio	(https://ejje.weblio.jp/)
jisho	(http://jisho.org/)
IMIWA?	(http://www.imiwaapp.com/)
Tangorin	(http://tangorin.com/)
rikaichan	https://addons.mozilla.org/en-US/firefox/addon/rikaichan/

The participants perceived and acted on three types of affordances provided by online dictionaries; including the ones to 1) locate unknown Japanese words self-efficiently; 2) learn *kanji faster and* enjoyably; and 3) find vivid and strong words.

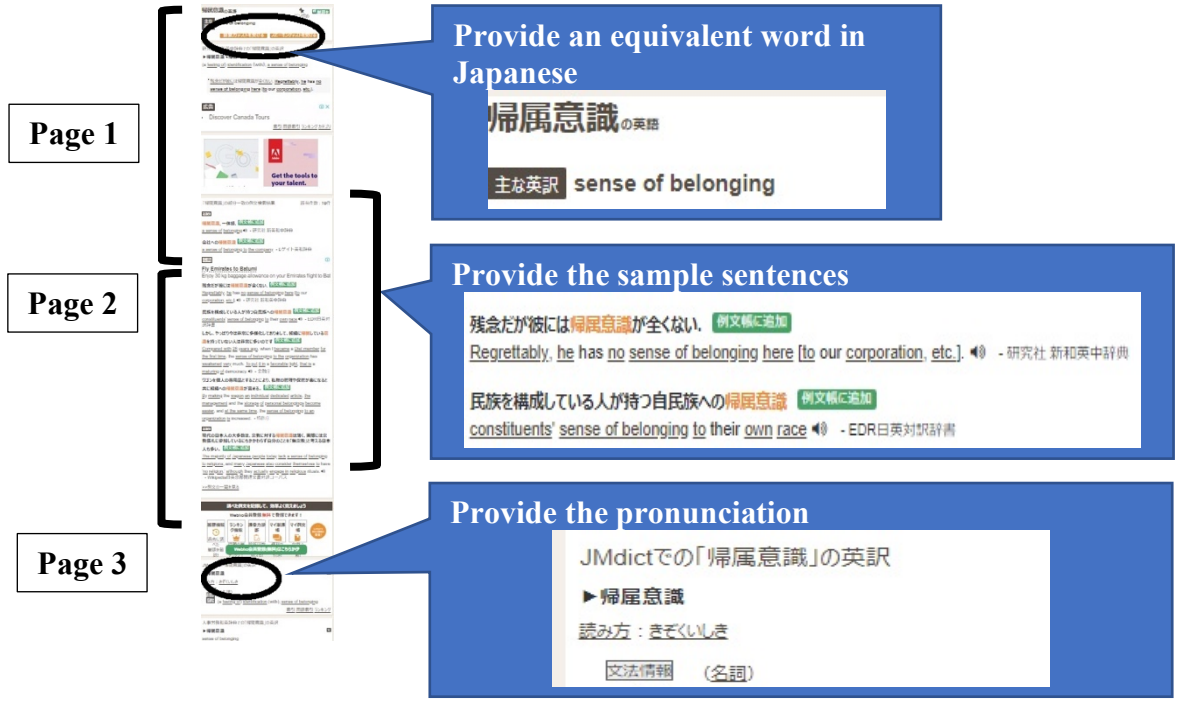
The first type of affordance, locating unknown Japanese words self-efficiently, was used by a less proficient learner, Tessie. What Tessie was concerned with during this project was not to bother Yujin, whom she did not know well, by asking a lot of Japanese related questions. One of the strategies Tessie used to avoid the risk was to locate unknown Japanese using online dictionaries instead of asking Yujin. The strategy enabled Tessie to find Japanese words she wanted to use in her script or to confirm the lexical meaning of the words. Consequently, the strategy reduced frequency of asking Yujin Japanese words. In other words, Tessie used an affordance of online dictionaries to learn Japanese vocabulary in her preferred learning style; resolving lexical problems self-efficiently.

The second type of an affordance, learning *kanji* words faster and enjoyably, was used by an advanced learner from non-Chinese background, Lucie. She has realised her non-Chinese background put her in disadvantage to learn *kanji* words, compared with Chinese-background learners of Japanese. As a strategy to overcome the disadvantage, Lucie decided to use two online dictionaries providing different affordances; 'Weblio' and '*rikai chan*'.

'Weblio' English/Japanese dictionary was developed by a Japanese company particularly for Japanese users[52]. The dictionary provides equivalent words in English/Japanese as well as sample sentences to show how to use the word correctly. The drawback of using 'Weblio' for non-Japanese users is lack of accommodation to learn pronunciation of *kanji* words used in the dictionary: The users have to scroll down approximately two pages of their screen to confirm

[52] Information of the company developed 'Weblio' English/Japanese dictionary can be found at https://www.weblio-inc.jp/service/ (Retrieved at August 31, 2018).

pronunciation of the word they have searched for (See Image 7.18)[53]. 'Weblio' does not indicate pronunciation of *kanji* words used in the sample sentences, either.



Images 7.18: Screenshot of Weblio English/Japanese dictionary (The researcher reproduced the above search result.)

On the other hand, '*rikai chan*[54]', an add-on online dictionary for Firefox, is designed to indicate pronunciation of *kanji* words used in other websites. The users can confirm the pronunciation by highlighting *kanji* words used in other websites.

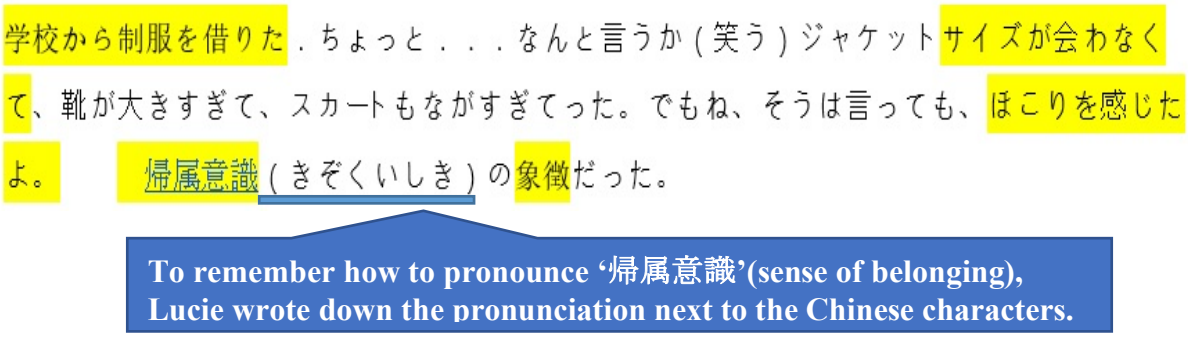
To compensate the limitation of using 'Weblio' for learning *kanji* word pronunciation, Lucie decided to use an affordance of '*rikai chan*'; indicating pronunciation of *kanji* words used in 'Weblio' by using '*rikai chan'*. Below sentences shows a part of English script written by Lucie. To rewrite the sentences in Japanese (See Image 7.19), Lucie used the two

[53] For example, to confirm pronunciation of '帰属意識'(sense of belonging), the users have to scroll down two third of the page. See https://ejje.weblio.jp/content/%E5%B8%B0%E5%B1%9E%E6%84%8F%E8%AD%98 (Retrieved at August 31, 2018).

[54] The chrome users can use a similar application named as '*rikai kun*'. The application can be downloaded at https://chrome.google.com/webstore/detail/rikaikun/jipdnfibhldikgcjhfnomkfpcebammhp?hl=en (Retrieved at September 1, 2018).

dictionaries. Highlighted sections show Japanese words Lucie constructed by consulting with online dictionaries.

A part of English script written by Lucie
My school uniform, I borrowed from the school. It didn't (quite) fit me (laugh). It was actually a bit too large for me - the jacket was too tight, and the shoes too big, and the skirt too long. Still, I felt (so) proud of it. It was a mark of belonging, in a way. It was a bit of a symbol.



Images 7.19: Sentences Lucie constructed by using two online dictionaries

In particular, Lucie used affordances of both 'Weblio' and '*rikai chan*' to construct the last sentence in Image 7.19: '(私にとって日本の高校の制服は）帰属意識の象徴だった。'((For me, Japanese high school uniform) was a symbol of belonging (to the school). First, Lucie searched a Japanese word for 'sense of belonging' using 'Weblio'. Once Lucie understood that '帰属意識'as an equivalent word for 'sense of belonging' in Japanese, she then indicated the pronunciation by using '*rikai chan*' to learn how to pronounce the *kanji* (See Image 7.20).

Images 7.20: '*rikai chan*' shows the pronunciation and meaning of *kanji* words (The researcher reproduced the above search result using Weblio and '*rikai chan*' based on the semi-structured interview with Lucie.)

Regarding the benefits of using online dictionaries for non-Chinese background learners of Japanese, Lucie elaborated as below:

> It [online dictionary] gives me more power. If you just have just '*kanji*' (Chinese characters), it is hard to know where to go, especially from my (non-Chinese) background. I cannot see what it means. But online resources are faster (to find the meaning and the pronunciation) and makes it more interesting (to learn Japanese words written Chinese characters).

As Lucie commented, she used different affordances provided by two online dictionaries as a strategy to overcome her disadvantage as a non-Chinese background learner. The strategy use enabled Lucie to learn *kanji* word faster and enjoyably. In other words, her expertise of online resources and her desire to overcome her disadvantage as a non-Chinese background learner enabled her to construct her desired learning condition; learning *kanji* words faster and enjoyably.

The third affordance of online dictionaries, finding vivid and strong words, was used by Yuki, another advanced learner of Japanese. One of challenges Yuki has encountered during writing stage was to use 'vivid and strong words' to describe her memories in Japan. Given

Yuki's advanced level of Japanese, she could have completed her script by relying on her existing Japanese vocabulary. However, Yuki believed that such digital story is "boring and (it) does not show [their] emotion into it". Yuki asserted the importance of using vivid and strong vocabulary to enhance audience engagement with her digital story during the semi-structured interview:

> We can just write normally, but because we want to show more of our emotions and create imagery in the audience's head, we use words that are more vivid and stronger. It's different, too, (comparing with saying) like beautiful flowers. If we use these nice words, then you'll remember it more. It makes (our story) more unique. They can remember, and they can feel the emotions more intensely.

To intensify audience's engagement in her digital story, Yuki decided to use an affordance of online dictionaries; locating vivid and strong words to arouse her audience' emotion. The following sentences shows a part of English script written by Yuki, whereas Image 7.21 indicates the Japanese script constructed by Yuki using online dictionaries. Highlighted words shows the ones Yuki found by consulting online dictionaries.

A part of English script written by Yuki
Second week of exchange. I noticed the petals of the cherry blossom tree outside of my room falling. I decided to go outside to look at the trees. Enchanted by the cherry blossoms, I walked[55] from one cherry blossom tree to another, to another, and another, until I realized I didn't know where I was. I was lost.

ある日、部屋の外にある桜の花びらがゆっくり舞い落ちていた。桜の木を見に外に行った。桜の美しさに魅せられて、桜の木を一本一本見詰めながら、自分はどこにいるかを気づかなかった。

Image 7.21: A part of Japanese script written by Yuki using online dictionaries

[55] Yuki rewrote the Japanese sentence by replacing 'walked' with 'look at'.

As seen in Image 7.21, Yuki used 'vivid and strong' Japanese words she has located using online dictionaries such as '魅せられる'(enchant) and '見詰める'(look at). She used '見詰める'(look at) instead of '見る'(look) to describe how intensively she looked at trees of cherry blossoms. To describe the beautify of the cherry blossom using a simple adjective such as 'beautiful'(美しい). However, she rather chose to consult online dictionaries in order to construct Japanese sentences using a more powerful verb; '魅せられる'(enchant); '桜の美しさに魅せられた'(I was enchanted by the beauty of the cherry blossom). Thus, Yuki's strong desire to create a digital story arousing emotion of her audience encouraged her to act on the third type of affordances provided by online dictionaries; locating vivid and powerful Japanese words.

2) Websites

The participants used websites for two purposes; 1) to locate topic-related information; 2) to resolve language problems outside collaborative dialogue with peers. Regarding their use of websites as linguistic resources, the participants perceived and acted on the following three kinds of affordances provided by websites; 1) identifying topic-related vocabulary; 2) confirming Japanese usage; and 3) exploring expressions frequently used by Japanese.

First of all, websites was perceived and used as affordances to identify topic-related vocabulary by a less proficient learner, Tessie. The initial reason Tessie explored topic-related websites was to find background information including in her digital story. As Tessie suggested Yujin to complete their writing task individually, Tessie had to develop her story as well as write her Japanese script by herself. However, while browsing topic-related websites, Tessie found a short video clip provided by '*Matsuri* in Sydney' (Festival in Sydney) (http://archive.matsurisydney.com). She realised English and Japanese bilingual subtitles

indicated by the video clip can be used as a resource to identify festival-related Japanese words which she could include in her digital story (See Image 7.22).

Using the affordance of the video clip, Tessie identified festival-related Japanese words such 'たこ焼き(*takoyaki*)'(octopus dumpling) and '焼き鳥(*yakitori*)'(char-broiled chicken). She then integrated these Japanese words in her Japanese script as well as the Japanese subtitles (See Image 7.23).

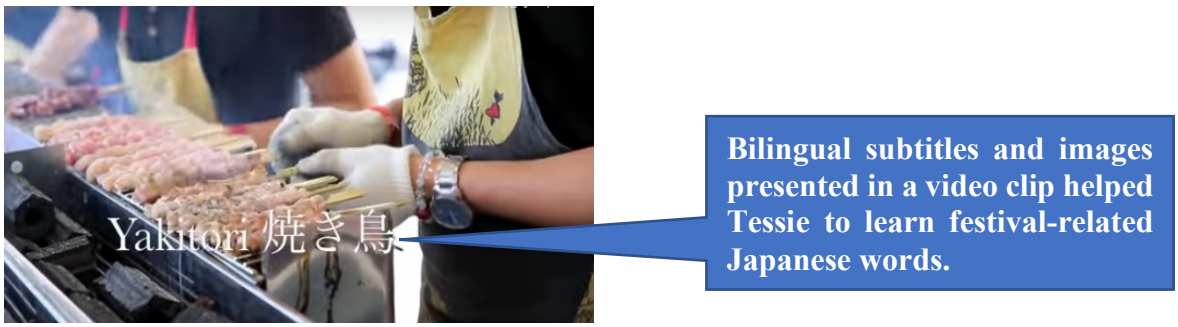


Image 7.22: Screenshot of a video clip Tessie used to learn festival-related Japanese words

Image 7.23: Subtitles Tessie created by incorporating festival-related Japanese words which she has learned in the video clip

Summarising, browsing topic-related websites helped Tessie to discover a video clip describing Japanese traditional festival. Tessie's ability to perceive the clip as an affordance providing festival related vocabulary enabled her to resolve her lexical problems self-efficiently; identifying festival related vocabulary without relying on her peer. In other words, her capability to perceive, and to use the affordance of the video clip to learn topic-related vocabulary enabled her to meet her learning needs; finding topic-related vocabulary self-efficiently.

Secondly, websites were used as an affordance to confirm Japanese grammar outside the sessions by Kasumi. At the time of data collection, she had enrolled in English/Japanese translation class. Therefore, she was motivated to create a bilingual video using 'right words and connotation' by applying what she had learned in the translation class. One of the resources she used to achieve the goal was English websites describing Japanese grammar. The strategy Kasumi used to find such websites was to type 'how to say this in Japanese?'. She reported that a few grammar related websites continuously popped out after she typed the question to Google (See Image 7.24).

Image 7.24: Grammar-related websites indicated by Google (The researcher reproduced Google search result based on the semi-structured interview with Kasumi.)

Kasumi used these websites to confirm usage of Japanese grammar she was not sure of. She asserted that reviewing these websites helped her to understand "the grammar point [she] meant to use". Thus, Kasumi exercised her agency using an affordance of websites to construct her desired learning condition; confirming Japanese grammar in learning contexts where neither her peer or the native speakers are available.

Finally, websites were also used as resources to explore Japanese expressions frequently used by the native speaker. Majoring in 'Media Arts and Production', Lucie had a desire to use artistic but natural expressions as Japanese. To achieve the goal, Lucie explored Japanese expressions used in sample sentences in 'Weblio' but also other websites written by Japanese. Using the strategy, Lucie first observed how the expression was typically used in a sentence. She then judged whether or not the expression she had constructed was similarly used by other Japanese language users. Synthesising her Japanese with the expressions used in the websites, she constructed artistic and natural expressions such as '目の覚めるような赤い葉'(vivid red leaves (as if they wake us up with the vividness). Lucie compared her writing approach with a character in a 'Frankenstein: or The Modern Prometheus'; who created a monster by combining dead bodies of human beings.

Thus, Lucie demonstrated how an affordance of websites can empower a language learner as 'a competent writer'; observing how the native speakers use the expression and synthesising the expression in their writing to express her perspective.

3) Google Docs

Google Docs is an application designed to allow multiple users to edit the same document synchronously or asynchronously. A less proficient learner, Stephanie, interpreted this function as an affordance to increase her participation in a writing task self-efficiently which was beyond her Japanese proficiency level.

When Stephanie and Sherry began writing their Japanese script, Sherry took on the role of 'writer' for a few minutes as they only had access to one laptop and due to the large Japanese language proficiency gap between the pair. Under these circumstance, all Stephanie could do was to monitor what Sherry was writing and to provide suggestions to her if she could (Image 7.25).

Image 7.25: Stephanie (right) is watching what Sherry (left) is writing

The problem of taking such working approach for Stephanie was that it conflicted with her preferred learning style; leaning self-efficiently. Stephanie predicted that writing with Sherry would create a context where Sherry has to explain usages of Japanese to Stephanie as a Japanese teacher. Stephanie expressed her strong hesitation toward such a working approach by stating "Well, Shelly isn't a teacher, and I don't expect her to spend her whole time teaching me new grammar points (to me)".

Reflecting prior experiences of using Google Docs in group projects, Stephanie realised she could construct a context where she could work on the writing task without receiving Sherry's help; writing easy sections using Google Docs while Sherry was writing different sections. Therefore, Stephanie suggested to Sherry to write their Japanese script using Google Docs shortly after the writing session started. Sherry, who has used Google Docs while working on other group assignments, agreed with Stephanie's suggestions. They started to write their script using Google Docs to complete different sections simultaneously (Image 7.26).

Image 7.26: Stephanie (right) and Sherry (right) are completing different sections of their Japanese script

To encourage Stephanie to write the sections of the script she could complete independently, Sherry first encouraged Stephanie to complete the short and easy sections. Sherry then edited the sentences written by Stephanie and also completed the uncompleted sections (see the semi-structured interviews with Sherry and Stephanie). Table 7.14 shows the revision history of their script generated by Google Docs. The section completed by Stephanie is underlined; whereas the section written by Sherry written is presented in grey:

Table 7.14: A part of revision history of script written by Pair 3 (Sherry/Stephanie)

Time	Scene	English script	Japanese script *(Researcher English translation for the above Japanese)*
	4. Title: Food	*(music)* **TITLE: FOOD AND SHOPPING**	**SUBTITLE: 食べ物と買い物** **((Subtitle: Food and shopping))**
	(Omission)	*(Omission)*	*(Omission)*
	12. Japan Foundation Library	1) Japanese students often come to study at the Japanese Foundation Library because there are many resources here. 2) Many Japanese people also come here to borrow Japanese newspapers and books.	1) 日本語を勉強する学生はよく国際交流基金で勉強をしに行きます。 *Students who study Japanese often go to Japan Foundation to study Japanese.* 2)たくさん日本語の本や勉強の資料があるおかげで学生にとしてとてもいい場所なのです。 *Due to having a lot of Japanese books and resources to learn, this is a good place for learners.* (Omission)

Section 1
Stephanie completed the short and easy phrases.

Section 2
To simplify the writing task, Stephanie rewrote the main clauses only.

Section 3
To simplify the writing task, Stephanie rewrote only a part of the phrases.

Stephanie used several strategies to participate in the writing task beyond her Japanese language proficiency level. The first strategy is to complete the short and easy phrases such as '食べ物と買い物'(food and shopping) (See Section 1 in Table 7.14). Another strategy Stephanie used is to simplify a Japanese sentence by rewriting only the main clauses (See Section 2 in Table 7.14). The following sentences show two steps Pair 3 (Sherry/Stephanie)

completed a Japanese sentence, ‘日本語を勉強する学生はよく国際交流基金で勉強をしに行きます。’(Students who study Japanese often go to Japan Foundation to study Japanese).

> **Pair’s English sentence**
> Japanese students often come to study at the Japanese Foundation Library because there are many resources here.
>
> **Step 1) Simplified sentence by Stephanie**
> 1)学生はよく国際交流基金で勉強をしに行きます。
> Students often go to Japan Foundation to study Japanese.
>
> **Step 2) Sentence revised by Sherry**
> 日本語を勉強する学生はよく国際交流基金で勉強をしに行きます。
> Students who study Japanese often go to Japan Foundation to study Japanese.

First, Stephanie rewrote only main clause of the above English sentence to Japanese in order to participate in the writing task in her Japanese proficiency level. Once Stephanie completed the main clause of the Japanese sentence, Sherry added the modifier, ‘日本語を勉強する’(study Japanese) to the simplified sentence using Google Docs to reproduce a similar meaning to that presented in their initial English script.

Third strategy employed by Stephanie is to rewrote only the part of phrase she could rewrite in her Japanese level such as ‘たくさん日本語の本’(many Japanese books). Sherry would then help to complete the rest of the sentence by using the phrase used by Stephanie (See Section 3 in Table 7.14).

Summarising, Stephanie used an affordance of Google Docs to participate in a writing task beyond her Japanese proficiency level as a self-efficient writer. Her desire to work self-efficiently, her awareness of, and ability to use, Google Docs for the learning purpose enabled her to construct a self-efficient learning condition which would have otherwise been difficult to achieve.

4) Google Translate

Google Translate (https://translate.google.com.au/) enables users to access a translation of many sentences or a whole web page within a few seconds (See Image 7.27). Applying the affordance differently, the participants used Google Translate to meet different learning needs; 1) understanding overall meaning; and 2) detecting errors in own writing.

Image 7.27: Google Translate

First of all, Google Translate was used as a resource to understand the overall meaning of sentences written by Tessie. Due to division of writing task, Tessie had to search many words using online dictionaries while writing her script. As a result, she could not recall meaning of the script she had written by the time she needed to record her narrative or she added subtitles to her section. To overcome the problem, Tessie decided to use Google Translate to understand the overall meaning using Google Translate. Tessie commented that the strategy helped her to understand meaning of her Japanese narration easily despite some errors. Thus, Tessie's strategic use of Google Translate demonstrates how an affordance of Google Translate enabled a less proficient learner to confirm the overall meaning of her text without relying on a more proficient peer.

Google Translate was also used by participants as a resource to detect errors in their written sentences in the context where they cannot access either proficient peer or Japanese native speaker friends. For instance, Kasumi realised that she had to translate introduction and conclusion of their digital story into Japanese urgently because her peer (Sky) was ready to edit their video clip. Due to the urgent circumstances, Kasumi decided to use Google Translate to detect her Japanese errors instead of asking her Japanese friends in Japan to provide feedback (See Image 7.28).

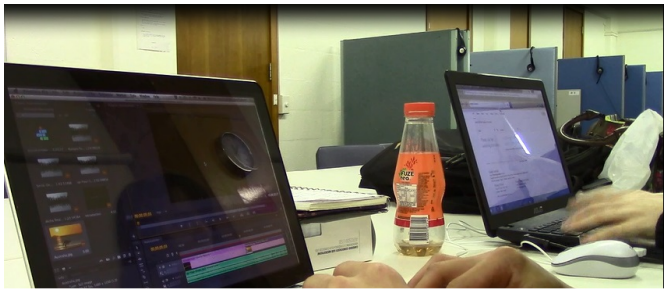


Image 7.28: Kasumi (right) is translating and detecting errors using Google Docs while Sky (left) is editing their digital story

Kasumi perceived an affordance of Google Translate as the capably to check whether or not she used "right grammar and right conjugation". Using the affordance, she detected word in wrong place and conjugation errors in her translation. Image 7.29 shows a part of telop she created using the affordance of Google Translate. As seen in Image 7.29, she constructed the sentence using right word order despite some minor Japanese errors in the word choice and conjugation. Thus, Kasumi's creative use of Google Translate suggested that an affordance of Google Translate is to support language learners to detect and revise own linguistic errors self-efficiently in the contexts where the native speakers or proficient peers are not available to help correcting their errors.

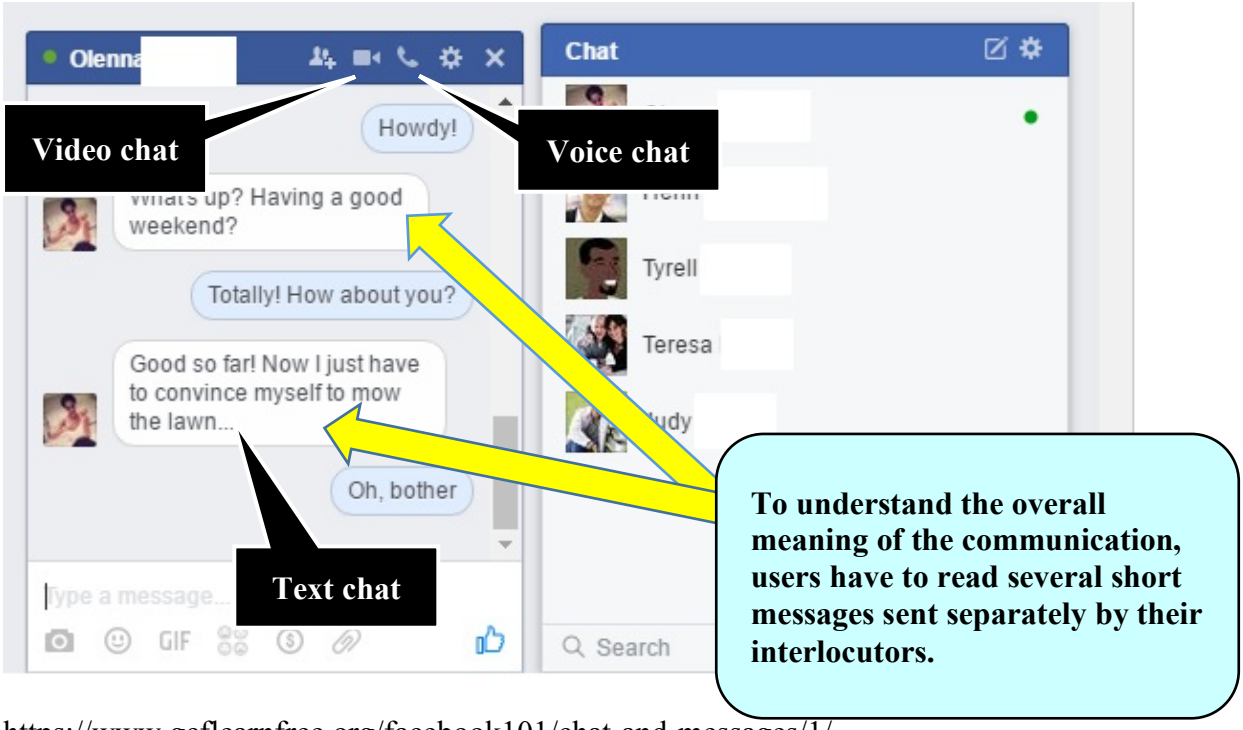
A telop created by Kassumi
観光する事の感じと住む事の経験は違いがありますね。
(What you feel while you are sightseeing and what you experience while you are living are different, aren't they?)

An example of the sentence reconstructed by the Japanese native speaker researcher
観光していて感じることと、住んでいて感じることは、違いますよね。
(What you feel while you are sightseeing and what you feel while you are living are different, aren't they?)

Image 7.29: Screenshot of telop created by Kasumi using Google Translate

5) Facebook chat

Facebook (https://www.facebook.com/) provides affordances to do text-chatting, voice chatting, video-chatting and to share documents (Image 7.30). Kasumi and Rita used the affordances as a surrogate of face-to-face interactions with Japanese native speakers living in Japan to receive language feedback to their script.



https://www.gcflearnfree.org/facebook101/chat-and-messages/1/

Image 7.30: Three chat functions in Facebook

Knowing Kasumi had only Japanese friends living in Japan, her peer (Sky) invited her to join his meeting with Japanese friends on campus to receive feedback to their script. Despite his invitation, Kasumi decided to receive feedback from her friend in Japan using Facebook chat due to her busy schedule.

Kasumi concerned whether she might have used 'weird (Japanese) words' or Japanese particle inappropriately. To improve accuracy in her Japanese script, Kasumi arranged to receive feedback by having a real time text chat with her friend in Japan. The Japanese friend

pointed out what was wrong (in her Japanese sentences) as well as paraphrasing her sentences using appropriate Japanese expressions. Kasumi reported during the semi-structured interview that the text-chat interactions helped her to learn "how to actually say (in Japanese)". In addition, the interactions with the friend who was not proficient in English provided Kasumi additional opportunities to use Japanese; clarifying her intended meaning using Japanese.

Despite the advantages of receiving feedback using Facebook chat, Kasumi also admitted some disadvantages; namely, the confusion associated with having to communicate with each other by reading several short messages sent separately by her Japanese friend (See mage 7.30). Kasumi also acknowledged that receiving feedback in a face-to-face dynamic would have been more effective as she could more easily clarify any feedback points she did not understand.

Rita also arranged a real-time text chat via Facebook with her Japanese friend living in Japan in order to receive Japanese feedback. She had to choose the approach because all her Japanese friends had returned to Japan after completing their short study-abroad programs at the university. Thus, the decision was primarily due to lack of access to Japanese native speakers in Australia. However, the text chat interactions encouraged Rita to use and learn Japanese in multiple ways. First of all, the text chat interactions provided Rita to clarify her intended meaning in her draft as her Japanese friend could not understand some of her erroneous Japanese. Excerpt 6 shows a part of Rita's interactions with Japanese friends using Facebook. As seen in the Excerpt, her Japanese friend required Rita to explain what she has meant by saying '交換した日本人' (Japanese who have exchanged). The confirmation question elicited an appropriate Japanese expression from Rita in Turn 2; '交換学生'(exchange students).

Excerpt 6

1. Japanese: What is ‘交換した日本人’ (Japanese who have exchanged)?

2. Rita: Exchange student. ‘交換学生’(exchange students) is better, right?

Incorporating suggestion from Rita’s Japanese friend, the pair (Rita/Rena) replaced ‘交換した日本人’ (Japanese who have exchanged) with the appropriate Japanese expression in their final draft; ‘交換留学生’(exchange students) (See below sentence).

A part of final draft written by Pair 7 (Rita/Rena)

日本人の**交換留学生**に聞いたところ、、だいたい日本のコーヒーはオーストラリアのコーヒーほど濃くはないそうです。

The erroneous expression (‘交換した日本人’(Japanese who have exchanged)) was replaced with the appropriate expression; ‘交換留学生’(exchange students)

Translation for the above sentence by the researcher

According to **Japanese exchange students**, ((I) have heard that) Japanese coffee is not strong as much as Australian ones.

The erroneous expression (‘交換した日本人’(Japanese who have exchanged)) was replaced with the appropriate expression; ‘交換留学生’(exchange students)

In particular, Rita highly evaluated re-readability of the Facebook text chat. Rita reported that re-reading her interactions with the Japanese friend helped her to understand why some of her sentences corrected by her Japanese friend sounded more natural as Japanese expressions. Like Kasumi and Rita, some language learners may not have any opportunities to have face-to-face interactions with a native speaker to receive feedback in their learning environment.

However, Kasumi and Rita demonstrated how active learners can resolve their resource constraints for language learning as agents of own learning; using an affordance of an online platform to access to the native speaker friends living in another country.

6) Textbooks

The participants perceived and acted on two kinds of affordances provided by Japanese textbooks; 1) to review Japanese grammar and vocabulary usage; and 2) to search for expressions to use in the digital story.

A less proficient learner, Tessie, used her Japanese textbook to confirm the Japanese grammar and vocabulary which she wished to use in her digital story but she was not confident to use. As mentioned earlier, she had suggested Yujin to write their own section independently at home. Due to the task division arrangement, Tessie had to resolve some of her language problems by consulting with her Japanese textbook. However, Tessie positively perceived the individual learning approach as she believed she can learn best when she conducts independent research. She asserted the benefit of resolving her language problems using textbooks by stating "It helps to have a deep impression of the grammar I have learned".

Po, an advanced learner of Japanese interpreted this project as an opportunity to consolidate his Japanese grammar to prepare himself for JLPT. Therefore, he decided to review Japanese grammar using his Japanese textbook. He also used it to explore any Japanese expressions he could adopt in his digital story. He commented during the semi-structured interview that the learning approach helped him to "intensify [his] memories (of Japanese grammars)". As Tessie and Po demonstrated, some learners use their school textbooks to meet their learning needs for this project. Acting on affordances of textbooks may extend their opportunities for learning Japanese beyond their classroom; reviewing and consolidating their grammatical knowledge they have learned in Japanese class.

7) Notebooks

Rita wanted to include some Japanese expressions in her digital story but she was not confident to do so. Therefore, she chose to confirm the usage by using her notes which she had recorded during lecture as a resource to review Japanese grammar. In particular, she reported to use the notes to confirm usage of 'AはBほど__ない'(A is not as much ___ as B). Image 7.31 shows a part of her note she used to confirm the expression. As Image 7.31 shows, Rita wrote down both meaning of the expression as well as the sample sentence in the notes.

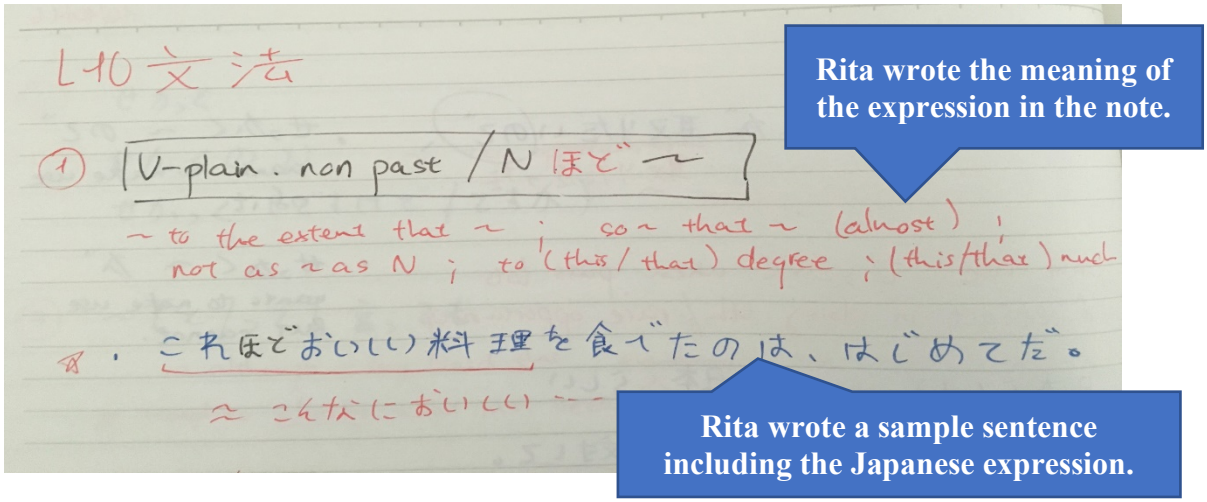


Image 7.31: Notebook entry used by Rita to confirm her grammatical usage

'AはBほど__ない'(A is not as much ___ as B) is the usage which Rita has explained to Rena confidently during revision stage. However, Rita got confused when Rena asked how to conjugate the expression with 'そうです(*sō desu*)'((I) have heard that, It seems that). 'そうです(*sō desu*)' which has two conjugation forms according to the meaning; 1) adjective/verb plain forms+'そうです(*sō desu*), noun + 'だ(*da*)'+ +'そうです(*sō desu*) to report what the speaker heard; and 2) adjective/verb stem + 'そうです(*sō desu*) to express judgement of the speaker. Confused by the conjugation rules, Rita suggested to use inappropriate conjugation

form; ‘強くなさそうです’((It) seems not strong) to state ‘日本のコーヒーはオーストラリアのコーヒーほど強くないそうです’((I) have heard that Japanese coffee is not strong as much as Australian one).

Realising own insufficient knowledge of the usage, Rita excised her ‘agency’ as an active learner; confirming the usage she is not confident to use by reviewing her lecture note after she returned home. Rita described the advantage of reviewing her notebook over the textbook by mentioning, “The explanation came from textbook, but the ‘*sensei*’ (teacher) added explanations (with) more details”. Reviewing notebooks enhanced Rita’s understanding of the Japanese expression she and Rena were struggle to use during revision session. As Rita demonstrated, active learners are aware of their roles as an agent of learner and takes their action to engage in learning; identifying own weakness as a learner and resolving the problem by using the relevant learning resources.

8) Audio recordings

The participants used an affordance of re-listenability provided by audio recordings to improve the pronunciation in their narration. In particular, they used two types of recording as a resource to improve their pronunciation; 1) the narration recorded by a proficient peer; and 2) the narration recorded by himself.

First type of recordings was used by Stephanie, a less proficient learner. Her proficient peer (Sherry) offered to practice Japanese narration together. However, Stephanie rejected her offer as she did not want take Sherry’s time. A self-efficient oriented learner, Stephanie, has learned Italian by listening to audio recordings made by the native speaker. To practice Japanese narration self-efficiently, Stephanie used the same strategy; asking Sherry to do a narrative recording of her section so that she could practice her narration in her own time. She practised her Japanese narration while listening to model recording completed by Sherry.

Stephanie elaborated the benefit of practicing Japanese narration by listening to Sherry's recordings as below:

> I could listen to the way that she pronounced things and the way that she used intonation and expression in her voice. I was able to get some good tips from that…, (such as) what pattern of emphasis it should have, and that's something I'm still learning.

Thus, Stephanie intentionally used audio recordings made by her proficient peer to practice Japanese narration using her preferred learning approach; practicing self-efficiently in her own time. The strategy allowed Stephanie to work on her narration self-efficiently by using Sherry's recording as the model.

The second type of recording, the narration recorded by himself, was used by Walter as a resource to identify his pronunciation errors and the areas he needed to improve. The challenge Walter has encountered during audio recording was to pronounce a chunk of noun and particle together. Walter who has just graduated from high school has not accustomed to narrating long Japanese passages, while Jiyoung has the extensive experiences at her university Japanese class; doing Japanese skit performances and shadowing Japanese recordings.

Walter's lack of Japanese narrating experiences was observed during recording stage. Walter was practicing and recording his narration by looking at his script in a mobile phone. Jiyoung played the back music so that Walter could practice his narration by visualising how his recordings sound (See Image 7.32).

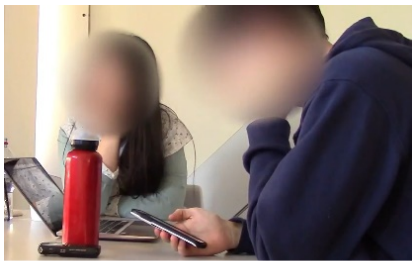


Image 7.32: Walter (right) is practicing and recording his narration with Jiyoung (left)

The following Excerpt 7 shows a part of his Japanese narration recorded while Walter was practicing and recording his narration. The section he paused was indicated with double 'slash', whereas particles pronounced separately was highlighted with grey.

Excerpt 7

Walter: (0:15) 例えば//外に出たら//どこに行っても//**他の言語**//**が**//聞こえます。

だから//どこの国から//来た人でも//差別されません。あなたも//**オーストラリア**//**に**//来たら//オーストラリア人です。

(For example//(if you) go out//wherever (you) go//(you) can hear//**different languages**. Therefore//wherever people are from//they are not discriminated. If you//come//**to**//**Australia**// (you) are an Australian.

As seen in the Excerpt, Walter narrated a chunk of noun and particle separately; 1) '**他の言語**//**が**//聞こえます'((you) can hear//**different languages**); and 2) 'あなたも//**オーストラリア**//**に**//来たら' (If you//come//**to**//**Australia**). Pointing out this problem to Walter, Jiyoung offered to add 'slashes' to his paper script so that he can identify where he should put pause to narrate his script smoothly.

For Walter, recording narration with accurate Japanese is an important condition to keep his audience attention to his digital story. He stressed importance of the accuracy by stating as below:

> When I see mistakes in video, I tend not to concentrate on the person who are making mistakes, what the person is saying. So I think it is bad that people do not focus on what I am saying, how I am saying or something wrong.

To narrate his script accurately, he decided to practice and re-record his narration at home using two resources; namely, his own recordings and a script Jiyoung had added slashes for him. Checking how he narrates using an affordances of the re-listenability, he completed his recordings for narration. In narration in his final work, Walter demonstrated to pronounce a chunk of noun and particle together; including '色々な言葉が//聞こえてきます'((You) can hear// various languages) and 'あなたも//オーストラリアに来たら//オーストラリア人です'(If you come to Australia, you are an Australian)[56].

As Stephanie and Walter demonstrated, how to interpret an affordance re-listenability is open to each learner. Learners perceive and act on the affordance differently according to their learning needs.

7.4.3 Social resources

To engage in language learning outside the sessions, the participants used four types of social resources to engage in learning Japanese outside collaborative dialogue with peers: 1) Japanese friends living in Japan; 2) Japanese native speakers in an online community; 3) Japanese friends on campus; and 4) the Japanese researcher.

1) Japanese friends living in Japan

Kasumi and Rita have encountered resource constraints during this project; lack of Japanese friends to receive feedback in face-to-face contexts. As a strategy to resolve their resource constraints and to receive Japanese feedback, they decided to use an alternative social resource; receiving feedback form Japanese friends in Japan via a real-time text chat. As discussed earlier in Facebook section, this strategy helped them to meet their learning needs;

[56] Walter's narration in final work can be retrieved at https://www.youtube.com/watch?time_continue=24&v=4H7c6MLfE1g (1:09-1:24)

receiving Japanese feedback and improving accuracy of their script despite their resource constraints.

2) Japanese native speakers in an online community, Lang-8

The problem Sherry has encountered during revision stage was lack of Japanese friends both in Australia and Japan. Although Sherry was advised by her peer partner, Stephanie, to receive feedback from Japanese native speakers, she did not know any Japanese who can provide feedback to her. As the compromise strategy, Sherry decided to use the alternative resource to receive Japanese feedback; receiving feedback from Japanese members in Lang-8 (http://lang-8.com/). Lang-8 is one of SNSs developed for language learners. The SNS provides services whereby users can receive feedback on their writing from native speakers for free, as well as socialise with the native speakers by leaving comments and sending personal messages (See Image 7.33)[57].

Image 7.33: Lang-8, used by Sherry to receive feedback from Japanese native speakers

[57] Lang-8 has temporarily suspended new registrations (January 18, 2018).

Sherry was aware of Lang-8 as a learning resource because her Japanese lecturer had uploaded the link onto the learning management system at her university. She started to use the SNS just prior to the commencement of this project. Sherry described Lang-8 as a community of people who are "very enthusiastic" to support other language learners, and who are "quite willing to answer, or check your mistakes for you" (see semi-structured interview with Sherry). Image 7.34 shows a screenshot of the Japanese script Sherry posted to Lang-8. As she commented, an 'enthusiastic' Japanese member not only corrected her sentences but also explained why the sentences were corrected in that way. The Japanese native speaker on Lang-8 also highlighted the important corrections using red letters (Image 7.34).

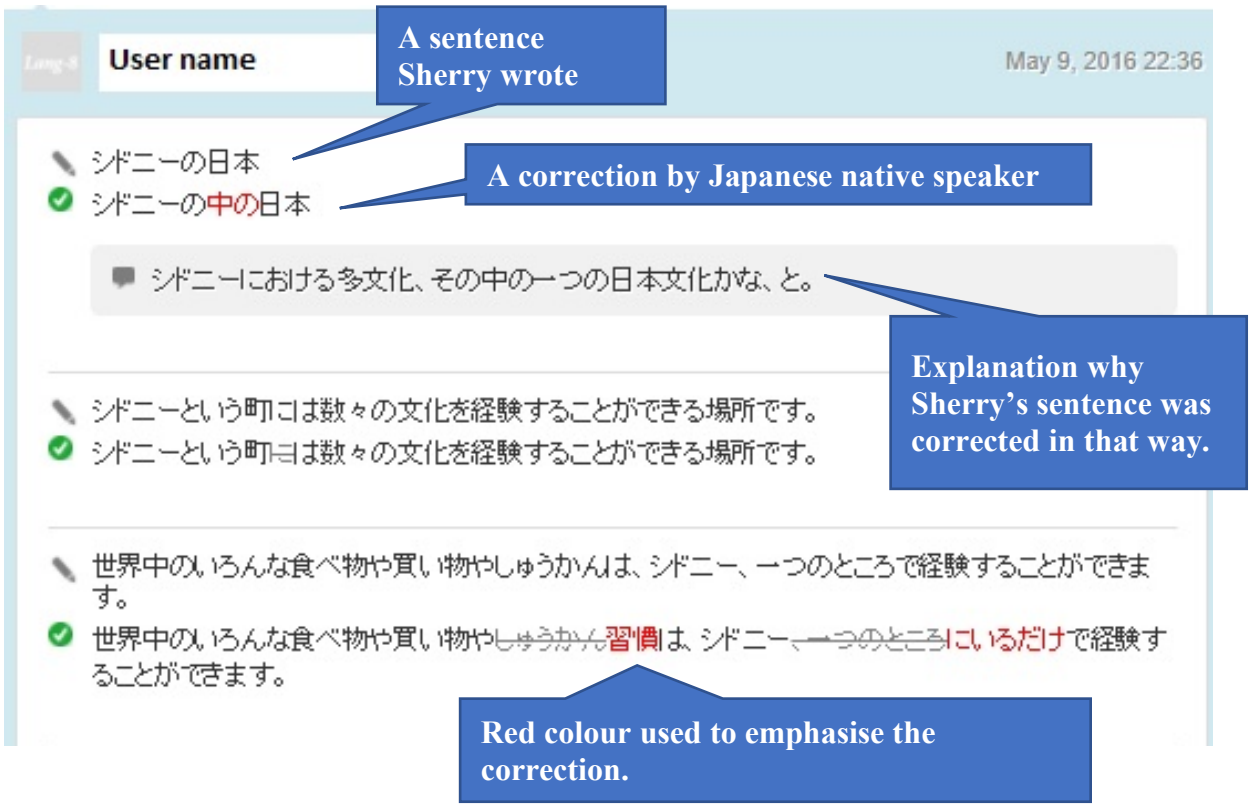


Image 7. 34: Screenshot of Lang-8 posted by Sherry

Researcher translation of the Japanese sentences uploaded to Lang-8 by Sherry

Title: Japan(nese culture) in Sydney

> **Comment from Japanese**
> (I corrected your sentence in this way) as (I thought you were trying to say) Japanese culture is just one of many cultures in Sydney.

1. Sydney is the place (you) can experience various cultures.

2. (You) can experience various foods, shopping and practices around the world in one place (Sydney).

The primary reason for Sherry's use of Lang-8 as a learning resources was to overcome her lack of Japanese friends who can provide Japanese corrections to her. However, Sherry perceived the affordance provided by Lang-8 for language learning positively as below:

> When I want to use specific expressions, but I don't know if they're right or wrong, they correct it for me, because it's obviously wrong, but I couldn't express it in any other way that I knew. With them just explaining it to me, that helped.

Sherry's desire to improve accuracy in her script encouraged her to receive Japanese feedback by resolving constraints in her learning environment; receiving feedback from Japanese native speakers using SNSs. The strategy use enabled her to identify her language errors as well as the appropriate Japanese expressions. Thus, active learners can transform their learning condition to the one they desire by using affordances provided by alternative resources.

3) Japanese friends on campus

Four participants (Brian, Po, Sky, Stephanie) used their Japanese friends on campus as affordances to meet four learning needs during this project; 1) to interview Japanese native speakers on their perspectives; 2) to learn appropriate Japanese expressions by receiving feedback; 3) to request to provide Japanese expressions; and 4) to speak in Japanese. The three

participants (Brian, Po, Sky) met their Japanese friends through student organisations for Australian and Japanese students at their universities. Prior to this project, Brian and Po socialised with the Japanese students as 'friends' in English; whereas Sky socialised with them as 'language exchange partners' using both English and Japanese.

First of all, Brian, Po and Sky interviewed their Japanese friends on campus by interpreting them as a resource to learn their perspectives as a Japanese. The interviews with Japanese helped them to learn how Japanese students perceived Australian university as well as life in Australia. Based on the interviews with Japanese friends, Sky described how his Japanese friend adjusted himself to life in a Australian life, whereas Brian and Po illustrated culture shock experienced by their Japanese students in Australia.

Secondly, Sky, Brian and Po used Japanese friends on campus as a resource to learn appropriate Japanese expressions by receiving feedback to their scripts. The three participants showed their script to their Japanese friends to receive feedback from a native speaker. In particular for Sky, sharing his script to his Japanese friend provided him opportunities negotiate his intended meaning and co-construct the Japanese expressions with her: He first simplified and clarified his intended meaning. His friend then helped to 'make his sentence natural as possible'. Prior to this project, he thought that he has 'practiced [his] Japanese (with his friends but he has not thought that he has) learned (Japanese) thought them'. However, this project provided him opportunities to experience a new affordance provided by his Japanese friends; learning appropriate Japanese expressions through them.

Thirdly, Stephanie perceived her Japanese friends on campus as an affordance to confirm Japanese expressions which she was not sure the usage. Therefore, she decided to ask them Japanese expressions she wanted to confirm. Stephanie reported during the semi-structured interview that the questions to Japanese friends further expanded her learning opportunities by

allowing she and her Japanese friends to discuss her writing style as well as aspects of Japanese culture.

Finally, Japanese friends on campus were also used as an affordance to speak in Japanese with Japanese friends by the participants. Use of the affordance was reported by Po who has interacted with his Japanese friends mainly in English prior to this project. Knowing Japanese friends are motivated to practise their English, Po has communicated with them mainly in English prior to this project. In turn, he felt "weird" about speaking in Japanese to them. Nonetheless, he commented that the task to interview Japanese native speakers created a legitimate context in which he could engage in learning Japanese with Japanese friends whom otherwise did not present such opportunities to him.

Thus, some participants may not have realised their Japanese friends on campus could serve as affordances to promote their language learning in informal learning contexts. However, collaborative learning projects may encourage them to perceive and act on affordances provided by their Japanese friends in order to meet a wide range learning needs.

4) Japanese researcher

The intention of the researcher to stay in the same physical location with the participants was to observe and examine their learning behavior. However, seven learners (Tessie, Stephanie, Po, Lucie, Yuki, Jiyoung, Rena), interpreted the Japanese researcher not only as the person was there to examine their learning behaviours but also as a linguistic resource to assist them to learn Japanese expressions. For example, Pair 5 (Lucie/Yuki) employed the researcher as a learning resource by actively asking me language-related questions during the sessions. Jiyoung also employed the researcher as a learning resource to improve her Japanese speaking proficiency by speaking Japanese to me during the session breaks and on the day we met for our interview.

Stephanie also used the researcher as a resource to improve her Japanese. When I talked to Stephanie during the break, I used simple Japanese or English due to her limited Japanese language proficiency and her preference to respond to my questions in English. Stephanie also used my conversations with Sherry (her peer partner) as a language learning resource. I would talk to Sherry, an advance learner of Japanese, in the way I would talk to other Japanese native speakers. Despite her lack of Japanese language to participate in our conversation, Stephanie nonetheless used the conversation as a resource to expose herself to Japanese beyond her proficiency level. Regarding the benefits, Stephanie commented during a semi-structured interview as below:

> Listening to you [the researcher] and [Shelley] conversing in a more fluent way, it really was a big opportunity for me to challenge myself to follow the conversation. Also, it's a little bit of an aspiration, I think so. That is how someone, you know, two levels higher than me (in our university Japanese program) is able to converse (in this level). Maybe in one year's time I will be able to converse like this… I think, from the time that we first met to now, I think my Japanese has improved. I'm more comfortable speaking Japanese now, I think.

As Stephanie demonstrated, active learners excerise their agency to construct opportunities for language learning even in the contexts where their interlocutor (the Japanese researcher) did not have any intension to serve as a resource to promote their language learning. Such their creative interpretation of the resource provided them different kinds of opportunities for language learning which they could access in peer-to-peer interactions.

7.4.4 Summary of language learning outside collaborative dialogue

This section explored how the participants engaged in learning Japanese outside collaborative dialogue with peers by analysing the use of three resource types; discursive resources, material resources, and social resources. Figure 7.3 summarised how each resource was used by the participants either while they were engaging in individual learning in the presence of peers or outside the sessions.

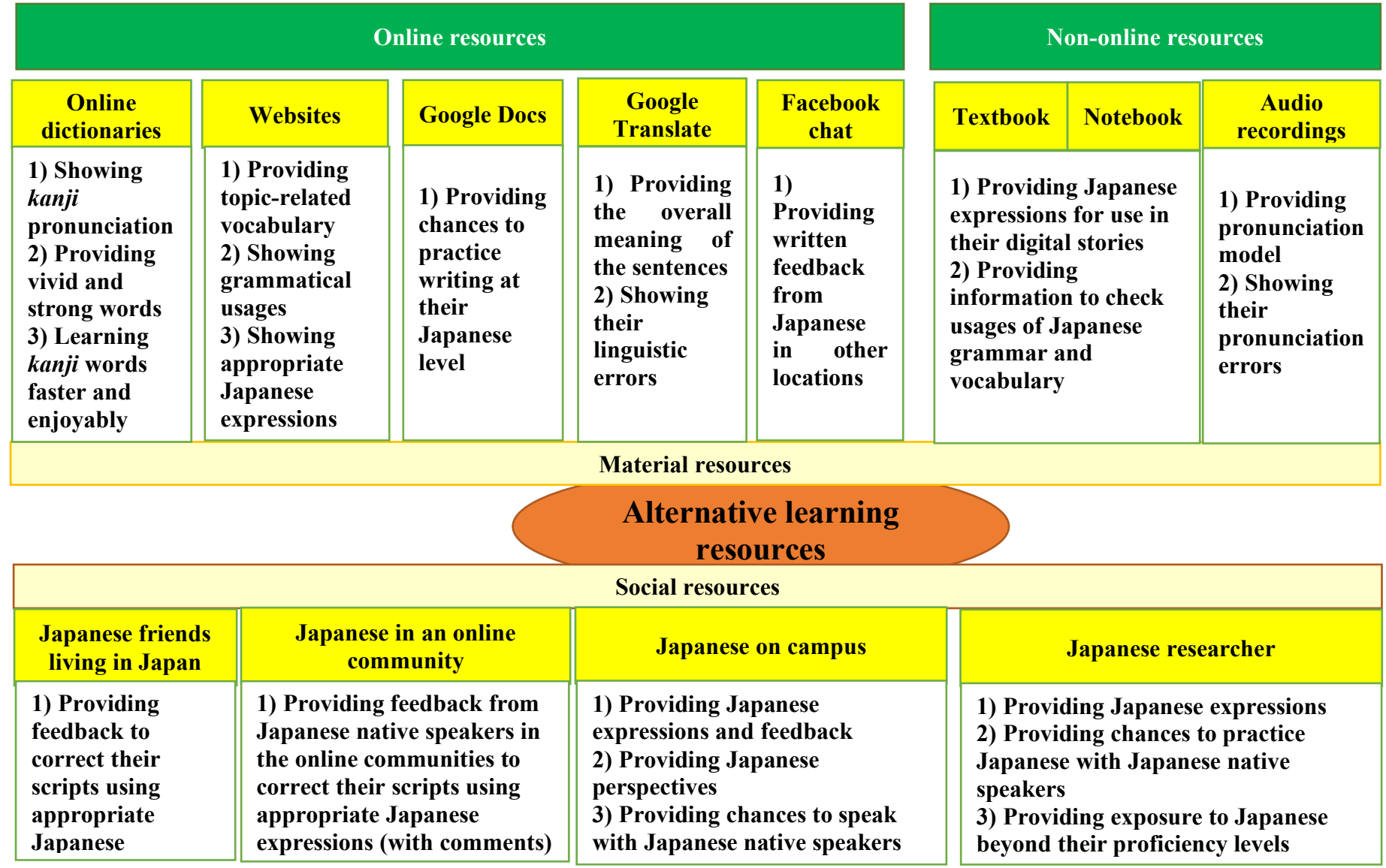


Figure 7.3: Roles of alternative resources in promoting language learning

As seen in Figure 7.3, the participants used multiple resources to meet their needs for language learning outside collaborative dialogue. What is worthwhile to note in Figure 7.3 is the same resource was used to meet different learning needs. In other words, a resource provides multiple possibilities of how each learner can perceive and act on it to meet their own learning needs. They chose to act on the affordances which were relevant and effective to meet own learning needs as agents of their own learning. Use of these resources outside collaborative dialogue with peers provides them different kinds of opportunities for language learning which they access in collaborative dialogue with peers; such as receiving language feedback from the native speakers as well as learning Japanese perspectives by interviewing Japanese students. Figure 7.4 shows impact of using online resources on language learning outside collaborative dialogue with peers. As Figure 7.4 shows, strategic use of these resources outside collaborative dialogue can expand their opportunities for language learning beyond collaborative dialogue with their peers.

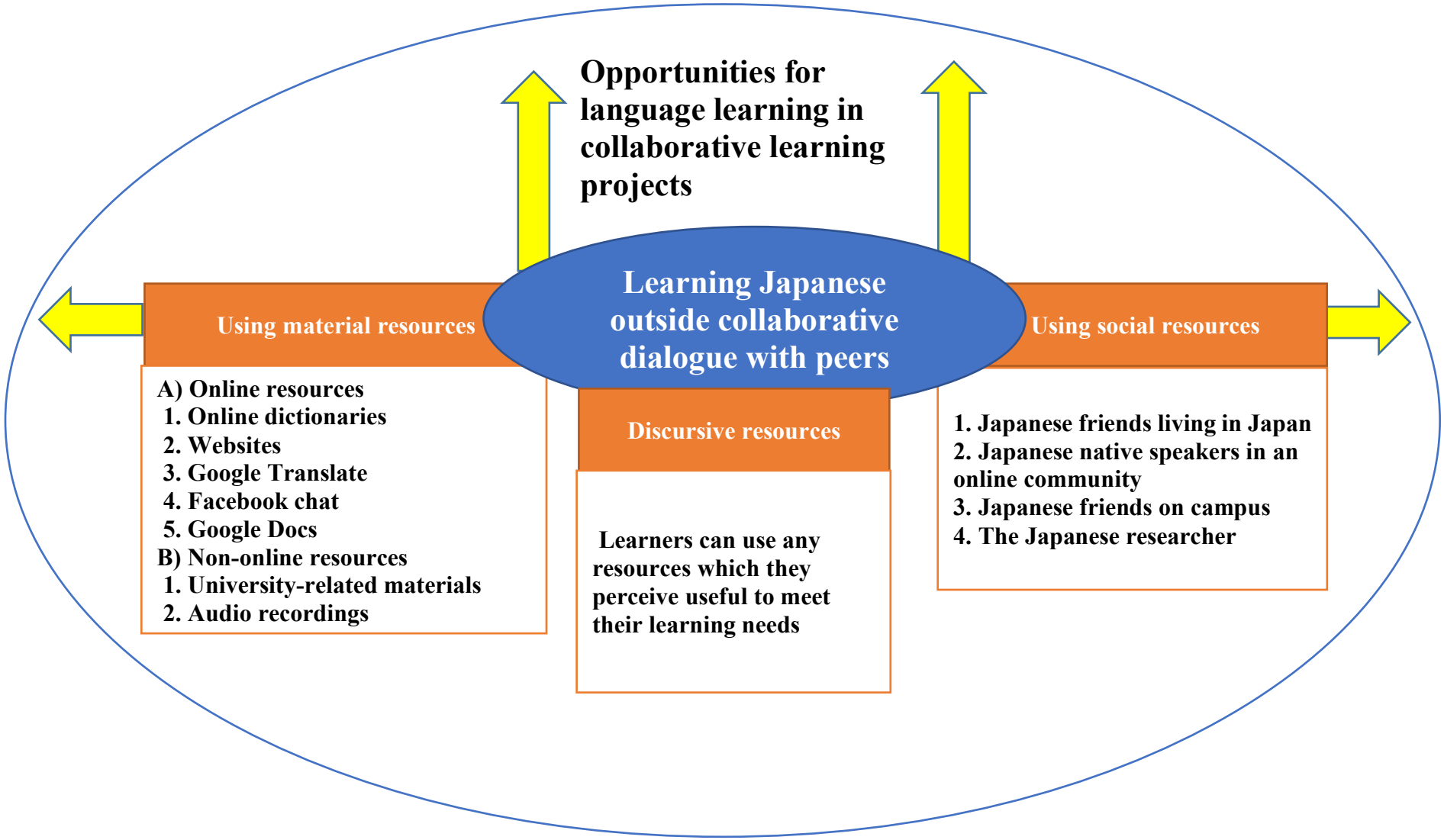


Figure 7.4: Impact of using resources on language learning outside collaborative dialogue with peers

7.5 Conclusion

This chapter explored how the seven participant pairs engaged in learning Japanese inside and outside collaborative dialogue with peers by focusing on their resource use. Previous studies of short-term collaborative learning tasks examined the process of language learning undertaken by the participants under the condition where learners engage in collaborative dialogue; constructing knowledge of Japanese by pooling their linguistic knowledge with peers (e.g., Parks, 2015; Storch, 2002; Watanabe & Swain, 2007). To date, very few studies examined how learners used online resources to engage in language learning when they work on collaborative learning tasks with peers (Hsieh, 2015, 2017). To fulfil the research gap, this chapter explored how use of use of resources other than their own linguistic knowledge, can support language learning during long-term collaborative learning projects.

This study found that the participants engaged in learning Japanese in multiple learning contexts by using online resources; inside and outside collaborative dialogue with peers. Figure 7.5 summarises how they used online resources to enhance language learning during collaborative dialogue with their peers. The roles of online resources in promoting language learning during collaborative dialogue can be classified into two types; 1) providing linguistic information which their peers did not or cannot provide; and 2) encouraging pairs to take a cooperative approach to interact with each other in order to resolve language problems together.

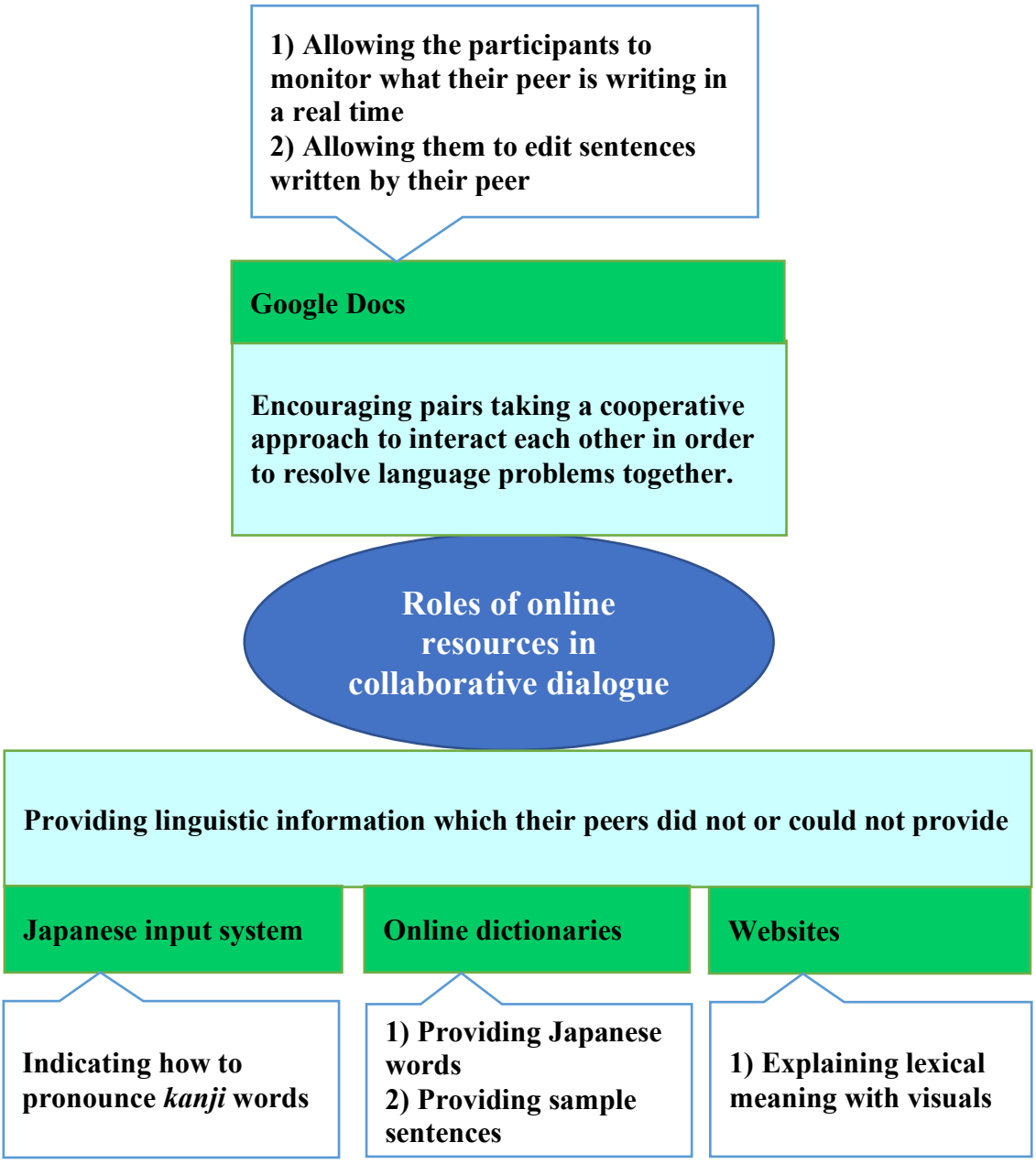


Figure 7.5: Roles of online resources in promoting language learning during collaborative dialogue

First of all, using Google Docs in a writing task encouraged Pair 4 (Brian/Po) to interact with each other to resolve their language problems together despite their task division; writing different lines synchronously. Division of tasks in cloud based collaborative writing is also reported by Tan et al. (2010). However, what distinguished Pair 4 from the participants in Tan et al. (2010) is their on-going task allocation as their task progress, and active interactions with peers to resolve their language problems together. Participants in Tan et al. (2010) developed 'cooperative pattern' as each learner focused on different sentences while working together. The authors also reported that pairs showing 'cooperative pattern' did not show much occasions of knowledge co-construction with peers. On the other hand, Pair 4 intentionally allocated few lines as they completed their previous lines by using affordances of Google Docs; functions for a real time monitoring and editing function by the multiple users. In addition, the pair also used the affordances to interrupt each other in order to discuss their language problems. Using the affordances, the pair provided feedback or corrected peers' error while their task was still progress. Their strategic use of Google Docs highlighted benefits of using Google Docs in collaborative learning projects; pairs working by taking a cooperative approach can still work together to resolve their language problems using the affordances provided by Google Docs.

Secondly, online resources were also used to obtain linguistic information which peers did not or could not provide in collaborative dialogue. For example, online dictionaries were used to locate Japanese words and sample sentences which their peers did not or could not provide. Visual images in websites were also used to understand the lexical meaning in depth. The findings suggested that using online resources during collaborative dialogue provides different kinds of linguistic information they can obtain from collaborative dialogue with peers.

Another important finding discussed in this chapter was that the participants working on long-term collaborative learning projects engaged in learning Japanese not only during collaborative dialogue with their peers but also in multiple learning contexts outside the dialogue. Some participants engaged in language learning individually using resources which are other than their linguistic knowledge while their peers were working on other parts of their tasks. Other participants constructed opportunities for language learning outside the sessions by using alternative resources. Figure 7.6 indicates how use of alternative resources encouraged the participants to engage in learning Japanese outside the sessions. As Figure 7.6 shows, it shows that alternative resources played three important roles; 1) encouraging learners to interact with Japanese using Japanese; 2) connecting learners to Japanese living in other locations; and 3) encouraging learners to learn Japanese self-efficiently.

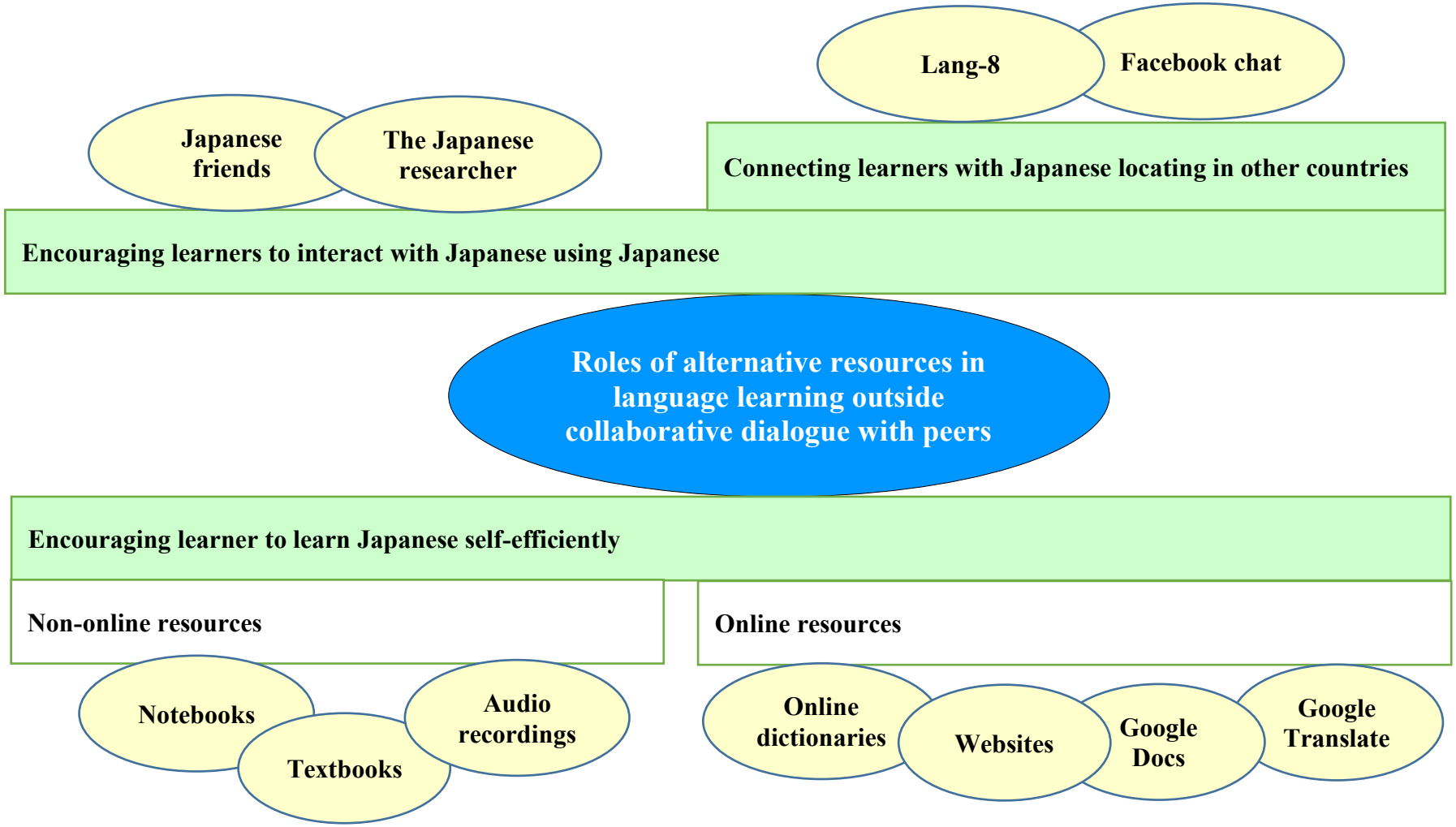


Figure 7.6: Roles of alternative resources in language learning outside the sessions

Firstly, Japanese friends and the researcher were used as a resource to interact with using Japanese. Interestingly, some participants did not perceive their Japanese friends as a learning resource for Japanese. For example, Po decided to communicate mainly in English to help his Japanese friends practice English. Sky did not expect he could learn Japanese through his Japanese language exchange friends although he had chances to speak in Japanese as a language exchange partner. Thus, integrating interactions with Japanese friends in collaborative projects may provide them opportunities to experience the affordances to learn their target language and their perspectives.

Secondly, online resources such as Facebook chat and Lang-8 connected the participants who did not have any Japanese friends in Australia to Japanese native speakers in located in other places. For example, Rita, Kasumi and Sherry have experienced a resource constraint; lack of Japanese network to receive Japanese feedback to improve their Japanese script. However, the participants overcame their resource constraints by using affordances of online resources; Facebook chat and Lang-8. Their strategic use of these online resources demonstrated that affordances of online resources may empower language learners encountering resource constraints in their physical learning environment; accessing learning resources available in online to meet their learning needs.

Thirdly, alternative resources were used to support learning Japanese self-efficiency outside collaborative dialogue with peers. Non-online resources such as textbooks and notebooks were used to review Japanese expressions by themselves in the contexts where their either peers or Japanese native speakers were available. Online resources such as online dictionaries, websites and Google Translate helped learners to resolve their language problems self-efficiently. Google Docs was used to participate in a writing task which is beyond the learner' Japanese proficiency level as a self-efficient learner. Thus, the findings suggested that using affordances of alternative resources enable less proficient learners to learn their target

language self-efficiently to some extent; resolving language problems by using online resources.

Thus, using alternative and multimodal resources provides the participants multiple possibilities to use and learn their target language during this project. Use of these affordances engaged learners in learner-centered learning; learning what they want to learn using resources relevant to their learning needs and goals. Despite the benefits of using alternative resources, educators in some learning contexts require learners to resolve their language problems either by using their own linguistic knowledge or by sharing that of peers. Such learning approach may discourage them to take advantage of affordances provided by these resources to enhance their language learning during long-term collaborative projects. For example, Yuki frequently consulted with online dictionaries to find 'vivid words' in Japanese while writing her script individually during the writing session. For Yuki, online dictionaries were crucial resources to locate 'vivid' words to arouse strong emotions in her audience, and to help them to remember her story. Yuki's peer partner, Lucie, could not provide such Japanese words despite her advanced level of Japanese. Yuki commented in a semi-structured interview how she would write her Japanese script under a hypothetical learning environment where she cannot use online dictionaries:

> Without (using an online) dictionary, I will think of a simple way to say it. If I can't think of a way, I'll ask [Lucie] what's a simple way to say it and then we'll just use the words that we know.

In some learning contexts, learners are expected to engage in learning by themselves or with peers using only their linguistic knowledge. Such learning contexts may diminish the opportunities they have to engage in language learning in multiple ways, the expressions they use in the target language, and what they can achieve during the tasks/projects.

Thus, this chapter highlighted for readers the importance of encouraging language learners to explore the use of alternative resources to engage in language learning more effectively according to their preferred learning styles and their learning objectives. Based on the findings reported and discussed in Chapters 5-7, Chapter 8 will discuss factors mediating how the participants engaged in language learning during this project.

Chapter 8

Factors mediating language learning in collaborative digital storytelling projects

8.1 Introduction

The findings discussed in Chapters 5 through 7 show that the seven pairs of Japanese language learners engaged in learning Japanese in multiple ways during the collaborative digital storytelling project. As discussed in Chapters 5 and 6, each pair discussed LREs with peers to different extents to engage in language learning. The findings reported in Chapter 7 showed that some participants engaged in language learning individually using online resources, with their peers present in the same learning environment. This findings raised a important pedagogical question; What factors encouraged the participants to engage in learning Japanese in multiple ways even though they participated in the same project?

To address this research question, this chapter examines the factors mediating the language learning undertaken by the seven pairs during the project. Of interest are: 1) the factors encouraging and discouraging them to discuss LREs with peers to engage in language learning; and 2) the factors encouraging some participants to engage in language learning individually using online resources despite the presence of a peer in the same physical learning space. The factors mediating their language learning were analysed by drawing on Activity Theory (Engeström, 1987, 1996, 1999, 2001), the concept of 'contradiction' (Engeström, 1987, 1996, 2001), and interacting activity systems with a three-layered learning environment model developed for this study. Details of the analytical method are discussed in Section 8.1.1.

Section 8.2 compares the factors encouraging and discouraging the seven pairs to discuss LREs with their peers to resolve their language problems for language learning. To help readers to understand how these factors interacted to encourage or discourage each pair to discuss LREs with peers for language learning, Section 8.3 compares the activity systems developed by Pairs 6 and 7[58]. Both sets of peer-groups worked on the same part of their task, but discussed LREs to different extents. Section 8.4 discusses the factors which encouraged Pairs 1, 3, and 4 to engage in language learning individually by positioning them into three learning contexts: 1) valuing similar learning approaches, 2) experiencing inner contradictions; and 3) experiencing both inner and secondary contradictions. This chapter concludes by highlighting the interaction dynamics including the multiple factors to mediate how each pair engaged in language learning. The benefits of individual language learning using online resources from the perspectives of the less proficient language learners is also discussed.

8.1.1 Analytical procedures

Chapter 8 aims to answer Research Question 4; What factors mediate how the seven pairs engaged in language learning during collaborative digital storytelling projects. The data used for the analysis was collected via video recordings of the participant pairs as they created their digital stories and via semi-structured interviews and stimulated recall sessions with the participants regarding their learning behaviors during the sessions. The following four-step coding procedure was used to analyse the data: 1) open-coding; 2) matching open-coding nodes with activity systems; 3) matrix coding; and 4) drawing interacting activity systems and the mediating factors for each pair.

[58] The first half of Japanese script by Pair 7 (Rena/Rita) was completed by Rena alone before the writing session had started. However, the pair completed the latter half of their script by working on the same part of their task.

First coding procedure

The first coding procedure was conducted to identify the factors mediating the way that each participant engaged in language learning during the three production stages: story development, writing a script, and modifying their script. For the analysis, transcriptions of the semi-structured interviews and stimulated recall sessions were carefully read to identify the segments in which they described their learning behavior during the three production stages. Their comments included their beliefs about collaborative learning, the reasons for initiating LREs, suggestions to use Google Docs for writing and resolving language problems using online resources. The participants' comments were also compared with the relevant segments from the video recordings recorded during the sessions. The segments were then open-coded to summarise the factors commented on by the participants and the nodes were classified as either 'factors encouraging the participants to discuss LREs with peers' or 'factors discouraging them to discuss LREs'. Table 8.1 shows a sample of the coding results to emerge from the first coding procedure.

Table 8.1: Examples of the coding categories to emerge from the first coding procedure

Factors encouraging participants to discuss LREs with peers	**Factors discouraging participants to discuss LREs with peers**
1) Realising limitations of learning Japanese using online resources alone 2) Sense of self-efficacy 3) Perceiving peers as learning resources	1) (Online resources) provide quick responses 2) Preference to learn individually 3) Rejecting peers as learning resources

Second coding procedure

The second coding procedure was to match each node to emerge from the first open-coding procedure with the seven nodes created according to the six components of a human activity system (1. mediating artefacts; 2. subject; 3. object; 4. rules; 5. community; 6. division of labour) and the 'outcome' (Engeström, 1987, 1996, 1999, 2001). Two subcategories were further created for each of the seven nodes: 1) 'factors encouraging discussion of LREs'; or 2) 'factors discouraging discussion of LREs'. After reading the segments of each node to emerge from the first coding procedure, the node was then moved to the relevant node from the human activity system. Image 8.1 shows a sample of the coding results to emerge from the second coding procedure. As seen in the image, the nodes relevant to 'rules' and 'factors encouraging discussion of LREs' were allocated to '1'; whereas nodes relevant to 'rules' and 'factors discouraging discussion of LREs' were allocated to '2'.

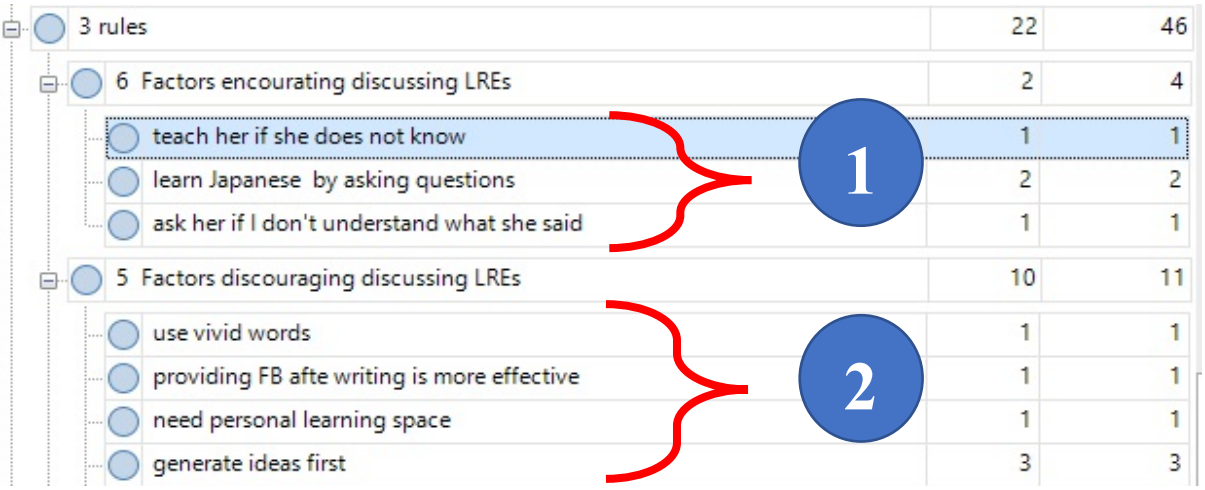


Image 8.1: An example of the coding results after coding procedure 2

Third coding procedure

The third coding procedure was conducted to identify the factors mediating how each pair engaged in language learning during the project. To complete the analytical procedure, a Table was first created showing the seven nodes of a human activity system (Engeström, 1987, 1996, 1999, 2001) per each pair using the 'matrix coding' function. Image 8.2 shows an example of a Table created for Pair 1 (Tessie/Yujin) using the function. As seen in the Image, the Table shows the number of nodes coded according to the seven categories of a human activity system. To understand the mediating factors for each learner in the pair, the segments per coding category were first indicated by clicking the number in the Table. The segments per coding category were then carefully read for each learner by clicking the number in the Table.

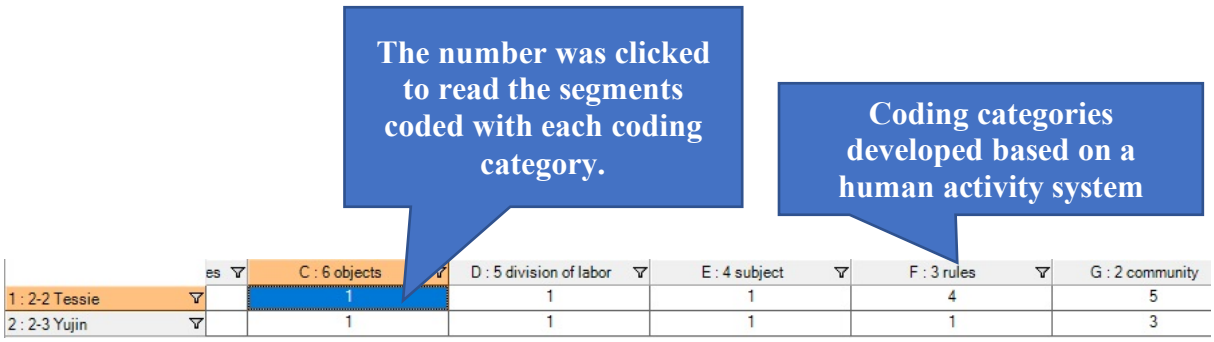


Image 8.2: Table showing the mediating factors generated by the 'matrix coding query'

Fourth coding procedure

The fourth coding procedure involved visually representing the factors mediating language learning per pair using the 'interacting activity systems with a three-layered environment model'. For the procedure, the segments per coding category of the mediating factors were read carefully using the same method described for the third coding procedure. The mediating factors were then indicated using the model by matching each factor with the six components of a human activity system and within the learning environment to which the

factor belonged. After completing the draws of the activity systems for the seven pairs, the mediating factors of language learning were compared with the ones of his or her peer, and with other pairs to identify the patterns of their activity systems. In this stage, the model was also analysed to identify the 'contradictions' within each activity system and between the peer's activity system by carefully comparing the mediating factors in the model.

8.2 Factors which encouraged or discouraged discussions of LREs for language learning

As discussed in Chapters 5 and 6, the seven pairs discussed different amounts of LREs to engage in language learning with peers; ranging from 4 LREs (Pair 7) to 93 LREs (Pair 6). The participants provided different accounts for the factors during the semi-structured interviews and stimulated recall sessions. This section compares the factors which encouraged or discouraged discussion of LREs with peers drawing on the six components of a human activity system (Engeström, 1987, 1996, 1999, 2001): 1) subject; 2) mediating artefacts; 3) objects; 4) rules; 5) communities; and 6) division of labour, and the 'outcome'.

Figure 8.1 summarises the major factors mediating LRE discussions with peers during the project. The factors most frequently commented on by the participants per each component of the human activity system is provided. The left triangular in Figure 8.1 shows the major factors which encouraged the participants to actively discuss LREs with their peers. The most common factors identified by the participants were: 1) Subject: sense of self efficacy as a language learner; 2) 'Objects: improving speaking proficiency; 3) Mediating artefacts; realising limitations to learn Japanese from online resources; 4) Rules: learning by asking questions; and 5) Community: perceptions of peers as learning resources.

The right triangular in Figure 8.1 shows the major factors which discouraged participants from discussing LREs with their peers for language learning. These mediating factors include: 1) Subject: preference for individual learning; 2) Object: creating digital stories in Japanese; 3) Mediating artefacts; realising greater advantages from consulting with online resources; 4) Rules: generating ideas first; 5) Community: negative perceptions of peers as learning resources; and 6) Division of labour; preoccupied with other tasks due to the division of the task. This section compares the factors encouraging or discouraging the seven pairs to discuss LREs for language learning per each component of a human activity system.

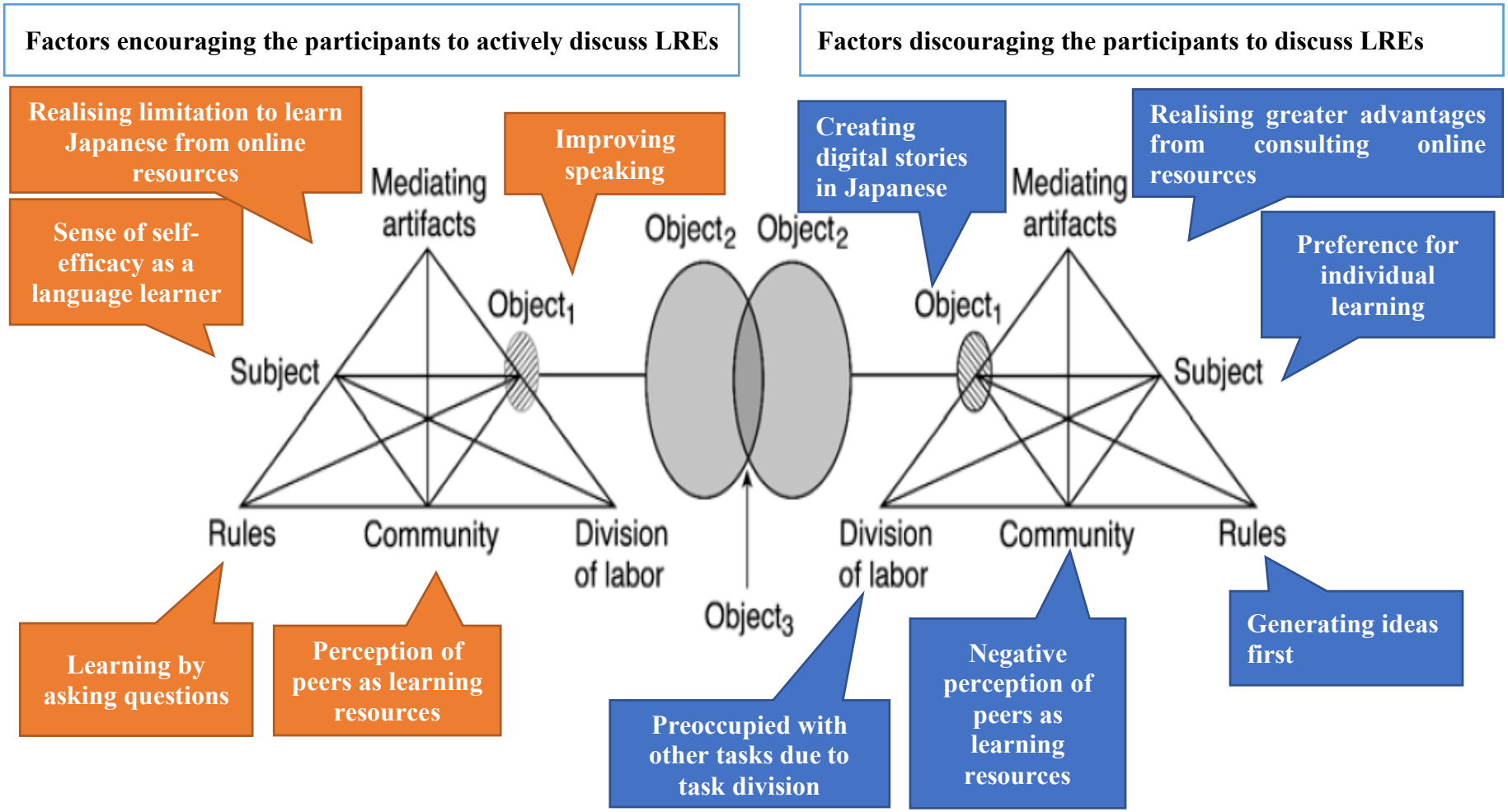


Figure 8.1: Major factors impacting interactions for language learning

8.2.1 Subject: Sense of self-efficacy vs preference for individual learning

First, the participants [Subjects] themselves provided the factors which either encouraged or discouraged active discussion of LREs to engage in language learning. A subject-related factor which motivated the participants to discuss LREs for language learning was 'a sense of self-efficacy'. This factor was provided by Walter (Pair 6) only, who discussed LREs with his peer, Jiyoung, the most frequently among the seven pairs to engage in language learning (see Section 5.3, Appendix 17). Given his advanced Japanese language proficiency, Walter could have constructed Japanese sentences without difficulty using simple grammar and vocabulary he could easily recall. However, he chose to extend his Japanese language knowledge by constructing sentences in Japanese using grammar and vocabulary he could not recall by himself; that is, he needed to consult with Jiyoung by discussing LREs. Walter provided 'sense of self-efficacy' as a language learner as the factor for his active engagement in discussing LREs with Jiyoung by proudly stating, "Because I believe I can do it".

While 'a sense of self-efficacy' encouraged the Walter to actively discuss LREs to construct Japanese sentences beyond his Japanese level, the subject's preference for individual learning led other participants to resolve their language problems by consulting with online resources rather than discussing LREs with peers. This factor was provided by two participants, Lucie (Pair 5) and Rena (Pair 7), who frequently consulted online resources to resolve their language problems. Lucie stated that the reason she adopted such a learning approach was her desire to have her "own personal space to learn". For Rena, the reason was that it added to the efficiency of individual learning, stating during the semi-structured interview; "I am more like individually competent".

8.2.2 Object: Improving speaking proficiency vs. creating digital stories in Japanese

Second, the types of learning objects developed by each participant at the beginning of the project encouraged or discouraged them to discuss LREs with peers as well as to speak in Japanese. The main object-related factor which encouraged participants to discuss LREs with peers was to 'improve Japanese speaking proficiency'. This factor was provided by five participants (Jiyoung, Po, Rena, Yujin, and Yuki). For example, Po (Pair 4) decided to improve his Japanese speaking proficiency by participating in this project. To improve his speaking skills during the project, Po indicated at the beginning of the project that he intended to speak Japanese as much as possible. According to Po, he discussed the story structure with Brian mainly in Japanese. During the project, Po did not often initiate LREs to resolve his LREs in his lines. However, discussions about story development with Brian primarily in Japanese and the writing task itself created contexts where Po needed to discuss LREs with Brian for two reasons: 1) to confirm the meaning of the Japanese words used by Brian that Po did not know; and 2) to understand what Brian intended to mean when using erroneous Japanese expressions. In other words, Po's object to improve his Japanese speaking proficiency and his interactions with Brian provided him with opportunities to extend and consolidate his Japanese knowledge by discussing LREs with Brian.

The learning object of Yuki was to *"*learn how to speak about [her] personal experiences" using "proper terms" in Japanese. Yuki explained that the best way to achieve her learning object was to "check (Japanese expressions) with a Japanese person and ask" at the beginning of the project. Adhering to her plan, Yuki would confirm the appropriateness of the Japanese expressions she had constructed using online dictionaries with both the researcher and her peer, Lucie. Thus, her motivation to use proper terms in Japanese encouraged her to discuss LREs with the researcher and Lucie.

On the other hand, some participants developed general objects rather than objects focused on language learning. The major non-language learning object was to 'create digital stories in Japanese'. This object was mentioned four times by three participants (Sky, Kasumi and Lucie). For example, the object Sky aimed to achieve in the project was to "get experience by making (a) Japanese-related video". Aspiring to find employment in video game industry, Sky was motivated to present the digital story he produced during the project in his 'portfolio' when applying for employment. Majoring in Media and Production, Lucie aimed to create a digital story that "challenges our visual in a way and visual storytelling skills and (to) integrate Japanese". These comments suggested that some participants were motivated to achieve non-language learning related objects; whereas other participants developed objects that drove them to learn Japanese by actively discussing LREs with peers.

8.2.3 Mediating artefacts: Perceiving limitations or advantages of online resources

The participants' perceptions of the mediating artefacts also impacted how they resolved their language problems; either by discussing LREs with peers or consulting online resources. Although the participants resolved their language problems to some extent using online resources, some participants were still motivated to consult with their peers about Japanese-related questions due to their perceptions of the limitations of online resources use for language learning. Tessie commented on this factor four times; whereas Brian and Yuki commented once. For example, a less proficient peer, Tessie, first tried to resolve her language problems using Google Translator rather than asking her peer, Yujin. However, Tessie started to ask language-related questions to Yujin after she realised the Google approach led her to make many language mistakes.

For Brian, a high-intermediate learner, the limitations around resolving language problems using online resources related to their inability to provide appropriate Japanese expressions frequently used by the native speakers. He explained why it was more advantageous to ask his peer for the Japanese expressions rather than consulting with online dictionaries as below:

> I guess [Po] seems to rely on what sounds more natural (as Japanese). You can always get machine translation, but they are never good as actually gaining (feedback) from someone who has some experiences in Japanese.

As an advanced learner, Yuki frequently resolved her language problems by consulting online dictionaries. However, her perceived limitations of the online dictionaries; namely, their inability to provide Japanese expressions that consider her project contexts, still encouraged her to consult with her peer, Lucie, about Japanese expressions. Yuki described the benefits of consulting with Lucie about her language problems as below:

> Because [Lucie] knows about the project, like she knows what I'm doing. Sometimes a dictionary can't look at the whole situation to answer my questions.

While the perceived limitations of online dictionaries encouraged some participants to discuss LREs with peers, the perceived advantages of using online resources discouraged other participants to do so. Six participants (Brian, Lucie, Po, Rena, Tessie, and Yuki) commented on this factor 19 times. For examples, access to a quick response from online resources encouraged Po (Pair 4) and Rena (Pair 7) to resolve their language problems using Google, even though their peers were in the same learning space. In addition, Lucie (Pair 5) reported several advantages from using online resources rather than discussing LREs with Yuki, including: 1) providing difficult or elegant words; 2) showing how the word is used in a sentence; and 3) learning *kanji* words in an enjoyable way.

8.2.4 Rules: Learning by asking questions vs. generating ideas first

The participants developed rules for language learning which also encouraged or discouraged them to discuss LREs with peers. The main rule-related factor which encouraged active discussion of LREs was to 'learn by asking questions'. This rule was described twice only by Walter who discussed the largest number of LREs with his peer, Jiyoung (see details in Section 5.3, and Appendix 17). Walter asserted the importance of Japanese language learners asking language questions to peers by stating; "If I want to know something or if I felt something went wrong, you have to find out. You gonna ask questions".

Although the rule to 'learn by asking questions' motivated Walter to discuss LREs with his peer, the rule to 'generate ideas first' discouraged other participants from discussing LREs for language learning. This rule was mentioned three times by Sky (Pair 2) and Brian (Pair 4). For example, Sky tried not to discuss the task procedures in Japanese or to ask Japanese-related questions to his peer, Kasumi, except during the 16 minutes the pair were allocated to provide feedback on their Japanese script. Sky explained her reasoning by stating; "Because we tried to complete our task as efficiently as possible". On the other hand, although Brian developed his story with Po using mainly Japanese, when they discussed writing their script they spoke mainly in English. Due to their language choice, Brian encountered difficulties when trying to express his ideas in Japanese while discussing their story development with Po. He could have used these occasions as an opportunity for language learning either by searching for the Japanese words on the Internet or by asking Po. However, he chose to code-switch to English to complete their on-going discussion. He described the reason for code-switching by stating; "I tried to list ideas as much as possible. So rather than using this bit of time for nothing. I just wanted to get all ideas".

8.2.5 Community: Perceiving peers as learning resources vs. rejecting peers as a learning resource

Peer participants working in the same learning community also mediated whether they discuss LREs to engage in language learning. The community-related factor which most encouraged the participants to discuss LREs was 'perceptions of peers as learning resources'. This factor was mentioned by eight participants 15 times. The participants identified different peer strengths as learning resources such as 'Japanese-origin words the peer learned in informal learning contexts' (Jiyoung), 'different formality of Japanese words' (Walter), 'knowledge of Japanese expressions commonly used by the native speakers and *kanji* words' (Brian), and 'rich lexical knowledge' (Lucie).

While 'perceptions of peers as learning resources' encouraged some participants to discuss LREs with peers, 'negative perceptions of peers as learning resources' discouraged one participant, Rena (Pair 7), from discussing LREs with peers to engage in language learning. Rena discussed the least number of LREs with her peer among the seven pairs (see Section 5.3 in Chapter 5, Appendix 17). During the project, Rena initiated discussion of only two LREs with Rita. Rena commented that one of the reasons for this was that she did not trust Rita's knowledge of Japanese grammar, *kanji* words, and lexical knowledge as resource for learning Japanese.

8.2.6 Summary of the mediating factors

This section compared the factors which encouraged or discouraged the participants to discuss LREs with their peer to engage in language learning during the project. Analysis of their accounts revealed that language learning by discussing LREs with peers was mediated by multiple factors rather than personal factors only. Participant language learning by discussing LREs with peers was also mediated by the learning tools they used and social factors such as

the rules they developed to work on the project, the communities in which they were/have been situated, and how they divided their tasks and roles. Thus, the findings suggested the importance of analysing the factors mediating language learning during long-term collaborative learning tasks from a broader perspective; that is, analysing the personal, contextual and social dimension factors.

8.3 Comparing activity systems

As discussed in Section 8.2, this study found multiple factors encouraged or discouraged the seven pairs to discuss LREs with peers for language learning. To demonstrate how the interactions of multiple factors encouraged the seven pairs to engage in language learning by discussing LREs with peers in different ways, this section compares the activity systems of Pair 6 (Jiyoung/Walter) and Pair 7 (Rena/Rita), who discussed the most and the least LREs, respectively among the seven pairs by drawing on Activity Theory (Engeström, 1987, 1996, 1999, 2001), the concept of 'contradiction' (Engeström, 1987, 1996, 2001) and 'interacting activity systems with a three-layered learning environment model' developed for this study.

8.3.1 Activity systems of Pair 6 (Jiyoung/Walter)

Pair 6 (Jiyoung/Walter) developed patterns for 'collaborative knowledge constructions'. The pair demonstrated the most active interactions with peers for language learning by initiating and resolving the largest number of LREs among the seven pairs during the project (see Section 5.3 in Chapter 5). Figure 8.2 provides a visual representation of their activity system and the mediation factors, adhering to analytical procedures 1-4.

Several components of Jiyoung's and Walter's activity systems showed the factors which encouraged them to discuss LREs for language learning. The left triangle in Figure 8.2 shows Jiyoung's activity system with the mediating factors. It reveals three positive factors

encouraged her to discuss LREs with Walter for language learning: 1) Object: improving vocabulary and pronunciation; 2) Community: positive perceptions of her peer as a learning resource; and 3) Community: working with a peer of a similar language proficiency level. Walter's activity system and the mediating factors are presented in the right triangle in Figure 8.2. It reveals three positive factors motivated Walter to discuss LREs with Jiyoung for language learning: 1) Subject: self-efficacy as a language learner; 2) Rules; rules as a language learner; and 3) Community: positive perceptions of his peer as a learning resources. This section first summarises the characteristics of their interactions for language learning and then compare the factors impacting both participants as per the six components of their activity system. This section concludes with a discussion of how the interactions of their mediating factors encouraged Pair 6 to engage in active discussions of LREs for language learning.

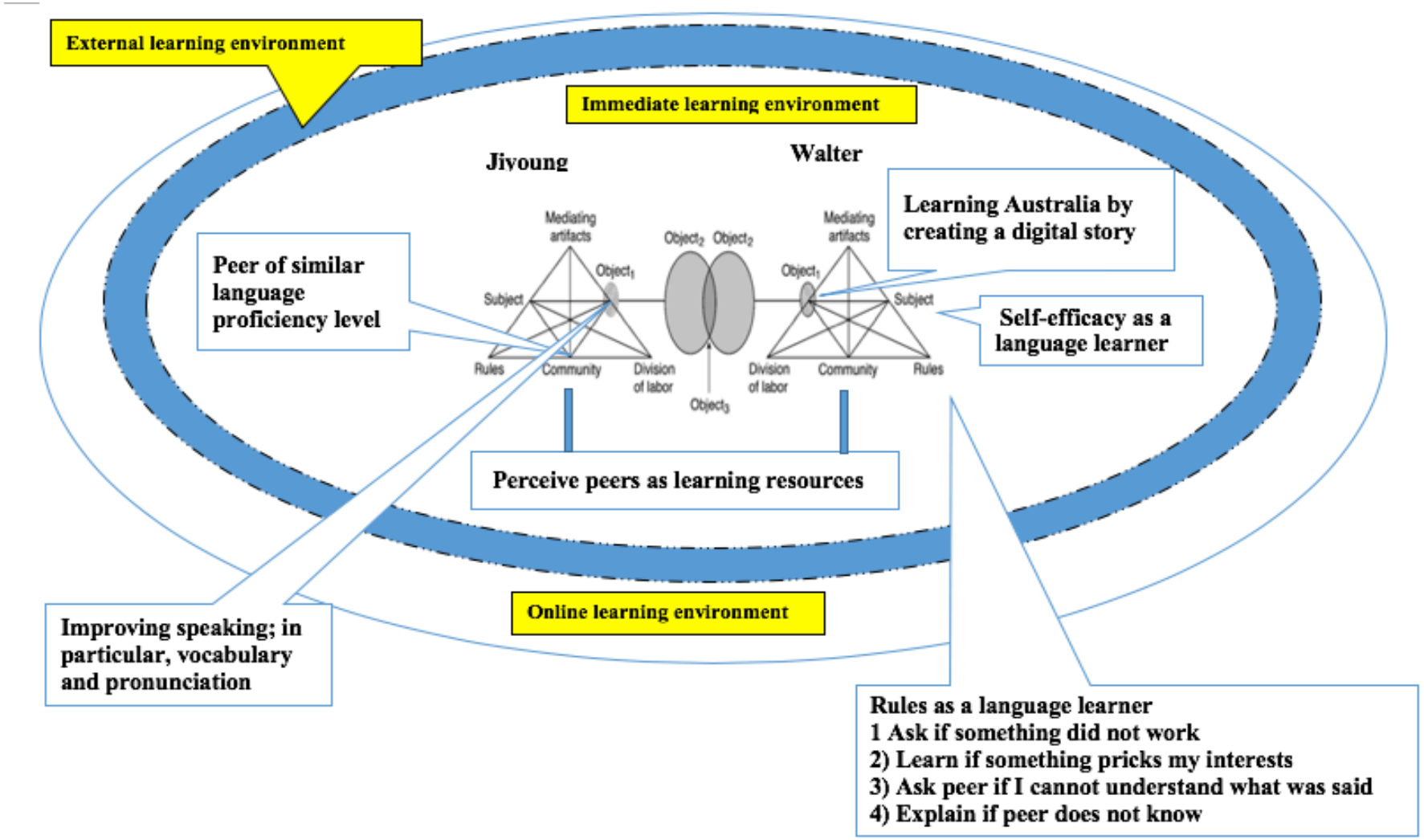


Figure 8.2: Factors mediating interactios for language learning by Pair 6 (Jiyoung/Walter)

1) Community: Positive perception of peers as a learning resource

Both Jiyoung and Walter perceived that peers working in the same community were a useful resource for learning Japanese. This positive perception of their peer encouraged them to discuss LREs with them. The benefit to Jiyoung and Walter from discussing LREs together was to create opportunities for discussing usage and meaning of Japanese by sharing their different strength as a user of Japanese. Jiyoung often used Chinese-origin Japanese words as she had learned Japanese mostly in formal learning contexts; whereas Walter had developed a large vocabulary of Japanese-origin words by watching Anime and by actively socialising with Japanese native speakers in online and offline settings. For Jiyoung, Walter's knowledge of Japanese-origin words, which he developed with "his own passion and with his own method", was a useful resource for learning Japanese. She reported that she learned Japanese-origin words through her discussions with Walter. On the other hand, Walter had not learned Japanese at university and so he regarded Jiyoung's academic Japanese as a useful resource to learn Japanese. Walter commented that he learned different formalities and ways of thinking and writing in Japanese via his discussions with Jiyoung. Thus, the findings suggested that both Walter and Jiyoung were motivated to discuss LREs together as they believed they could learn by sharing their different Japanese language knowledge and strengths.

2) Community: Working with peers with similar proficiency

For Jiyoung, the Japanese language proficiency level of the peers working in the same community was also an important factor in determining whether she actively discussed LREs with peers. Jiyoung reported that she was motivated to discuss LREs with Walter during this project due to his similar Japanese language proficiency level. Conversely, she felt discouraged to do so when she had worked on assignments with friends of a lower Japanese language proficiency level. When preparing for the assignments with her friends, Jiyoung did not

explicitly explain Japanese language usage to them. The reason she stated for this was that she did not want to be perceived as a “show off” to her lower proficiency level friends. However, Jiyoung explained that she could explicitly discuss Japanese usage with Walter due to his similar Japanese language proficiency level. Jiyoung illustrated her feelings about working with Walter in this way by stating; “Because I'm not better than him, I don't have to show off. There's no opportunity that I can show off, so I was like, ‘Okay, maybe I can go, like, explicitly’. And then, if I don't go explicitly, then that doesn't make a good discussion”. Thus, her comments suggested that working with peers of similar language proficiency levels may encourage learners to discuss LREs explicitly by mitigating their feelings of peer pressure.

3) Object: Developing speaking proficiency

Although Walter developed a non-language learning specific object; that is, learning more about Australia by creating a digital story, Jiyoung developed language learning focused objects; namely, to improve her speaking, vocabulary and pronunciation. Jiyoung indicated that the strategy to achieve her learning objects was to “speak in Japanese as much as possible” during the project. Adhering to her determination, Jiyoung actively initiated discussions of LREs with Walter, which led them to discuss the largest number of LREs. Jiyoung also made the effort to speak in Japanese with the Japanese researcher. Thus, her language learning focused objects encouraged her to actively discuss LREs with Walter as well as to speak in Japanese to the researcher.

4) Subject: Self-efficacy as a learner of Japanese

The subject-related factor which encouraged Walter to discuss LREs was his sense of 'self-efficacy as a learner of Japanese'. Given his advanced level Japanese, Walter could have easily formulated basic Japanese sentences. Instead, he chose to extend his linguistic knowledge by accessing language assistance from Jiyoung to construct more complex Japanese sentences. For the reason, he proudly stated; "It's because I believe I can do it".

5) Rules: Rules as a language learner

Walter developed four rules as a language learner which motivated him to actively discuss LREs with Jiyoung: 1) asking peers if something did not work well; 2) learning about a topic if it pricks my interests; 3) asking peers if I cannot understand what they have said; and 4) explaining Japanese usage if the peer did not understand. Adhering to rules one through three, Walter actively asked Jiyoung about the Japanese expressions he could not understand, or that he wishes to know more about. Rule four also encouraged Walter to explain Japanese usage to Jiyoung when he thought she did not fully understand. Walter demonstrated clearly his eagerness to learn Japanese when he used the occasion he sneezed during the project to improve his vocabulary. To clarify, when he sneezed he used it as an opportunity to learn Japanese by asking Jiyoung what Japanese word he should say when somebody sneezes in Japan. Walter illustrated his insatiable desire to learn as a language learner during a stimulated-recall session:

> I have been learning Japanese for four years. So, it is just habits. If I am surrounded by Japanese, then somethings pricks my interest in Japanese, I think I have to learn now. So, it comes naturally to me. Because I thought I was interested.

To sum up, a comparison of Jiyoung's and Walter's activity systems showed alignments in some areas; sharing positive factors encouraged them to discuss LREs for language learning. Both participants perceived peers who worked in the same community to be useful resources for learning Japanese. Thus, the findings suggest that peers working with others whom they perceive as good learning resources is an important condition to encourage learners to discuss LREs for language learning.

8.3.2 Activity systems of Pair *7* (Rena/Rita)

Pair 7 (Rena/Rita) developed a pattern for 'limited spoken interactions'. Their interactions were characterised by division of labour and limited spoken interactions. The first half of their script was completed individually by Rena before the writing sessions started. Although the pair completed the latter half of their script together, they did so by dividing the roles; that is, Rena as writer and Rita as information provider. Rita would monitor what Rena was writing using a shared screen connected to Rena's laptop and would search for relevant information to be included. Pair 7 also recorded the least number of spoken interactions for language learning. The pair discussed and resolved the least number of LREs among the seven pairs (see Section 5.3 in Chapter 5, and Section 6.3.1 in Chapter 6).

Figure 8.3 is a visual representation of Pair 7's activity systems and the mediating factors based on the aforementioned analytical procedures 1-4. Both participants' activity systems revealed several negative factors which discouraged the discussion of LREs with peers for language learning. The left triangle in the Figure shows Rena's activity system. It includes the three components indicating the negative factors to discourage her from discussions of LREs with Rita for language learning: 1) Object: non-interaction-oriented strategies; 2) Mediating artefacts: greater advantage to use online resources than to discuss LREs with peers; 3) Community: rejecting a peer as a resource for learning Japanese.

The right triangle in the Figure indicates Rita's activity system. It also shows the three components indicating the negative factors to discourage her from a discussion of LREs with Rita for language learning: 1) Object: non-interaction oriented learning object; 2) Subject: lack of confidence in Japanese; and 3) Division of labour: preoccupied with own tasks. This section begins by presenting the characteristics of Pair 7's interactions for language learning. It then provides descriptions of the factors which discouraged them from discussing LREs with their peer for language learning. The impact of interacting with peers who share negative factors discouraging discussions of LREs with peers for language learning is then discussed.

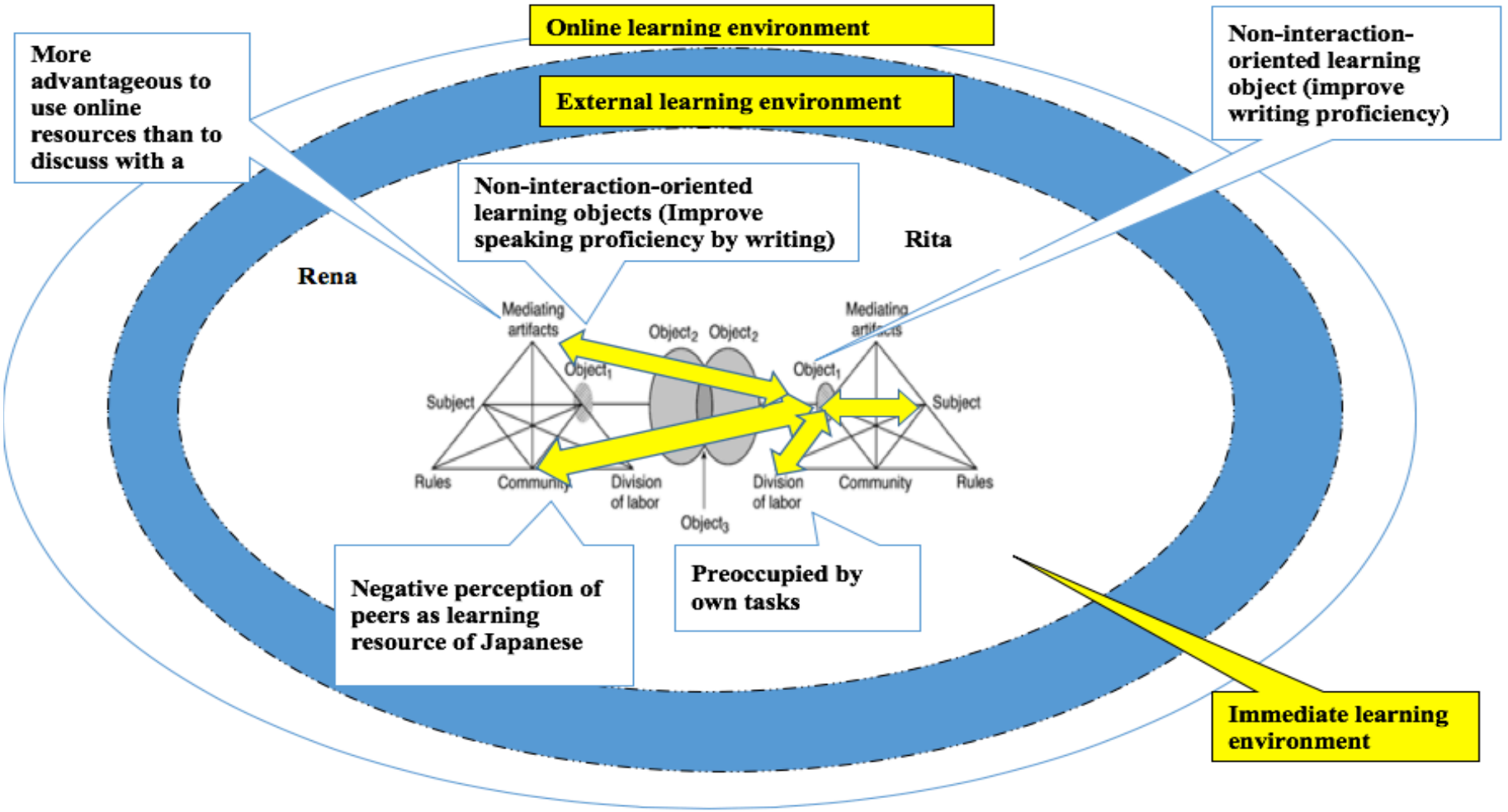


Figure 8.3: Factors impacting interactions for language learning by Pair 7 (Rena/Rita)

1) Object: Non-interaction-oriented learning object and learning strategies

First, non-interaction-oriented learning objects did not motivate Pair 7 (Rena/Rita) to discuss LREs to engage in language learning. For example, the learning object Rita aimed to achieve in this project was to improve her Japanese writing proficiency. The strategy she planned to adopt in order to achieve her learning object was to write several drafts of the script during the project. In contrast, Rena developed an 'interaction-oriented learning object' to improve her speaking proficiency. Her strategy to achieve her learning object however was to adopt a non-interaction-oriented approach to 'improve speaking by writing a Japanese script'. Thus, their non-interaction-oriented learning objects and the strategies they used to achieve them did not motivate Pair 7 to discuss LREs for language learning.

2) Subject: Lack of confidence in using Japanese

A subject-related factor which discouraged Rita from discussing LREs with her peer was her lack of confidence in her knowledge of the Japanese language. Both participants have realised Rena is more proficient in Japanese although both of them have enrolled in equivalent Japanese language courses at their universities. Prior to this project, Rita has often asked Japanese-related questions to her older sister (semi-structured interview with Rena). In this project, Rita initiated only one LRE to provide Japanese vocabulary which Rena might not know. She explained that the reason for not initiating LREs actively during the project was that she was not sure about her knowledge of Japanese.

However, Rita demonstrated an active engagement in discussions of LREs when Rena asked her about a Japanese expression Rena felt confident to explain: 'AはBほどーない' (A is not an adjective like B). Rita felt confident particularly in the expression she has learned during one-month study abroad program at a Japanese university. Rita indicated that she remembered the expression well as her teacher explained the usage very explicitly in the lesson.

Thus, Rita's comments suggested that level of learners' confidence in Japanese may encourage or discourage them to actively discussing LREs with peers, in particular to help resolving language problems experienced by more proficient peers. However, roles of language expert and novice learners take during collaborative learning are fluid (e.g., Ohta, 2001; Nishioka, 2014b). Rita's active engagement in discussing 'AはBほどーない' (A is not an adjective like B) demonstrated that even a less proficient learners can provide language assistance to a more proficient peer in some learning contexts due to their different expertise as the language learner/user.

3) Mediating artefacts: Perceived advantages of using online resources

The perceived advantages of using online resources over discussing LREs with peers discouraged Rena from discussing LREs with Rita to engage in language learning. For Rena, there were greater advantages from using online resources than from asking Japanese-related questions to Rita for the quick response. Rena described the advantages by asserting; *"*Checking a dictionary is faster (than asking Japanese related questions to Rita) as I have a laptop (with me). If I ask her (about Japanese vocabulary) she checks (the word using her laptop) anyway". Rena's comment suggests that the easy access to online resources and the perceived advantages of the resources encouraged some learners to resolve their language problems by themselves by consulting with online resources, even though their peer is situated in the same physical learning space.

4) Community: Rejecting peers as learning resources

How participants perceived their peers who were working in the same community as learning resources is an important factor in determining whether they discussed LREs with peers for language learning. Rena was discouraged from asking Japanese-related questions to

Rita as she denied her as a resource for learning Japanese. Rena described her distrust of Rita as a learning resource by stating; "I don't trust her (Japanese) grammar as she is the one who's always asking me grammar" and "I can read (*kanji*) better than her". Thus, her negative perception of Rita as a resource for learning Japanese encouraged her to resolve her language problems by searching online resources excepting the two LREs she initiated with Rita.

5) Division of labour: Preoccupied with own tasks

Division of tasks and roles also discouraged Rita from initiating discussions of LREs with Rena by creating contexts where Rita was preoccupied with her own tasks. Pair 7 completed their writing task by allocating different roles to each other; that is, Rita searched for information using her laptop while Rena completed the writing (see Section 5.3.4 in Chapter 5). Adopting a division of labour approach created a context in which Rita was preoccupied with her own tasks; namely, searching online resources. When discussion this as one of the factors for why she did not initiate LRE discussions, she commented that she could not identify any Japanese errors in Rena's script because she was busy skim-reading the information on websites. The findings suggest that completing the project by dividing the tasks and roles may discourage language learners from discussing LREs with peers by diverting their attention away from analysing and discussing language use.

To sum up, Pair 7 (Rena/Rita) developed the least number of spoken interactions to discuss LREs for language learning among the seven pairs. As such, their interaction patterns were mediated by several negative factors which impacted their discussions of LREs with peers including: 1) lack of confidence in Japanese language use; 2) preoccupied with own tasks; and 3) negative perceptions of peers as a resource for learning Japanese. A comparison of their activity systems also revealed dual contradictions in the achievement of Rita's learning objects: 1) inner contradictions; and 2) secondary contradiction. Rena's 'inner contradiction' emerged

from the contradictions between her learning object (improving Japanese by writing) and lack of confidence in Japanese language usage. Her 'secondary contradictions' developed due to the two contradictions in her and Rena's systems: 1) contradictions related to Rita's learning object vs. Rena's perceptions of Rita as a learning resource; and 2) contradictions related to Rita's learning object vs. Rena's perceived advantages of using online resources over discussions of LREs with Rita. Thus, interactions with peers which develop incompatible negative factors may cause 'contradictions' in their activity systems, and consequently, discourage them from discussing LREs for language learning.

8.3.3 Summary

This section compared the activity systems of Pair 6 (Jiyoung/Walter) and Pair 7 (Rena/Rita), who developed the most and the least number of LREs, respectively among the seven pairs. The two sets of pairs showed distinctive differences in their activity systems. The activity systems of Pair 6 (Jiyoung/Walter) showed alignment; that is, developing positive factors which encouraged them to discuss LREs with peers for language learning. Both participants perceived their peer as a useful resource for language learning and reported that they learned about a different way to learn Japanese from their peer. Thus, the interactions with their peer who shared similar positive factors further encouraged Pair 6 (Jiyoung/Walter) to actively engage in discussions of LREs for language learning.

On the other hand, the activity systems of both Rena and Rita (Pair 7) revealed several negative factors towards discussing LREs with peers. In addition, their activity systems included contradictions at two levels: 1) inner contradictions in Rita's activity system; and 2) secondary contradictions between Rita's and Rena's activity systems. Pair 7 (Rena/Rita) developed contradictions as a result of their interactions with each other which consequently discouraged them from discussing LREs for language learning. Thus, a comparison of Pairs 6

and 7 suggested that developing positive and compatible factors with peers supporting LREs discussion for language learning is important to encouraging learners to engage in learning Japanese by discussing LREs with peers.

8.4 Factors encouraged the participants to engage in individual language learning

Several studies of short-term collaborative learning tasks have investigated the language learning process in contexts where learners discussed LREs with peers to resolve their language problems (e.g., Dao & McDonough, 2017; Park, 2015; Watanabe & Swain, 2008). However, the findings discussed in Chapter 7 showed that some participants chose to engage in learning Japanese individually, even though their peers were in the same physical environment: 1) taking a cooperative learning approach by completing different parts of their writing tasks synchronously; and 2) resolving their language problems individually using online resources instead of discussing LREs with peers. The findings raised an important question; Why do some learners chose to take individual learning approaches even though their peers are in the same physical space. To answer this question, this study discusses the factors to have encouraged them to engage in learning Japanese individually during the sessions by drawing on conceptualisations of a human activity system (Engeström, 1987, 1996, 1999, 2001), contradictions (Engeström, 1987, 1996, 2001), and 'interacting activity systems with a three-layered learning environment model'.

This section discusses how interactions of multiple factors encouraged three pairs to take individual and cooperative learning approaches despite the presence of their peers in the same physical environment. The findings will be presented in the following order; 1) valuing similar learning approaches (Section 8.4.1); 2) experiencing inner contradictions (Section 8.4.2); and 3) experiencing both inner and secondary contradictions (Section 8.4.3). This section ends by comparing the three pairs' activity systems and the impact on their learning approaches.

8.4.1 Valuing similar learning approaches

Pair 4 (Brian/Po) are discussed first to demonstrate how valuing similar learning approach encouraged the participants to engage in learning Japanese individually using online resources while their peer was in the same physical space. Brian and Po each perceived the other to be a valuable resource for learning Japanese. Po described Brian' strength as a language learner as his knowledge of Japanese in direction. Brian perceives Po to be better than machine translations for determining "what sounds more natural" in Japanese. Despite the positive perceptions of their peer as a learning resources, the pair chose to complete their writing task by writing different lines using Google Docs. They also resolved some of their linguistic problems by consulting online resources, even though they initiated discussions of LREs for this purpose. As such, their learning behaviors were mediated by the similarity in the learning approaches they valued: 1) working on learning tasks cooperatively as well as collaboratively; and 2) resolving language problems individually using online resources.

Figure 8.4 presents a visual representation of the activity systems of Pair 4 (Brian/Po) and the factors mediating their adoption of an individual learning approach. The left triangular in the Figure shows Brian's activity system and the mediating factors; whereas the right triangular indicates Po's activity system and mediating factors. The pair decided to complete the written task by writing different lines synchronously using Google Docs instead of working on the same part of the task together. This decision was mediated by the common practices apparent in their academic communities in other university subjects; namely, completing different parts of their group assignments using Google Docs. The functional capability of Google Docs motivated Po to work on the writing task using the application. Po described the advantage of this approach by claiming that it provided "real time remote collaboration on the same document".

The drawback from working with Google Docs is that is can create a context in which both participants become preoccupied with completing their own lines. To avoid distracting Brian who was preoccupied with his own writing, Po tried to resolve the language problems related to his own lines by consulting online resources. He stated that the reason for this was "because it (searching Google for Japanese words) is much faster (than discussing LREs with Brian to resolve my language problems). If I ask (Brian Japanese words), I interrupt his current task. But I can search for Japanese words easily using Google. All I have to do is to open the tab and just type it. That's it. If I ask, he has to stop things".

In addition to the speed benefit, the additional linguistic information provided by Google motivated Po to resolve his language problems using this platform. Such information included graphic images of the Japanese words (details of the discussion are provided in Section 7.3 in Chapter 7). Brian also tried to resolve some of his language problems by consulting online resources instead of asking Po. He provided two reasons for this individual learning approach during writing stage: 1) easy access to online dictionaries using his laptop; and 2) it allowed him to better remember the Japanese words when he types and searches the words online by himself.

To sum up, the activity systems of Pair 4 (Brian/Po) showed alignment by valuing similar learning approaches: 1) completing different parts of the group assignments using Google Docs; and 2) perceived advantages of resolving language problems using online resources. The interactions of peers' similar values encouraged them to engage in language learning by adopting cooperative and individual learning approaches.

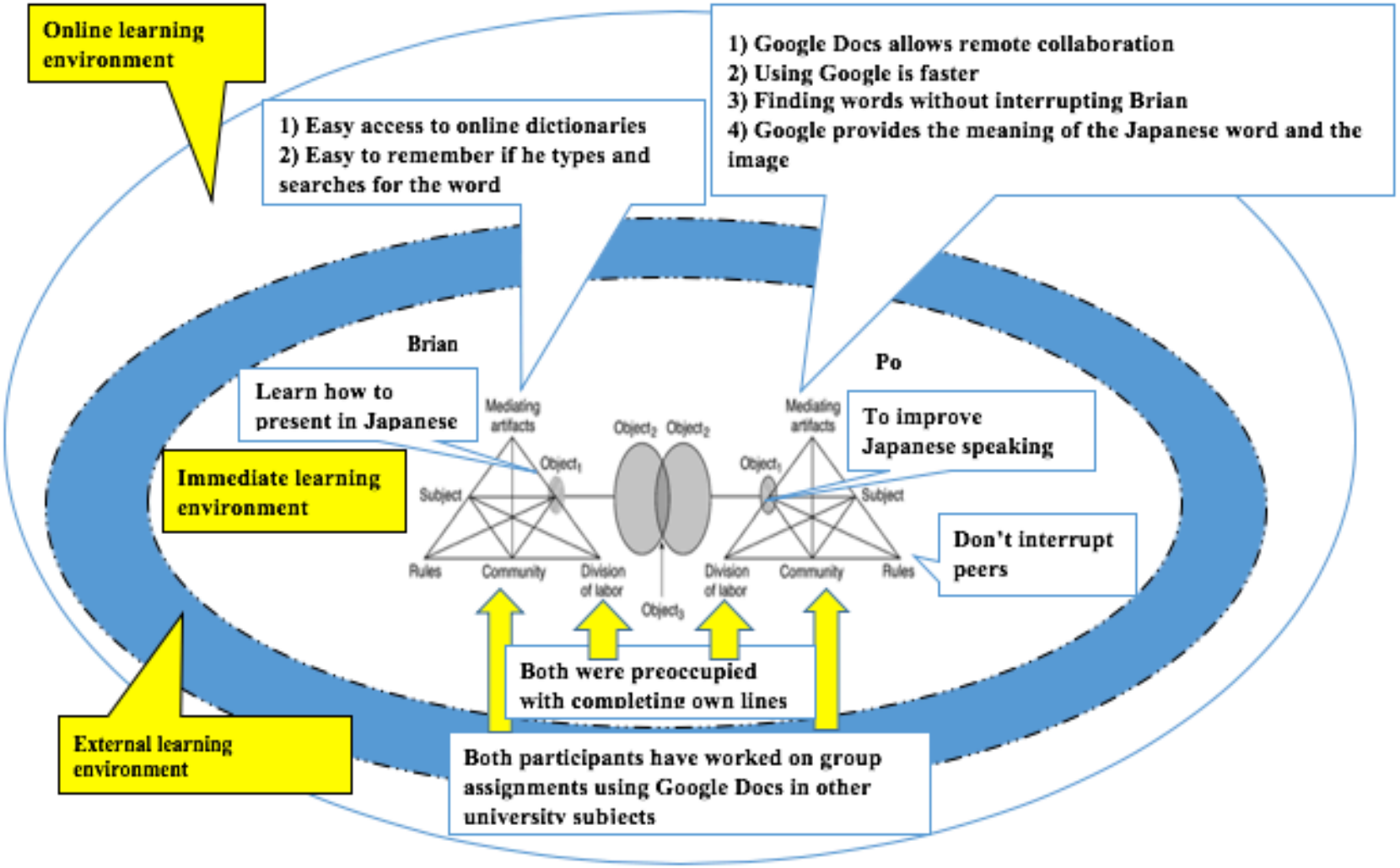


Figure 8.4: Factors encouraging Pair 4 (Brian/Po) to learn Japanese individually using online resources

8.4.2 Experiencing inner contradictions

Pair 3 (Sherry/Stephanie) demonstrate how 'inner contradictions' experienced by one learner encouraged the pair of learners to adopt a cooperative and individual approach to learning Japanese. Stephanie, a low-level Japanese language proficiency learner, and was paired with Sherry, who has advanced-level Japanese language skills. Sherry showed her willingness to write collaboratively with Stephanie by providing language assistance to her. In turn, this learning contexts could have provided Stephanie with more opportunities to learn Japanese such as writing the Japanese script with language assistance from an advanced-level learner. Despite the possible benefits, Stephanie did not adopt this learning approach. Shortly after the pair started to write their Japanese script, Stephanie suggested that they write the Japanese script using Google Docs so that they could write different parts of the script synchronously. Her suggestion was immediately accepted by Sherry who had previous experience completing group projects using Google Docs. While writing the different parts of their script, Stephanie completed only the sections she could do independently based on her Japanese language proficiency level. She initiated only one LRE, and resolved the rest of her language problems by consulting online resources. Stephanie's cooperative and individual learning approaches were mediated by 'inner contradictions' in her activity system.

Figure 8.5 shows the activity systems of Pair 3 (Sherry/Stephanie). Sherry's activity system and the mediation factors are presented in the left triangle; whereas Stephanie's activity system and the mediation factors are presented in the right triangle. As seen in the Figure, some factors in Sherry's activity system aligned with Stephanie's system such as the approach to write different parts of the script synchronously using Google Docs. First, Sherry developed a rule; we need our own time to write sentences. This rule is compatible with Stephanie's suggested approach as Google Docs allows each participant to work on different part of the same document at their own pace. In addition, completing a group project by working on

different parts of the project asynchronously using Google Docs was also commonly practiced by Sherry in other learning communities due to scheduling conflicts with her classmates. Therefore, Stephanie's suggestion to write different parts of the Japanese script using Google Docs aligned with the practices Sherry was accustomed to when working in academic communities for other university subjects. Therefore, Sherry immediately accepted Stephanie's suggestion to write their script using Google Docs. Due to prior experiences of using Google Docs, Sherry easily set up the platform so that both they could access to the same Japanese script.

Thus, Stephanie's activity system does not show any contradiction with Sherry's system. However, Figure 8.5 indicates several 'inner contradictions' in Stephanie's activity system; namely, contradictions in factors related to 'Division of labour' vs. 'Subject' and 'Rules' vs. the 'Community'. From Stephanie's perspective, discussing and writing the Japanese script with Sherry created a context in which Sherry adopted the role of Japanese language teacher by explaining Japanese usage and meaning to Stephanie due to her limited Japanese language proficiency. In other words, it created a division of roles: Sherry as Japanese teacher and Stephanie as learner. Such role division causes three types of inner contradictions to emerge in Stephanie's activity system.

First, the role division contradicts with the Subject in Stephanie's activity system; her preference for self-efficient language learning. For example, Stephanie had learned Italian in a self-efficient way by listening to recorded dialogues by the teacher in her own time. Therefore, Stephanie did not want to write the Japanese script in a way that required Sherry to adopt the role of Japanese teacher.

Second, the division of roles as Japanese teacher and Japanese learner contradicts the rules Stephanie developed for this project; namely, to work practically and not to rely on peers. Stephanie believed that requiring Sherry to adopt the role of teacher was not practical as it may

take up a lot of Sherry's time to teach Japanese to Stephanie. Requiring Sherry to adopt the role of teacher also contradicted her rule to be a self-efficient learner; that is, to not rely on peers.

Third, the division of labour as a Japanese teacher and a Japanese learner also contradicted Stephanie's practices in the other learning communities in which she was situated: 1) self-efficient learning; and 2) completing projects by dividing tasks and roles among the members of the group. Stephanie wanted to work on the project self-efficiently rather than rely on her peer as a Japanese 'teacher'. Due to the different practices in other learning groups, she was accustomed to completing the project by dividing the tasks with other learners. Therefore, the process of discussing and writing together with Sherry contradicted the practices with which she Stephanie was familiar.

Stephanie's strategy to mitigate these contradictions while engaging in Japanese language learning was to suggest to Sherry that they write their script using Google Docs. Both Sherry and Stephanie had experience completing assignment using Google Doc and as such were familiar with its functional capabilities; namely, allowing multiple users to work on the same document synchronously or asynchronously by monitoring the progress of their work in real time. Reflecting on her prior experiences and knowledge of using Google Docs, Stephanie realised that she could use the platform as a strategy to participate in the writing task at her own level and as a self-efficient learner. That is, she could complete some of the sections independently according to her language proficiency level using Google Docs. Stephanie expressed the benefits of using Google Docs to complete the writing task from the perspective of a less proficient language learner:

> Well, because in Google Docs you can both be working on the same thing at once. What it allowed me to do was go through and identify as much that I could do without Shelly's assistance, and then with the remaining things I asked her, okay, how would I do this? Is this correct?

From a language educator's perspective, Stephanie could have situated herself in an ideal learning context in which an advanced-level learner was willing to write the script collaboratively with a less-advanced learners by providing language assistance. However, Stephanie rejected this learning approach as it contradicts her activity system. To engage in language learning in a way that mitigates her inner contradictions, Stephanie transformed her learning environment by strategically using Google Docs; that is, learning Japanese self-efficiently; working practically by taking a cooperative approach, completing the project using a learning approach common in her academic community. Thus, the findings suggest that the strategic use of online resources may empower learners, in particular less proficient learners, by allowing them to engage in language learning self-efficiently to some extent.

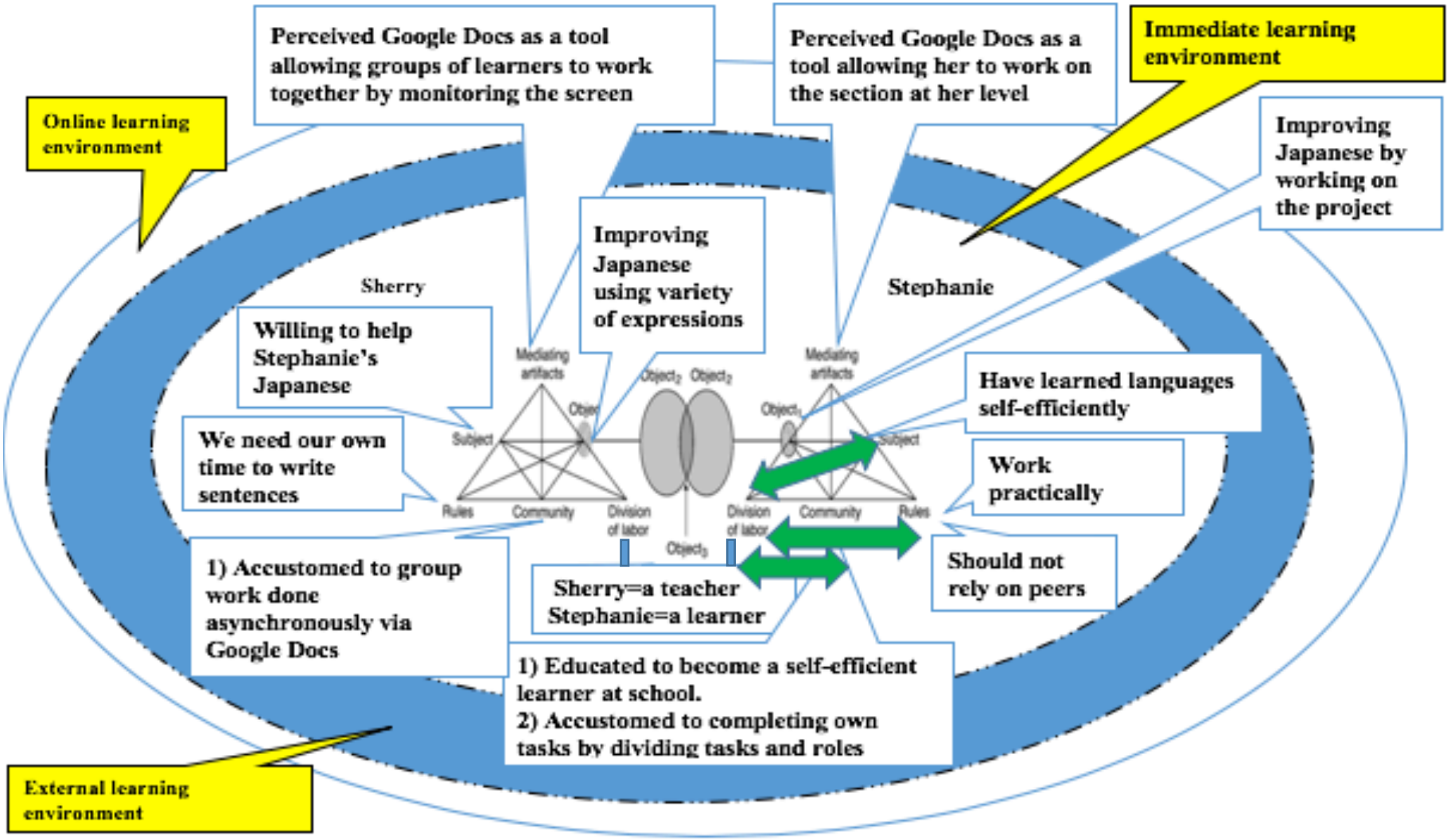


Figure 8.5: Factors encouraging Stephanie (Pair 3) to engage in language learning outside collaborative dialogue

8.4.3 Experiencing both inner and secondary contradictions

Pair 1 (Tessie/Yujin), comprised an intermediate (Tessie) and a low-intermediate (Yujin) learner of Japanese. As such, the Pair demonstrates how inner and secondary contradictions experienced by the less proficient language learner encouraged her to adopt a cooperative and individual learning approach during the project. Prior to this project, Tessie aimed to improve her Japanese language proficiency by discussing Japanese grammar with her more proficient peer, Yujin. However, Tessie decided to adopt a different learning approach in this project in two ways: 1) completing the Japanese script individually by dividing the writing task into two; and 2) resolving language problems by herself as much as possible using online resources. To resolve her language problems by herself, Tessie used multiple online resources including online dictionaries, relevant websites, Google Translate, and relevant video clips. Tessie's cooperative and individual learning approach was mediated by the dual contradictions in her activity system; the inner and secondary contradictions.

Figure 8.6 indicates the activity systems of Pair 1 (Tessie/Yujin). The left triangle in the Figure shows Tessie's activity system and the mediating factors; whereas the right triangle in the Figure represents Yujin's activity system and mediating factors. As seen in the Figure, Tessie's activity system shows three types of inner contradictions; namely, that her learning object contradicts with Subject, Rules and Community factors. First, her learning object to improve her Japanese language proficiency by discussing Japanese grammar with Yujin contradicts her Subject factor preference to write individually. The second inner contradiction occurs between her learning object and the rule she developed for the project to work efficiently. Tessie wanted to improve her Japanese by discussing Japanese grammar with Yujin. However, this learning approach would take longer than writing the script individually because Tessie must invest her time in discussions of Japanese grammar with Yujin. In other words, Tessie's learning object contradicts her efficiency-oriented rule. At that time, Tessie was busy preparing

for exams and assignments, and she needed to prioritise completing her project efficiently by avoiding a time-consuming learning approach. The third inner contradiction is that her learning object contradicts the Community factor requiring Yujin to invest a lot of time in Tessie to explain Japanese usage and meaning. Tessie expressed the psychological burden she felt when asking many Japanese-related questions to Yujin, whom she did not know well, stating; "Because we did not know each other, and I did not want to ask (Yujin a lot of Japanese-related questions). It was like near her mid-term exam. So, I felt stressed to ask her questions as I do not want to bother her".

In addition to the aforementioned three inner contradictions, Tessie also experienced 'secondary contradictions' with Yujin's activity system. Tessie's object to improve her Japanese language proficiency by discussing with Japanese grammar and usage with Yujin, contradicts the Subject, Rules and Community factors in Yujin's activity system. First, Tessie's learning object contradicts the Subject factor in Yujin's activity system as Yujin preferred to write individually. Second, Tessie's learning object contradicts Yujin's efficiency-oriented rule to work less by dividing the tasks. From Yujin's perspective, discussing and writing with Tessie would increase her workload as it required her not only to complete the entire writing task, but also to explain Japanese meaning and usage to Tessie. Finally, Tessie's learning object contradicts the Community factor in Yujin's activity system. Yujin did not consider Tessie as a resource for learning Japanese due to her own stronger Japanese language proficiency. Therefore, the requirement on Yujin to discuss and write with Tessie, whom she did not consider as a resource for learning Japanese, contradicts the Community factor in Yujin's activity system.

Thus, Tessie's activity system shows both inner and secondary contradictions to engage in learning Japanese by discussing and writing with Yujin. Tessie's strategy to mitigate these contradictions was to suggest to Yujin that she write the Japanese script individually at home after allocating each other different parts of the script. Tessie also tried to resolve her language problems independently as much as possible by using online resources to reduce the number of questions she had to ask Yujin. Adopting such a cooperative and individual learning approach reduced the frequency with which she asked language-related questions to Yujin as she intended. However, Tessie commented at end of the project that her approach was not effective, stating; "I should not be afraid of asking questions. If I had questions, I should have asked her… Some questions I got from Google were wrong. It was not effective".

After the project's conclusion, Tessie had the opportunity to work with Yujin on a Japanese speaking test in their Japanese class which required them to create and perform a dialogue together. This time, Tessie adopted a different approach by asking more Japanese-related questions to Yujin. Tessie provided two reasons for adopting the different learning approach for the speaking test: 1) feeling comfortable to ask Japanese related questions to Yujin given they had developed a closer friendship; and 2) realising the importance of asking Japanese questions to more proficient peers on how to use Japanese accurately.

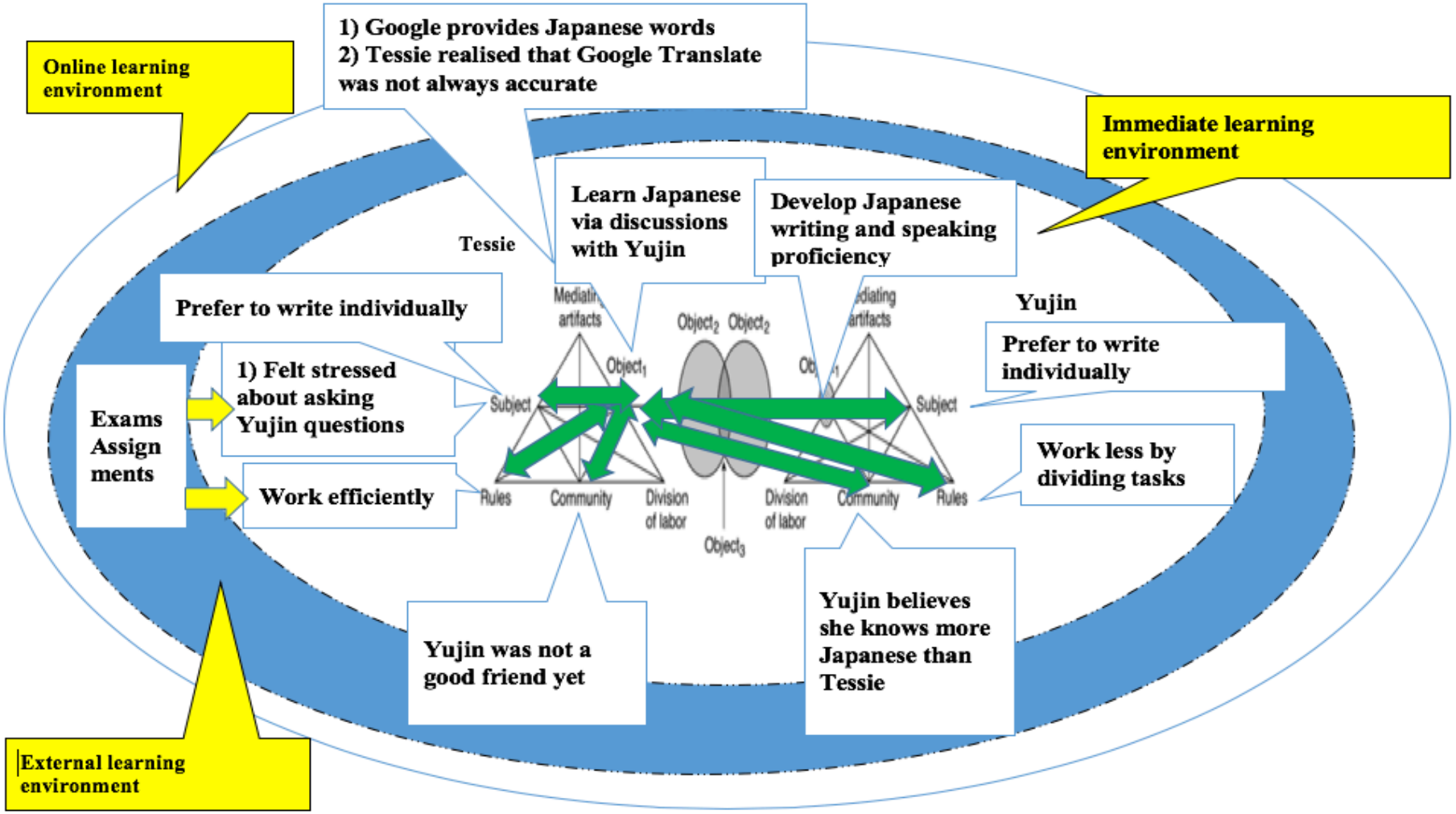


Figure 8.6: Factors encouraging Tessie (Pair 1) to engage in language learning outside collaborative dialgoue

8.4.4 Comparing the three pairs' activity systems and the impact on their learning approaches

To sum up, this section compared the activity systems of Pairs 1, 3, and 4 to demonstrate how activity systems consisting of different factors encouraged each pair to engage in learning Japanese by adopting different learning approaches. Pair 4 developed activity systems which aligned with the factors in their respective systems. This finding suggests that interactions with a peer who shares a similar learning approach (e.g., Pair 4) will encourage learners to adopt a cooperative and individual approach without resulting in contradictions to their activity systems. On the other hand, the activity systems of Pairs 1 and 3 revealed contradictions in the intra or inter activity systems to engage in language learning by discussing LREs with peers. Interestingly, the findings of this study revealed that the contradictions do not necessarily inhibit learner from engaging in language learning, but they did encourage them to transform their learning environment into one that allows them to engage in learning Japanese using their preferred methods; individual and cooperative learning approaches. Their strategic use of online resources enabled them to so.

8.5 Conclusion

This chapter examined how multiple factors mediated the ways in which the seven participant pairs of Japanese language learners engaged in learning Japanese during a collaborative digital storytelling project. The examination applied Activity theory, human activity systems, particularly (Engeström, 1987, 1996, 1999, 2001), the concept of 'contradiction' (Engeström, 1987, 1996, 2001), and interacting activity systems with a three-layered learning environment model. The factors mediating language learning in project-based learning activities has been underexplored in empirical research studies excepting for Parks

(2000). Her study examined the factors mediating the ways in which learners of English invested in learning language during a collaborative video project. In her study she draw on Activity Theory, the concept of 'motives'; that is, the reasons by the learners participated in the project (Leont'ev, 1978, 1981), and the notion of 'investment' (Norton, 1997). Her findings showed multiple factors mediated the ways in which the three focal participants invested in language learning during the project, including their perceptions of classroom learning and the project as a learning task, and their attitudes towards group work. However, applied the theoretical lens of human activity systems allowed this study to identify the ways in which language learning by the participants in this project was mediated by both personal factors and social dimension factors: 1) the rules they developed to work with on the project; 2) the learning communities in which they were/have been situated; and 3) how they divided the tasks and roles.

Another significant finding discussed in this chapter is the impact of the interactions among multiple mediation factors related to both learners on how they engaged in language learning during the project. Given that Parks (2000) analysed the impact on language learning in her project by focusing on the three focal participants, her study did not analyse the interactions of multiple factors brought by both learners in the pair to the project. To fulfil this research gap, this study examined the impact of multiple factors on language learning by analysing how the factors of one learner interacted with the factors of the other learner by drawing on the third-generation Activity Theory (Engeström, 2001), the concept of 'contradiction' (Engeström, 1987, 1996, 2001), and 'interacting activity systems with a three-layered learning environment model' which were developed to analyse the interactions of multiple perspectives in multiple activity systems in their learning environment. The analytical lens allowed this study to identify the interaction dynamics of multiple mediating factors in collaborative digital storytelling projects. Interactions with peers who developed similar factors

further encouraged them to engage in language learning using a shared learning approach. On the other hand, the findings revealed that some participants encountered 'contradictions' to engaging in learning Japanese by discussing LREs with peers. Some participants experienced contradictions between the learning approach and their own activity system; whereas other participants encountered dual contradictions: 1) ones between the learning approach and their own systems; and 2) ones between factors in their own and in their peer's activity system. These contradictions discouraged some participants from engaging in language learning by discussing LREs with peers.

The contradictions experienced by the participants necessarily discouraged them from engaging in learning Japanese during the project. Notably, Engeström (2001) asserted that 'contradictions' between interacting activity systems could be positive because the primary role of contradictions is as a "source of change and development" (p. 135). Supporting this argument, this study found that the contradictions the participants experienced in the project encouraged some of them to transform their learning environment so that they could engage in learning Japanese according to their preferred learning approach. The findings also highlighted two benefits of taking cooperative and individual learning approaches using online resources during long-term collaborative learning project, particularly for lower-level language proficiency learners: 1) participating in learning tasks at their language proficiency level; and 2) completing the tasks self-efficiently to some extent despite their limited language proficiency.

Chapter 9

Implications, limitations and further research

9.1 Introduction

As discussed earlier, previous studies have examined project-based language learning by taking a product-oriented approach; that is, how the teacher or student participants perceived learning outcomes. Therefore, very little is known about the processes learners use to construct knowledge when interacting with their peers during the project. This study aimed to extend our knowledge of project-based language learning by investigating quantitatively and qualitatively the processes engaged in by 14 learners of Japanese to construct knowledge of the language during collaborative digital storytelling projects. The major findings of this study and the contribution to the field are discussed in Section 9.2. Based on the findings and suggestions provided by the participants at the end of this project, Section 9.3 outlines the pedagogical implications for enhancing language learning during project activities. The limitations of this study are discussed in Section 9.4, followed by directions for further study. This chapter concludes by highlighting the importance of designing the learning environment to optimise learning outcomes in project-based learning by catering to the different strengths of learners, their interests, and learning styles.

9.2 Major findings of this study and the contributions to the field

This section discusses the major findings of this study and the contributions to literature on project-based language learning in the following order: 1) patterns of peer interactions (Section 9.2.1); 2) language learning in collaborative dialogue (Section 9.2.2); 3) language learning using alternative resources (Section 9.2.3); and 4) factors mediating language learning in this project (Section 9.2.4).

9.2.1 Patterns of peer interactions

An intriguing discussion within studies of collaborative language learning relates to what patterns of interactions learners develop with peers during their tasks to engage in language learning efficiently. Studies of short-term collaborative learning tasks have explored types of interactions learners engage in during face-to-face (Storch, 2002; Zheng, 2012). A few studies compared patterns of peer interactions learners develop while engaging in collaborative learning tasks both in face-to-face and synchronous text-based interactions (e.g., Rouhshad & Storch, 2016; Tan et al., 2010). Researchers working on short-term collaborative learning tasks have explored the impact of peer interaction patterns on language learning in the collaborative learning tasks (e.g., Storch, 2002; Watanabe & Swain, 2007). These studies classified patterns of peer interactions during tasks, using global analysis of learners' spoken interactions, while focusing on the concepts of 'equality' and 'mutuality' proposed by Damon and Phelps (1989).

What the findings of this study suggest is the need to analyse peer-interactions developed during long-term collaborative projects, according to each projection stage. The aforementioned studies that included short-term tasks, required participants to work on the same part of their tasks with peers by discussing LREs. However, this is not necessarily a norm for the participants working on a long-term project. The findings of this study showed a fluidity and complexity in their interactions during the long-term collaborative learning project. Each pair allocated their tasks and roles differently depending on their project stages. The results also showed some variations in distribution of TMEs and LREs, discussed by the seven pairs during the three production stages. Thus, the findings suggested the limitation of using concepts of 'equality' and 'mutuality' to analyse the complex and fluid nature of peer interactions observed during long-term collaborative learning projects.

Another important finding discussed in Chapter 5 was identification of unique interaction patterns observed during long-term collaborative learning projects compared with short-term collaborative learning tasks. 'Division of labour'; completing their project by dividing tasks (and roles), was the most frequently observed interaction pattern during this long-term collaborative learning project. This pattern was often reported by studies of cloud-based collaborative writing platforms (e.g., Li & Zhu, 2017; Rouhshad & Storch, 2016; Tan et al., 2010). The division of labour in short-term collaborative learning tasks have not been documented by studies conducted in face-to-face context such as Storch (2002), Watanabe and Swain (2007), although Storch (2001a) found that one pair completed their short-term writing task by dividing their roles as a dictator or scriber of the text.

The pairs in this study may have developed 'division of labour', which has been often reported only in cloud-based short-term collaborative learning tasks, due to the following two reasons. First of all, time pressure to complete their large-scale project may encouraged them to divide their tasks and roles during this long-term collaborative learning project. Secondly, the four pairs manifested 'division of labour' had their own writing tools in their hands during their project; three pairs had their laptops, while one pair had their notebooks. Ownership of laptops or papers may have encouraged them to complete their writing task by dividing their tasks.

This study also identified two new interaction patterns which were not reported by previous studies on collaborative writing tasks both in face-to-face interactions and online platforms (e.g., Bradley et al., 2010; Rouhshad & Storch, 2016; Storch, 2002; Tan et al., 2010). Firstly, 'collaborative storytelling' is characterised by astrong focus on discussing the story structure, and secondly, 'limited spoken interactions' where a pair does not have active spoken discussing of TMEs and LREs. The pattern of 'collaborative storytelling' was observed in this study probably due to the task design; requiring learners to create a story in digital format.

Their expertise and knowledge of storytelling and digital creation may have also encouraged them to develop the interaction pattern during this project. Another new interaction pattern developed during this long-term collaborative project was 'limited spoken interactions'. Pair 7 (Rena/Rita) could complete their project by having few spoken interactions with peers due to affordances provided by technologies; exchanging their ideas by typing and monitoring the suggestions through a shared screen. In other words, using affordances provided by technologies encouraged the pair to develop the new interaction pattern which were not reported by previous studies comparing patterns of peer interactions both in face-to-face and cloud-based collaborative writing platform (e.g., Rouhshad & Storch, 2016; Tan et al., 2010).

Thus, findings discussed in Chapter 5 suggest that a long-term collaborative learning project encourages learners to develop different patterns of peer interactions than observed in previous studies involving short-term collaborative learning tasks. It also revealed relatively fewer interactions to discuss LREs with peers to construct knowledge of Japanese during this long-term collaborative learning project. Although previous studies of short-term collaborative learning tasks have documented that learners construct knowledge of their target language by discussing LREs with peers (e.g., Storch, 2002; Watanabe & Swain, 2007), this study found that discussing LREs with peers for language learning is not necessarily a norm for learners working on long-term collaborative learning projects. Only one out of the seven participants actively discussed LREs by working on the same part of their tasks throughout their projects. The findings discussed in Chapter 5 showed that learners working on long-term projects engage in language learning by taking a different learning approach from the ones in short-term collaborative learning tasks. The findings call for the need to adopt different analytical perspectives to understand language learning in long-term collaborative learning projects.

9.2.2 Learning Japanese in collaborative dialogue

In the field of project-based language learning, very little is known of the process by which language learners engage in language learning in project-based learning. To fulfil the research gap, Chapter 6 responded to Research Question 2 by analysing process learners of Japanese construct knowledge of Japanese by discussing LREs with peers. In particular, Chapter 6 compared and contrast the following aspects of LREs discussed in long-term collaborative learning projects quantitatively and qualitatively; 1) level of engagement in discussing LREs with peers; 2) outcomes of LREs discussion; and 3) functions of LREs served in peer-to-peer interactions. The findings revealed that pairs, consisting of advanced Japanese learners, engaged in discussing LREs for language learning more effectively.

With regards to levels of LREs each pair discussed, the core-high pairs (Pair 4, 5, 6) discussed LREs with peers by showing 'elaborate engagement' which Storch (2008) found more effective for language learning. Qualitative analysis of peer interactions also highlighted advantages of discussing LREs with 'elaborate engagement'; providing in-depth linguistic information to enhanced understand meaning and usage of Japanese expressions. On the other hand, the findings suggested that LREs with 'limited engagement' provided just enough information to resolve the participant' immediate language problems.

In terms of LREs discussion outcomes, the three pairs, consisting of high proficiency learners, also showed their advantage of being advanced learners of Japanese by resolving more LREs accurately than pairs who were not. The findings also supported those reported in previous studies showing higher language proficiency learners are more likely to engage in language learning efficiently in collaborative dialogue (e.g., Lesser, 2004; Williams, 2001).

This study also extended findings of Hsieh (2017) and Storch (2001c) by identifying multiple functions LREs serve in collaborative dialogue. What is worthwhile to note here is

that the three core-high pairs also demonstrated their strength as an advanced learners of Japanese; initiating LREs which are more likely to trigger LREs with 'elaborate engagement' such as LREs 1) requesting provision of a Japanese word or expression; 2) requesting explanation of a Japanese word or expression; and 3) explaining a Japanese word or expression.

Thus, findings discussed in Chapter 6 highlighted advantages of the core-high pairs in engaging in language learning by discussing LREs. Qi and Lapkin (2001) found that learners' language proficiency impacts on the level of their notice for reformulation made to their script by the native speakers. The core-high pairs in this study also demonstrated to notice and analyse linguistic features in-depth during collaborative dialogue with peers; it consequently encouraged them to discuss LREs showing 'elaborate engagement' as well as to initiate LREs functions which are more likely to trigger the ones with 'elaborate engagement'.

To sum up, the findings of this study suggested that learners' proficiency level is important factor to consider to engage learners in collaborative dialogue effectively. However, pre-task training of LREs discussion may help learners to discuss LREs showing 'elaborate engagement' as well as to correctly resolve their language problems.

9.2.3 Learning Japanese using alternative resources

To date, very few studies have examined how learners use alterative resources, other than their linguistic knowledge, to enhance language learning in collaborative learning except very few studies such as Hsieh (2017), and Lasito and Storch (2013). Chapter 7 addressed Research Question 3 by analysing how learners of Japanese used alternative resources to engage in language learning during a long-term collaborative learning project.

Most previous studies have examined language learning during short-term collaborative learning tasks whereby learners resolve their language learning problems only by pooling their linguistic knowledge with peers during collaborative dialogues (e.g., Lesser, 2004; Storch &

Aldosari, 2013; Teng, 2017). In contrast, this study provided new insights into the way in which language learners used a wide range of alternative resources to engage in language learning multiple learning contexts. The current study found that discussing LREs with peers by sharing own linguistic resources is just one of contexts where they engaged in language learning during the project. They also engaged in language learning by using alternative resources in multiple contexts including: 1) resolving language problems during collaborative dialogue using alternative resources; 2) taking an individual learning approach during the sessions by using online resources; and 3) engaging in language learning outside the sessions by using alternative resources.

The findings of this study also showed that the participants used a wide range of multimodal resources to engage in language learning both inside and outside collaborative dialogue. Hsieh (2017) demonstrated how use of multimodal resources such as topic-related websites and images used in the websites supported collaborative knowledge construction by learners of English. Building upon her study, this study further extended our understanding of multiple roles played by multimodal resources to enhanced language learning during collaborative learning projects.

In collaborative dialogue, multimodal resources played the following two roles to promote language learning; 1) encouraging pairs taking a cooperative approach to interact each other for collaborative knowledge constructions; and 2) providing linguistic information which their peers did not or could not provide. In particular, this study yielded a new insight of understanding how affordances provided by Google Docs encouraged pairs working cooperatively to engage in collaborative knowledge construction with peers. Visual presentation of peer's editing work helped the participants to identify language problems encountered by their peers in real time. The affordances allowed the peer to provide language feedback while their writing tasks were still progressing. Secondly, use of online resources also

enhanced language learning in collaborative dialogue by providing linguistic information the participants could not obtain in collaborative dialogue with peers. In particular, visual presentation of *kanji* helped the participants to learn how to write or pronounce *kanji* words. Visual images provided by Google also enabled the participant to understand the lexical meaning in-depth in a new way which descriptions of spoken communication could not achieve alone.

Outside collaborative dialogue with peers, use of multimodal resources also supported language learning undertaken by the participants in thee ways. First of all, social network with Japanese were used to promote spoken interactions with the native speakers. The interactions provided them opportunities to communicate with the native speakers using Japanese as well as to receive language feedback to their Japanese script.

Secondly, use of SNSs such as Facebook and Lang-8 connected the participants, who would otherwise do not have any chance to have face-to-face interactions with Japanese, to Japanese locating other counties. The written interactions via SNSs helped the participants to understand how their erroneous Japanese should be corrected in their own pace by indicating the correction visually.

Finally, resources used outside collaborative dialogue also encouraged the participants to learn Japanese self-efficiently by providing multimodal information learners can adopted for language learning. For example, audio information provided by audio recordings helped them to identify how they should improve their pronunciation self-efficiently, while written and visual images provided by dictionaries and websites enhanced their understanding of the lexical meaning as well as *kanji* words self-efficiently. Written feedback provided by Google Translate also helped the participants to detect their Japanese errors in their script self-efficiently by indicating how their Japanese sentences can be translated into English visually.

To summarise, the findings discussed in Chapter 7 provide new insights into the ways in which the use of alternative resources can enhance and expand opportunities for language learning beyond collaborative dialogue with peers. However, it can be anticipated that learners' ability to perceive and act on the affordances may impact on their resource use for language learning during the project. To encourage learners to use the affordances to engage in language learning effectively during long-term collaborative learning projects, it is important to raise their awareness of affordances provided by a wide range of multimodal resources, and to develop their ability and willingness to use them.

9.2.4 Factors mediating language learning in this project

To answer Research Question 4, Chapter 8 drew on the third-generation Activity Theory (Engeström, 2001), the concept of 'contradictions' (Engeström, 1987, 1996, 2001), interacting activity systems with a three-layered learning environment model to explore the factors which mediated how the 14 participants engaged in language learning during the collaborative digital storytelling project. Empirical research into the factors mediating how learners engage in language learning is scarce, excepting Parks (2000) who examined how the motives of language learners impacted how they engaged in language learning during a collaborative video project. Although her study demonstrated how the three focal participants invested in the language learning process differently due to their different motives for participating in the project, her study did not analyse how the different factors underpinning the interactions of the two learners impacted the way in which they engaged in language learning.

This present study extended the findings reported by Parks (2000) by analysing how interactions of multiple factors within a learner's activity system as well as with the ones of his or her peer's activity system mediate the ways they engage in language learning during a collaborative digital storytelling projects. The two language learning contexts of the analysis

were: 1) how pair interactions encouraged or discouraged the discussion of LREs for language learning; and 2) how multiple factors encouraged some learners to engage in language learning outside collaborative dialogue with peers. Third-generation Activity Theory and interacting activity systems with a three-layered learning environment model allowed this study to identify how interactions of multiple factors encouraged each pair to engage in language learning in different ways during the collaborative digital storytelling projects. Pairs who shared similar factors in their activity systems were encouraged to adopt a similar learning approach with their peers: 1) actively discussing LREs with peers; and 2) learning Japanese by adopting a cooperative and individual learning approach. On the other hand, some pairs developed contradictory factors to engage in learning Japanese by discussing LREs with peers in inner or intra activity systems. However, this study found 'contradictions' in activity system factors were not necessarily a hindrance to the participants' engagement in learning Japanese. The participants demonstrated an ability to transform their given learning environment to allow them to engage in learning Japanese using their preferred learning approaches.

In this study, the 'interacting activity systems with a three-layered learning environment model' were used to analyse factors mediating for language learning engaged in by the participants during the project. The model helped this study to identify how the participants' engagement in language learning during the project was mediated by interactions of various factors in multiple learning environment; 1) the immediate learning environment; 2) the external learning environment; and 3) the online learning environment. The findings suggested the needs to understand how learners engage in language learning during long-term collaborative learning projects from a broader and holistic perspective.

9.3 Pedagogical implications of this study

Following analysis of the findings and pedagogical suggestions provided by the participants at the end of this project, this study identified five categories of pedagogical implications: 1) provision of explicit written guidelines (Section 9.3.1); 2) grouping learners (Section 9.3.2); 3) pre-project training (Section 9.3.3); 4) project design (Section 9.3.4); and 5) instructions (Section 9.3.5).

9.3.1 Provision of explicit written guidelines

Three digital stories produced by other learners of Japanese were used in this project to help the participants to visualise the type of final product they were expected to produce. However, explicit written guidelines were not provided to the participants to describe the expected quality of their digital stories. Notably, Stephanie stressed the importance and benefits of providing to Australian students explicit written guidelines on how to develop their final products, stating; "Australian students really like to have good instructions. For example, every time we get an assignment, we receive a piece of paper with clear instructions of what is expected of us. That helps us to better visualise what we are creating".

9.3.2 Grouping learners

Two participants, Brian and Rena, provided three suggestions on how to group learners based on comparisons of their experiences during prior group assignments and in this project. Their suggestions regarding grouping learners are presented in the following order: 1) increasing the number of participants in each group; 2) grouping learners with peers of a similar second language proficiency level; and 3) grouping peers with learner with whom they feel conformable.

1) Increasing the number of participants in each group

As this project was designed as a pair work activity, Rena chose to work with her young sister, Rena. Prior to this project, however she had participated in group projects which required her to work with several classmates in the Japanese class. Comparing both learning experiences, Rena suggested that the design of this project could be improved by increasing the number of members in each group. She asserted that this project design change would provide learners with access to more opinions and insights from other language learners.

2) Grouping learners of a similar second language proficiency level

Two participants, Jiyoung and Rena, expressed their preference to work with peers who are similar proficiency level. Jiyoung commented benefits of working with peers in similar proficiency to discuss language problems explicitly without feeling she is showing off her Japanese. Rena also found working with such peers is more beneficial for practicing her Japanese. She has worked with her younger sister who has enrolled in an equivalent level of Japanese program in anther university during this project; whereas she had previously worked with a peer of a lower second language proficient level in a pair assignment in her university Japanese subject. She remembered she could barely communicate with the peer in Japanese due to his or her limited Japanese. Based on both collaborative learning experiences, Rena suggested that educators group learners with peers of a similar proficiency level. She described the benefits of this project design change, stating; “You can also put people in a similar language proficiency level. So, they can communicate (using target language)”.

Thus, the two participants showed their preference to work with peers who are in similar Japanese proficiency. On the other hand, findings of Storch and Aldosari (2013) suggested to paring learners differently according to the pedagogical goals. The authors recommend to pair a low proficient with a low proficient peer is useful to develop their speaking proficiency,

whereas pairing a less proficient learner with a more proficient peer is effective to encourage them to discuss language use.

3) Grouping learners with peers whom they feel conformable to work with

Throughout this project, Brian worked with Po. He has known Po for one year as a classmate in the Japanese class as well as a member of the Japanese and Australian students' associations at the university. Brian thought that his close friendship with Po allowed him to ask Po a lot of Japanese-related questions. He indicated that his dialogue with Po was a key factor in his ability to learn Japanese during the project. Based on his experiences, Brian asserted the importance of grouping learners with peers with whom they feel conformable, stating; "Generally if you know each other, you feel more conformable to talk to each other".

9.3.3 Pre-project training

The findings of this study indicated two concerns related to language learning: 1) engaging in language learning ineffectively during collaborative dialogues with peers; and 2) difficulties using resources for effective language learning. Based on the findings, this study suggested two aspects of pre-project training for consideration: 1) providing pre-model training on how to engage in collaborative dialogue; and 2) discussing resource use with the participants prior to commencing the project.

1) Providing pre-model training on how to engage in collaborative dialogue

As the findings reported in Chapter 6 show, some participant pairs manifested difficulties in engaging in effective collaborative dialogue for language learning. These participants discussed and resolved fewer LREs, and initiated fewer LREs with 'elaborate engagement' which Storch (2004) has asserted is necessary for effective for language learning. As Kim and McDonald (2011) demonstrated, the quality of the participants' collaborative dialogue may improve however by providing them with pre-modelling training prior to initiating the projects. Language educators can integrate activities requiring learners to practice discussion of LREs, in particular LREs showing 'elaborate engagement', with peers effectively after showing a model video. Such pre-modelling training may encourage learners to engage in collaborative dialogue more effectively for language learning.

2) Discussing resource use prior to their project

As discussed in Chapter 7, the participants strategically used a wide range of resources to engage in language learning both inside and outside of collaborative dialogue with peers. Their resource use not only increased the opportunities for language learning during this project, but also enabled them to engage in learning Japanese in ways which would have otherwise been difficult to achieve by discussing LREs with peers using only their own linguistic resources. Po and Lucie particularly demonstrated their expert knowledge of online resources for language learning by using multiple online resources according to their learning needs as well as by describing explicitly the advantage of using the resources for language learning. However, it can be anticipated that some learners may have limited knowledge of how to engage in language learning using online resources effectively for language learning (e.g., Lai & Gu, 2011; Lai et al., 2016a, 2016b). To assist learners to use online resources to enhance

their language learning during the project, educators can integrate activities into the project design where learners discuss how to use different online resources effectively according to their different learning needs prior to commencing the project.

9.3.4 Project design

This study found that learners' strategical use of interactions with Japanese native speakers to increase their opportunities for language learning during the project. Alternatively, the results also showed that some participants revised their script without engaging in a discussion with their peers and that this reduced their opportunities to discuss LREs with peers for language learning. Based on the findings, this study suggests two implications for project design: 1) integrating continuous interactions with Japanese native speakers throughout the project; and 2) integrating multiple opportunities for participants to discuss the revision process with peers.

1) Integrating continuous interactions with Japanese throughout the project

Pair 2 (Kasumi/Sky) communicated each other primarily in English. They discussed LREs for only 16 minutes during a time they allocated to provide feedback to each other on the Japanese script they had written individually. Thus, the pair did not have much opportunities to use and learn Japanese via collaborative dialogue with peers.

However, the pair increased their opportunities for language learning by voluntarily integrating two interactions with Japanese native speakers: 1) interviewing them to include their perspectives in their digital story; and 2) receiving feedback from them on their Japanese script. First, Sky's suggestion was to create a digital story about Australian university life based on interviews with Japanese international students studying at an Australian university. The project design provided Sky with an opportunity to interview his Japanese friends using both

English and Japanese, as well as to learn their perspectives of Australian university life. In addition, Sky suggested to Kasumi that she receive feedback on their Japanese script from her Japanese friends to enhance its linguistic accuracy. Sky decided to receive feedback from his Japanese friends in a face-to-face context. The face-to-face interactions with his friends provided him with the opportunity to learn more about the Japanese expressions that could not be directly translated from English. Alternatively, Kasumi decided to receive feedback from her Japanese friend in Japan by arranging a real-time text chat with her via Facebook. While interacting with her Japanese friend, Kasumi had to clarify what she has intended to mention in the script. This was done mainly in Japanese due to the weak English language skills of her Japanese friend. In other words, the text-based interactions with her Japanese friend provided Kasumi with opportunities to use Japanese for authentic communicative purposes; namely, 1) she needed to communicate in Japanese as her Japanese friend could not understand English well; and 2) she needed to ensure her ideas were understood by the Japanese native speaker regarding how to create a digital story using accurate Japanese.

As demonstrated by Pair 2, some participant pairs working on a long-term collaborative learning project may choose to prioritise the efficiency of their communication by communicating primary in English, which is either their mother tongue or a stronger foreign language. However, by integrating interactions with Japanese native speakers, especially continuous interactions with them throughout the project may provide a wide range of learning opportunities in authentic contexts to communicate using the target language. Following her experiences of the benefits of interacting with Japanese native speakers for language learning purposes during this project, Kasumi also suggested that language educators integrate "continuous interactions with Japanese" into the design of their collaborative digital storytelling projects.

2) Integrating multiple opportunities to discuss revision with peers

Peer discussions on how to revise their scripts provides them with the opportunity to analyse the flow of their story and language use. Moreover, they can stretch and consolidate their linguistic knowledge by discussing LREs with peers. Despite the potential benefits, only Pairs 2, 6, and 7 edited their script by discussing their revisions with peers. Pairs 1, 3, and 4 completed the editing tasks by letting the more language proficient peers revise it by themselves. Pair 6 edited their own section independently at home. Although the findings in this study showed that some pairs completed their editing tasks without discussing the process with their peer, such activities may have increased their opportunities to analyse their language use as well as to consolidate their knowledge of the target language.

To encourage learners to discuss the revision of their script with peers, educators can make this a requirement within the project design. Educators can monitor the discussion process by allocating class time for revision feedback. Educators can also assist learners to analyse their script from multiple perspectives by integrating multiple feedback sessions with other classmates and Japanese native speakers into the project design.

9.3.5 Instruction

Based on first-hand learning experiences during this project, Tessie, Yujin and Yuki provided the following three suggestions to improve the instructions for completing the collaborative digital storytelling project: 1) writing together; 2) spending more time on writing; and 3) evaluating scripts written by other learners.

1) Writing together

Tessie completed her Japanese script using two methods: 1) writing the first half of the script individually at home; and 2) writing the second half of the script individually by asking

Japanese related questions to her peer, Yujin. Based on her experiences of these writing methods,, Tessie suggested that language educators allow learners to write their script with a peer, stating; “I think we can have brainstorm together when we write. We learn more new words. If I and [Yujin] have discussed together, we could have learned more vocabulary of traditional ‘祭り’(festival) (which is directly related to our digital story)”.

Findings of Lesser (2001) and Storch (2005) have also suggested benefits of collaborative writing with peers. Language learners produce final products with higher accuracy by writing in a group compared with when they write in a pair or individually (Lesser, 2001). Writing in a pair encourages learners to generate more ideas and learn different views from their pair (Storch, 2005). Given the findings, educators can enhance efficiency of language learning during long-term collaborative learning projects by requiring them to write their script either in pairs or groups.

2) Spending more time on writing

Yuki believed that she learned Japanese the most during this project while writing her Japanese script. Based on her learning experiences, she recommended that language educators allow learners to spend more time writing a Japanese script, stating; “I think the script is the part where I'm learning the most Japanese, and also the audio recording”.

3) **Evaluating scripts written by other learners**

Pre-project activities in which the participants analysed Japanese scripts written by other learners of Japanese were integrated into the design of this project. Yujin indicated that the activities provided her with valuable opportunities to understand how to write effective scripts in Japanese. Realising the pedagogical value of the analysis activities, Yujin suggested that educators let learners evaluate Japanese scripts prior to their project by printing out the scripts,

stating; “Let us evaluate the script or what is good about that. What is bad about that. You can learn better (how to write our script)”. As Yujin recommended, evaluating and discussing quality of Japanese script with peers engages learners in actively analysing how to write effective Japanese script. As a result, such learning activity makes effective writing structure more visible to learners and encourages the learners to use them in their script.

To sum up, this section discussed the pedagogical implications to emerge from the findings reported in this study and the suggestions from participants at the end of the project on how to improve the project design. The implications discussed in this section referred to five domains: 1) provision of explicit written guidelines; 2) grouping learners; 3) pre-project training; 4) project design; and 5) instruction. Integration of these suggestions within future collaborative digital storytelling projects may enhance the efficiency of language learning and the learning experiences of the participants engaged in the project.

9.4 Limitations of the study

Although the findings in this present study provide new insights into language learning in collaborative digital storytelling projects, it has several limitations. First, the findings have only limited generalisability to other education and research contexts as this study was conducted on only one category of language learner; namely, learners of Japanese who studied Japanese in Australian higher education contexts. This study found that six out of seven pairs completed this collaborative digital storytelling project by dividing their tasks and roles in some or all production stages. As such, their learning behaviours may have emerged in part due to their prior experiences of collaborative learning projects in other university subjects. All participants had experienced group projects prior to this project as collaborative learning tasks and projects have been widely implemented in their learning contexts. As several participants commented, it is common practice for them to complete group projects in subjects at other

university by dividing the tasks and roles. The Australian higher education context may have therefore encouraged them to undertake this project using the same approach they have used in other university subjects. Therefore, research conducted in other education contexts, such as where learners are encouraged work together in collaborative learning projects or where learners have not experienced a collaborative learning project, may deliver different results. However, some of the findings discussed in this thesis are applicable to those in similar educational and research contexts.

The second limitation of this study is the difficulty in accessing data related to the participants' engagement in the project outside of the formal research sessions. For this reason, it was arranged for the participants to work with their peers in the same physical spaces. The participants voluntarily completed a part of their project outside the sessions for several reasons including: 1) to reduce the workload when required to work in the same physical spaces; 2) to interact with Japanese friends on campus or online; and 3) to further improve their work. As they did not audio- or video-record most of their activities outside the sessions and consequently there was only indirect access to the data through interviews with the participants.

In longitudinal projects, it is difficult for the researcher to have access to all relevant data as some of the research related activities occur outside the designated research spaces. However, observation provides researchers with "knowledge of the context or to provide specific incidents, behavers, and so on that can be used as reference points for subsequent interviews" (Merriam & Tisdell, 2016, p. 139). Considering the benefits and practicalities, this researcher could have observed some of the key activities engaged in by the participants for language learning outside the formal research sessions, with their consent, including: 1) face-to-face interviews with the Japanese native speakers accessed by some participants; and 2) receiving feedback from the participants' Japanese friends on campus.

In addition, some of the participants' activities outside the research sessions occurred online such as browsing websites, and receiving feedback using Facebook chat or Lang-8. This researcher could have sought accessed to the data generated through these online activities by requesting that the participants submit a chatting log and provide screen capture recordings. Such online data could have provided a more holistic and comprehension pictures of the online learning activities engaged in by the participants outside the research sessions. In addition, there is a wide range of screen capture software available to record the learning behaviour of students when using a computer to have conversations with interlocutors. These online interactions occurred while this researcher was not present, but may nonetheless have provided a rich insight into the nature of the language learning by the participants in multiple learning contexts when completing their long-term collaborative learning projects.

Lack of intra- or inter-rater reliability check also mitigated reliability of data analysis in this study. As I conducted this study with limited research fund, I decided to complete all coding procedures by myself instead of hiring a research assistant as the second coder. I did not conduct intra-rater reliability check as Nvivo which I used for the coding procedures did not have such function. However, reliability of the coding procedures could have been enhanced by conducting inter-reliability check using coding software which has such function or intra-reliability check.

Finally, another limitation of this study is the lack of pedagogical support provided to the participants to enhance their language learning. To investigate their language learning in naturally occurring contexts, this researcher did not provide any pedagogical support to enhance language learning except for integrating interactions with Japanese native speakers for Pairs 4 and 7 who participated in my PhD study in phase 2. To overcome this limitation, this study could have integrated pedagogical support into the project design to enhance language

learning such as requiring the participants to use a diary to reflect on their learning experiences and exploring the efficiency of learning by interviewing the participants.

9.5 Directions for further research

The findings and limitations of this study provide several directions for further studies in this field. First, the current study investigated the learning processes undertaken by only one category of language learners; namely learners of Japanese who studied Japanese in Australian universities. Further studies can reveal multiple learning experiences and perspectives of language learners during collaborative learning projects by conducting research in different educational and research contexts.

Second, this study analysed participants' learning activities outside the formal research sessions using interview data. Further research may seek to provide a more comprehensive picture of the learning activities the participants engaged in outside the sessions by obtaining the naturally occurring data to emerge from these learning activities. The researcher can also observe and record their face-to-face interactions with the native speakers outside the research sessions with their consent.

Thirdly, this study found that the participants used a wide range of multimodal resources to enhance and expand opportunities for language learning in this project. The findings suggested use of these resources provided them different kinds of learning opportunities they could have in collaborative dialogue with peers. Future studies can explore learners' resource use by implementing collaborative learning tasks or projects with different designs. Such inquiry may elucidate diversities of their resource use for language learning, and multiple benefits of using the resources to optimise language use and learning during this project.

Finally, this current study did not integrate pedagogical support into its design to enhance participant language learning during the project in order to investigate their engagement in

language learning in a natural setting. Further studies can integrate appropriate pedagogical supports into their projects such as pre-project training to discuss LREs with peers, practice activities in the use of multiple online resources to engage in language learning, and encouraging discussions of how to expand opportunities for language learning. Such research investigations can then explore the impact of the pedagogical support on language learning by observing and interviewing the participants. Moreover, the inclusion of pedagogical support may help to identify a variety of pedagogical strategies to enhance and increase opportunities for language learning during the project.

9.6 Conclusion

Project-based learning integrating Web 2.0 technologies such as collaborative digital storytelling projects have been increasingly implemented in language classrooms. As discussed in Chapter 2, language educators have increasingly adopted a wide range of Web 2.0 applications both in short-term and long-term collaborative learning projects. Given the growing adoption of Web 2.0 technologies in project-based learning, an increasingly important research area is the investigation of how learners engage in learning their target language using Web 2.0 technologies in project-based learning. How to enhance efficiency of project-based language learning using technologies is also of great pedagogical interest to language educators who have implemented or who wish to implement project-based learning activities using technologies, especially collaborative digital storytelling projects.

Analysis of the 14 participants' learning processes at both the macro and micro levels revealed that they adopted multiple language learning trajectories during the collaborative digital storytelling projects. The findings shed a new light on language learning in long-term collaborative learning projects; engaging in language learning by using multiple resources in multiple learning contexts. Discussing LREs with peers by pooling their linguistic knowledge

is just one of the repertoire for the participants working on long-term collaborative learning project. This study also found that their strategical use of alternative resources expanded their opportunities for language learning during this project by increasing their exposure to their target language as well as by providing different kinds of opportunities for language learning. In particular, their strategical use of online resources increased less proficient learners' participation to their project more equally by allowing them to solve their language problems self-efficiently for some degree to complete their given subtasks. Thus, the findings suggested that pedagogical support to use online resources strategically may empower learners, in particular less proficient learners, by developing their abilities to engage in language learning self-efficiently for some degree and by contributing to their collaborative projects more equally.

To conclude this the study, I would like to share valuable pedagogical suggestions provided by Lantolf and Pavlenko (2001). They assert that the role of the educator is to identify how to "enhance the likelihood that any give person will have the opportunity to learn and develop" by observing how they engage in learning and by interacting with them. The authors asserted the responsibility of educators by stating:

> Education, second language, or otherwise, has the responsibility of organizing the classroom community in ways that allow students to become aware of [gift of language is an ability the emerge in the course of the activity of learning and is not a prerequisite for it] and then to be actively engaged in co-constructing their own learning with others in the community. (p. 157)

Language learners have different strengths, learning objectives, interests and learning styles. Project-based learning such as a collaborative digital storytelling project, is a learner-cantered pedagogy which allows learners to flexibly structure their learning environment according to these personal factors by negotiating with their peers.

In addition, language educators can increase the likelihood of student language acquisition by embedding multiple forms of pedagogical scaffolding throughout their projects including: 1) providing prior project training and guidance; 2) outlining the learning structure

and raising participant awareness of language learning during the project; 3) providing on-going feedback; 4) integrating interactions with peers, native speakers, and other resources; and 4) encouraging learners to reflect on the efficiency of their learning approaches and learning outcomes. Embedding these multiple scaffolding forms throughout the projects would enhance the quality of the participants' learning processes, learning experiences, and learning outcomes.

The findings of this study provided new pedagogical insights into the language learning process during project-based learning, especially collaborative digital storytelling projects. I hope this study provides directions for further research which aims to investigate the types of pedagogical approaches required to improve language learning efficiency by responding to learners' preferred learning styles and personal learning needs.

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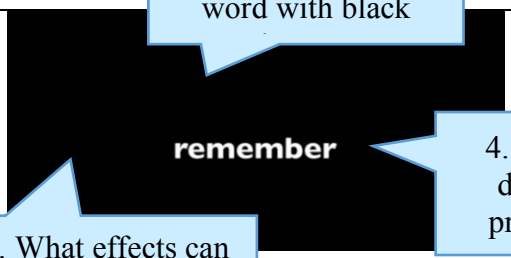
Appendix 1: A handout used during workshop

Workshop 1: What makes good digital stories?

Nishioka Hiromi (Macquarie University, Department of Linguistics, Ph.D. candidate)
(hiromi0504@gmail.com)

1. Digital Storytelling - Memories of Japan
https://www.youtube.com/watch?v=fvfjWhNwfhk

Watch first time
1. What do think of the digital story?
2. What is the strength of the story?
3. What technique do you wish to adopt in your stories?

		(Music)
0:07		They say nothing ever lost as long as you remember it. And I remember everything.
0:15		I remember "*hanabi*" (firework) in summer. Swimming in the river. Barbecue every weekend. The heat does not bother
0:18		I remember snowboarding with friends winter and sitting in "*kotatsu*"(electric table which has a heater), and eating all day. I did not care I was freezing.

2. What effects can we create by showing only a key word with black

3. What do you think of starting sentence?

4. What emotion does the music provoke to you?

1. What effects can you create by starting narration with delay?

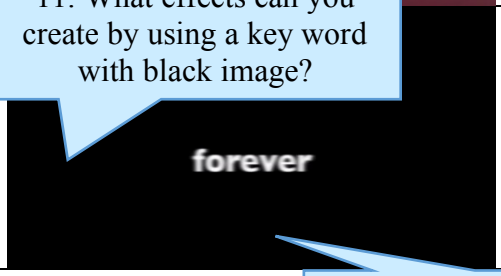
5. What do you think of the tempo of music and narration?

6. What do you think the volume of music and narration?

7. Do you think the meaning of images and narration matched?

8. What effects can you create by using the same pattern of starting?

9. What effects can you expect by showing the image of *Kotatsu* here?

		I remember constant awareness and pressure are always on the outside. Keeping my hands crossing behind for comfort.
1:42		Good or bad. All these memories are all memories now. Memories. That will be a part of me forever.

10. What emotions can the author express by using the images?

11. What effects can you create by using a key word with black image?

12. What do you think of the ending sentences?

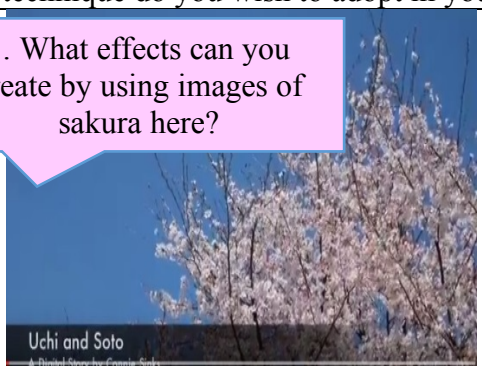
13. Do you think the message of music and narration matched?

2. Connie Sinks' Digital Story (Japan)

https://www.youtube.com/watch?v=wlyBX_jWad0

Watch first time

1. What do think of the digital story?
2. What is the strength of the story?
3. What technique do you wish to adopt in your stories?

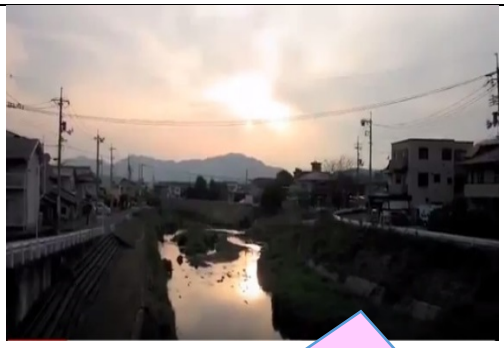
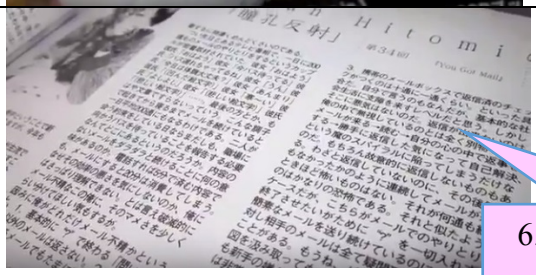
		Uchi and soto. This is one of the first concept you learned in Japan. Soto is outgroup where you start. Uchi or inside is where you strive to be. Japanese society is set to be highly hierarchical and this is the evidence.
0:17		Sometimes difficult factors to live life.

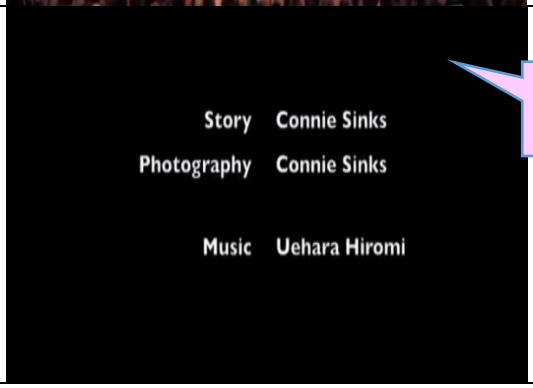
1. What effects can you create by using images of sakura here?

2.How do you evaluate the opening sentence?

3. What emotion does the image provoke

4. Is the transition from introduction to her own experiences is clear for you? If not, how can you improve to present the transition explicitly?

0:23	 5. Why do you think the producer used the image here?	My year studying in Hiroshima was filled with are small routine. There are Korean students asked me to tell all kinds of myself in English. He can practice English, and we can kill downtime and set a green tea.
		Cut
2:17		These people were listening while I was working in a part of some song. Suddenly I hear somebody accompany me on piano. …
2:27	 6. Why do you think the producer used the image here? 7. Why do you think the produce used jazz in back music in her	It did not matter whether I understand Japanese or not. Jazz passed us as language. In that moment, I entered their uc
		Cut
3:08	 8. Why do you think the producer used the image here?	Just before I leave Japan, MC was hold for us. Somebody in club bought flower for me and other exchange students. I was absolutely astonished. The person who bought flower has never spoke to us directly, but obviously there were something.

3:23		Music. It was the key inside space.
3:26		

9. Why do you think the producer used the image here?

10. What do you think of the length of showing the image?

11. What effects can you create by showing credit?

Appendix 2: Storyboard produced for editing practices
April 29, 2016　　Practice to edit with iMovie!!

	Title Terop	Images	Music	Narration
1	Title Trip to Taiwan			
2		“9分の丘”(Jofun hill) 	Music: Small village	
				Narration 1: Introduction
	Telop: Small village: Johun			
		“駅”(station) 		
				Narration 2: Small village
	Telop: Visit Jofun where past and present meet			
	Telop: The end			

Delay the star t of narration

Show telop longer

Make sure the volume of music does not interfere narration

Listen to music, and try to identify the best section to end the music and edit the timing. You can use fade out function as well.

Appendix 3: A recruitment advertisement distributed by lecturers

Digital storytelling project in Japanese

Create your digital story in Japanese, and share it with an audience around the world!!!

I am Hiromi Nishioka, a Ph.D student at Macquarie University.
I am looking for participants who can participate in a digital storytelling project in Japanese.

By participating in this project, you can

1. improve your Japanese proficiency !!!!!!!!
2. receive a $200 Kinokuniya gift card if you complete the project and
3. optionally receive free Japanese conversation lessons (up to three hours)

Please join in this study if you are

1. an intermediate or advanced Japanese learner
2. eager to improve your Japanese
3. willing to participate in 12 hour data collection
   (You can choose to attend either 2 full day workshops and 2 interviews or weekly workshop with an interview over 6 weeks. Data collection will not be conducted 2 weeks before final exam period.)

If you would like to participate or find out more, please contact Hiromi Nishioka
E-mail: hiromi.nishioka@students.mq.edu.au
Tel: 043-250-1674

You can see a sample of digital storytelling at this QR code or access from the address below
https://www.youtube.com/watch?v=WxHaP-Zy2_0

Japanese digital storytelling Hiromi Tel: 043-250-1674 hiromi.nishioka@students.mq.edu.au

Appendix 4: Participant information and consent form for the participants (1)

Department of Linguistics
Faculty of Human Sciences
MACQUARIE UNIVERSITY NSW 2109
Phone: 9850 8756

Chief Investigator's name: Professor Phil Benson (Primary supervisor), Nishioka Hiromi (a Ph.D. candidate)

Participant Information and Consent Form

Name of Project: Digital storytelling in Japanese

You are invited to participate in a study of digital storytelling in Japanese. The purpose of this study is to identify the value of digital storytelling in Japanese language education. Ms. Nishioka (Phone: 043-250-1674, Email: hiromi.nishioka@students.mq.
edu.au) will conduct this research to meet the requirements for Doctor of Philosophy under the supervision of Professor Phil Benson (Phone: 9850 8756, Email: philip.benson@mq.edu.au) of the Department of Linguistics.

As a participant, the researcher will ask you to
1) participate in 12 hours data collection in total and
(You can choose to attend either 2 full day workshops and 2 interviews or weekly workshop with an interview over 6 weeks. The duration of both data collection is approximately 12 hours in total.)
2) answer a pre-project and a post-project questionnaire and
4) create a digital story related to culture or other topics you are interested in either in pair or in group and
5) permit the researcher to upload your digital story to upload to Youtube (https://www.youtube.com/) and Ameba (http://www.ameba.jp/) and
6) submit digital contents in case you create in Japanese after the project.
*Data collection will not be conducted 2 weeks before final exam period.
*Your name and images will not be included in the digital story.

By participating in this study, you can
1) improve your Japanese proficiency
2) receive a $200 Kinokuniya book store gift card when you complete the 6 week-project and
3) optionally receive free Japanese conversation lessons
(I will provide free Japanese lessons up to 3 hours for group lessons. If you wish to have private lessons, the lessons hours will be divided by the number of the group members. You can choose styles and contents of lessons depending on your preference.)

Any information or personal details gathered in the course of the study are confidential, except as required by law. Your participation in workshops will be video/audio recorded, and interviews will be recorded by audio recorders for further analysis. These recorded data and transcriptions will be seen only by the researcher and her supervisor, Professor Phil Benson. The researcher will use pseudonyms when she publishes the findings of this study in

conferences and academic publications. Digital stories that you create in a group at workshop will be uploaded to Youtube (https://www.youtube.com/) and Ameba (http://www.ameba.jp/) to receive feedback from an audience online. To protect your privacy, the researcher will ask you not to present your face and name in digital storytelling. In case you create digital contents in Japanese after the project, you will be asked to submit to the researcher for further analysis. You can choose which samples you submit, and you can erase a part of data such as personal information in the contents. A summary of the findings of the study can be made available to you on request by sending e-mail to the researcher (Nishioka Hiromi: Hiromi.nishioka@students.mq.edu.au)

Participation in this study is entirely voluntary: you are not obliged to participate and if you decide to participate, you are free to withdraw at any time without having to give a reason and without consequence. This project is not a credited course at Macquarie University, therefore, your participation to this project does not impact on your credit or grade.

I, ( ) have read and understand the information above and any questions I have asked have been answered to my satisfaction. I agree to participate in this research, knowing that I can withdraw from further participation in the research at any time without consequence. I have been given a copy of this form to keep.

Participant's Name:_____
(Block letters)

Participant's Signature: _____ Date:_____

Investigator's Name:_____
(Block letters)

Investigator's Signature: _____ __ Date:_____

The ethical aspects of this study have been approved by the Macquarie University Human Research Ethics Committee. If you have any complaints or reservations about any ethical aspect of your participation in this research, you may contact the Committee through the Director, Research Ethics & Integrity (telephone (02) 9850 7854; email ethics@mq.edu.au). Any complaint you make will be treated in confidence and investigated, and you will be informed of the outcome.

(PARTICIPANTS' COPY)

Appendix 5: Participant information and consent form for the participants (2)

Department of Linguistics
Faculty of Human Sciences
MACQUARIE UNIVERSITY NSW 2109
Phone: 9850 8756

Chief Investigator's name: Professor Phil Benson (Primary supervisor), Nishioka Hiromi (a Ph.D. candidate)

Participant Information and Consent Form

Name of Project: Digital storytelling in Japanese

I would like to obtain permission from you to include data you have agreed to provide for the purpose of further analysis during the project in my future publications (Ph.D. thesis, books, academic journal articles, workshops, and conferences).

Consented data use
You have agreed to provide data during the project for the purpose of further analysis, including 1) video/audio recordings during the project; 2) audio recordings of interviews. However, the student researcher has not obtained permission from you to include a part of the recordings and screen captures of the video recording images in her future publications. Therefore, the student researcher requests you to permit to include 1) the video/audio recordings; 2) screen captures of the video images in her future publications (Ph.D. thesis, books, academic journal articles, workshops, and conferences).

Further use of the data
A part of video and audio recording segments, screen-captures of the video recordings, which you have provided to the student researcher will be published in the forms of Ph.D. thesis, books, academic journal articles, workshops, and conferences. However, to protect your privacy, only a part of the images and the recording segments directly related to the research purposes will be extracted and published. In the publications, pseudonym will be used and your face in the video recordings and the images will be edited as blurred or coloured with black to maintain your anonymity.

Benefits of including the data in publications
Inclusion of the multimodal data (the video/audio recordings and screen captures of the video recordings) provides rich data beyond descriptions that written words can solely accomplish: The potential audience and readers can visualise the actual learning contexts vividly by seeing and hearing interactions you have developed with your peer. Consequently, the multimodal data enhances their comprehension of learning process you have engaged with your peer during the projects.

I, ( ) have read and understand the information above and any questions I have asked have been answered to my satisfaction. I agree to participate in this research, knowing that I can withdraw from further participation in the research at any time without consequence. I have been given a copy of this form to keep.

Participant's Name:_____
(Block letters)

Participant's Signature: _____ Date:_____

Investigator's Name:_____
(Block letters)

Investigator's Signature: _____ __ Date:_____

The ethical aspects of this study have been approved by the Macquarie University Human Research Ethics Committee. If you have any complaints or reservations about any ethical aspect of your participation in this research, you may contact the Committee through the Director, Research Ethics & Integrity (telephone (02) 9850 7854; email ethics@mq.edu.au). Any complaint you make will be treated in confidence and investigated, and you will be informed of the outcome.

(PARTICIPANTS' COPY)

Appendix 6: Background questionnaire
Participants data Part 1.

Name			
Phone		Email	
birthday	Month Day, Year		
Nationality	1. Born and grew up in Australia 2. Immigrated to Australia (when you immigrated) (how long you lived in Australia) 3. International student (when you came to Australia) (how long you lived in Australia)		
First language			
Language you have learned	Language	Length of study Institution	Proficiency level
	EX) Japanese	3 years in high school 2 years in university	Passed N2 in JLPT, 2014 I prepare to take N1 this year

University name		Major		Year	
Japanese subjects you enrol this semester		Students who do not enrol in Japanese this semester Provide courses you have enrolled in your university before	

Experiences to create digital contents in Japanese class	Circle every applicable activities you engage in Japanese in Japanese class 1. None of them 2. Write Blog, 3. Edit wiki, 4. Create video (only create, share with audience online) 5. Create audio files (only create, share with audience online) 6. Upload written messages to SNSs, 7. Leave comments in websites such as Youtube excluding learning management system in your university 8. Upload audio recordings to learning management system in your university 9. Upload written assignments such as short essay to learning management system in your university 10. Participate in discussion or provide feedback in learning management system at your university 11. Other (please explain)

Experiences to create digital contents in your first language in your leisure time	Circle every applicable activities you engage in your first language in your leisure time 1. None of them 2. Write Blog, 3. Edit wiki, 4. Create video (only create, share with audience online) 5. Create audio files (only create, share with audience online) 6. Upload written messages to SNSs, 7. Leave comments in websites such as Youtube excluding learning management system in your university 8. Other (please explain)
Experiences to create digital contents in Japanese in your leisure time	Circle every applicable activities you engage in Japanese in your leisure time 1. None of them 2. Write Blog, 3. Edit wiki, 4. Create video (only create, share with audience online) 5. Create audio files (only create, share with audience online) 6. upload written messages to SNSs, 7. Leave comments in websites such as Youtube excluding learning management system in your university 8 . Other (please explain)

Participants data Part 2

Workshop

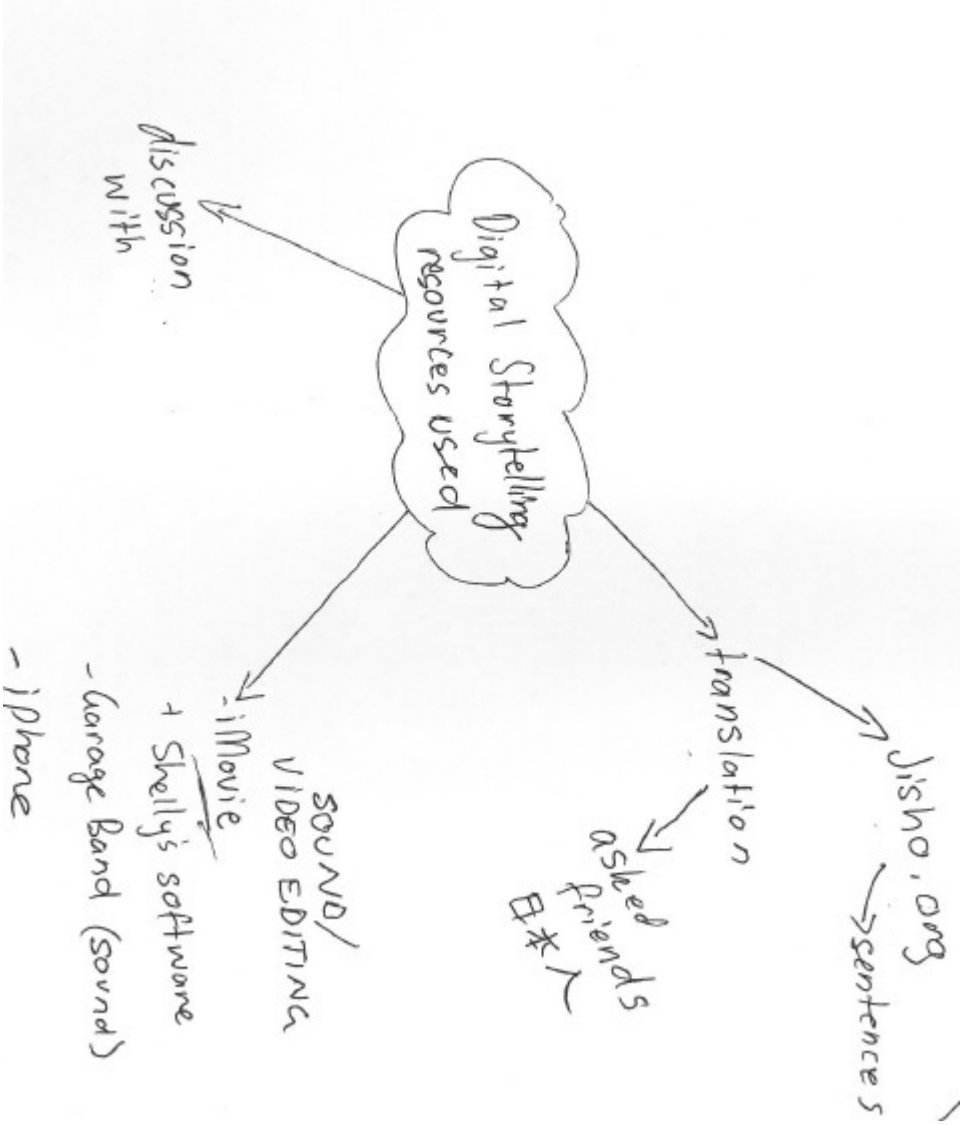
Possible type	Circle every choice applicable to you 1. Two full day workshop + two interviews in separate day 2. Weekly 2 hour workshop + interview

Circle every time slot available to participate in the study so that I can fit your schedule with other learners' ones.

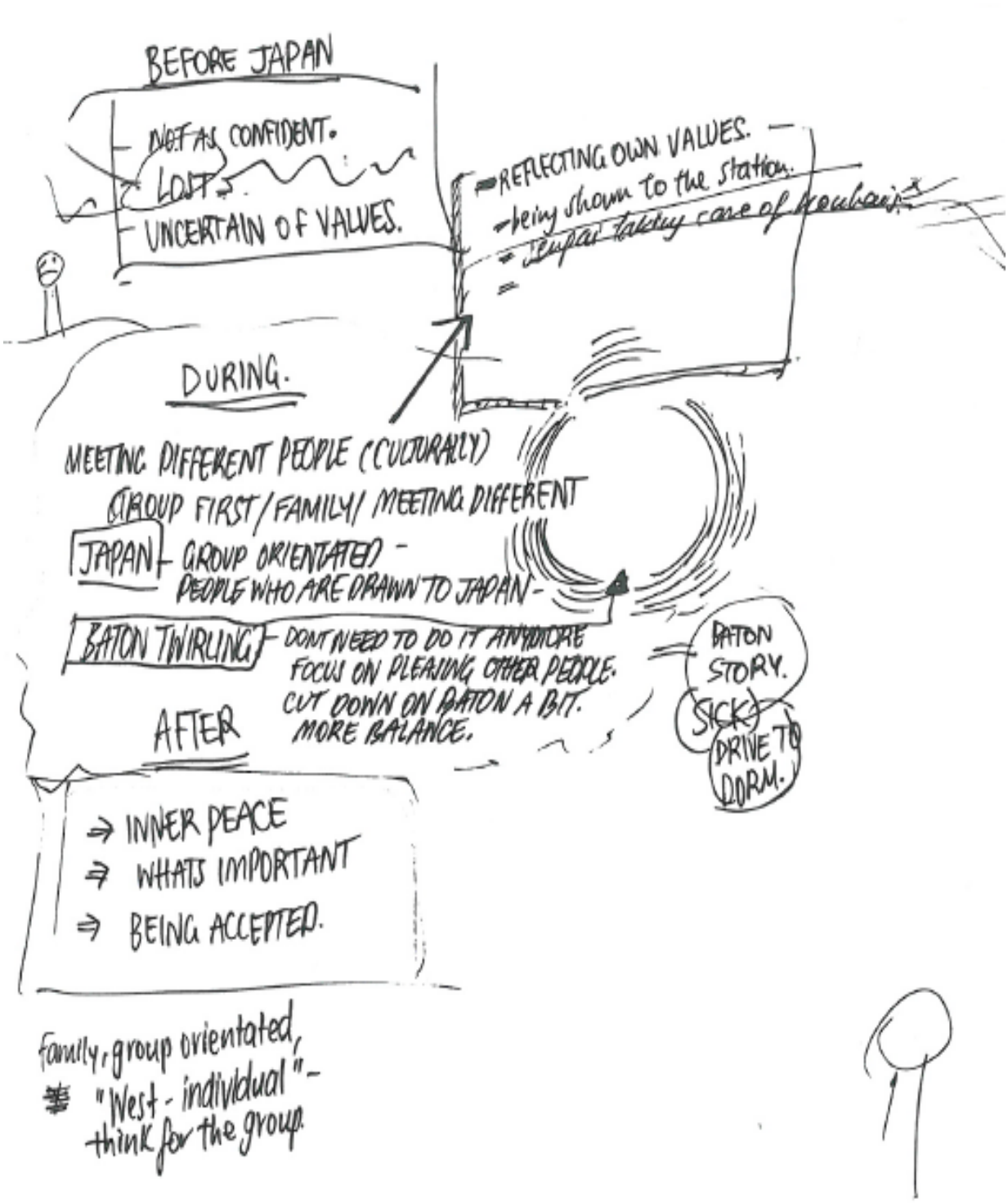
	10-12am	1-3pm	3-5pm	5-7 pm
Mon				
Tus				
We				
Thur				
Fri				
Sat				
Sun				

Appendix 7: A mind-map drawn by the participants during sessions
Drawn by Lucie (Pair 5) during topic development stage

Appendix 8: A Mind-map drawn during semi-structured interviews
Drawn by Stephanie



Appendix 9: A graphic organiser
Drawn by Lucie (Pair 5) during topic development stage



Appendix 10: An outline written by Jiyoung (Pair 6) during writing stage
(To write their script, Jiyoung developed an outline as a script by adding sentences to the outline. She used English to clarify what they will discuss in the section.)

Intro (30 sec)

Video Title (3 sec)
あなたにとって、オーストラリアはどんな国ですか。(subtitle) 4-5 sec

------ Spirited Away
じつは、テレビで見たオペラハウスやハーバーブリッジみたいな
有名なところがオーストラリアのすべてではないです。
オーストラリアは多文化社会なんです。
人たちがいろんな食べ物やレジャーを楽しんで生きられる社
では、私たちと一緒に、この新しいオーストラリアを探しに

Jiyoung wrote their script by adding Japanese sentences to their outlines

Body

English is used to list their ideas

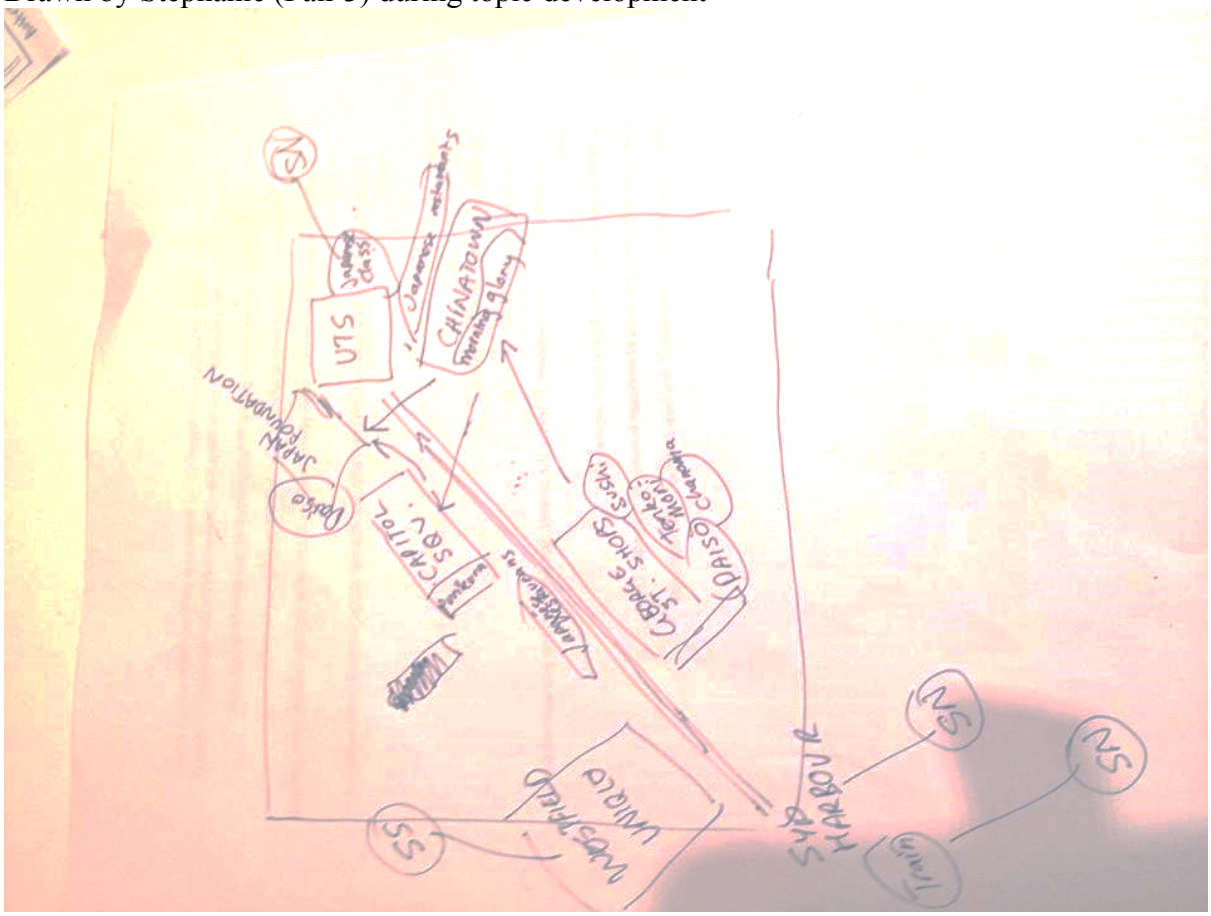
1. 人たち
   - Introducing different types of people
   - Historical perspective (Colonisation – Aboriginal people/Western Culture; Gold Rush – Chinese/Asian Culture people; Migration)
   - More accepting various culture
     ○
2. 食べ物
   - Wherever you go/ wherever you are from you can enjoy different types of food (Many restaurants in Australia)
   - Anyone is free to try/ different foods
   - Australia is the first one which has so many types of food
     ○
3. レジャー
   - Going to a pub/bar
   - Surfing/going to the beach
   - Barbeques
   - It caters for all ages
     - Summing up body : You won't feel left out (オーストラリアに来たら、外国人だと思われません。ここで、みんなは一緒ですから。)

Conclusion (30 sec)

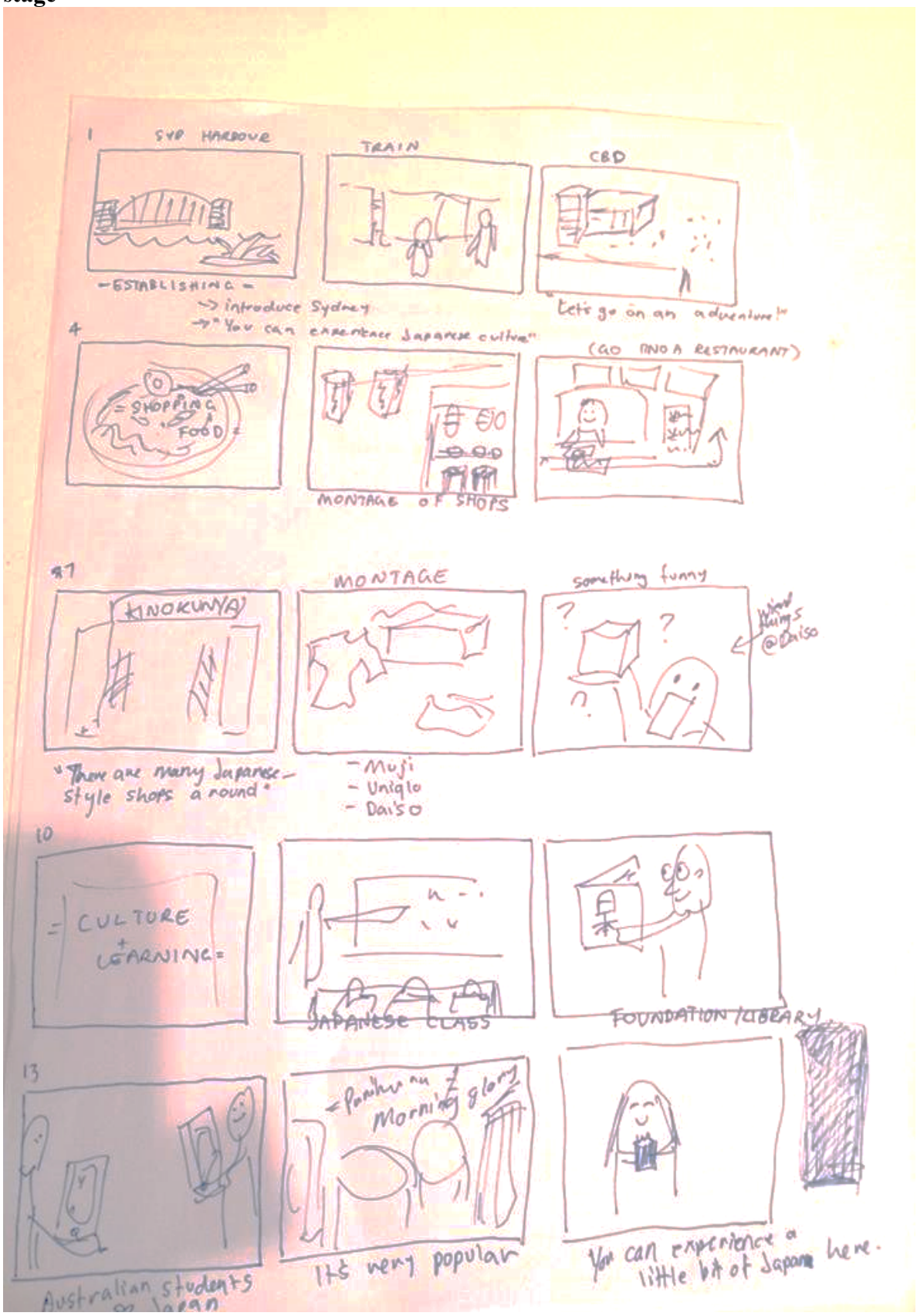
このビデオを見てから、あなたにとって、オーストラリアはどんな国ですか。
これは、オーストラリアの全てではありません。一つの部分だけですから。
Summing up
まだ残っているオーストラリアっていう冒険を（一緒に）しませんか。

Appendix 11: A map by Pair 3 (Stephanie/Sherry) to discuss locations they go out for shooting video clips

Drawn by Stephanie (Pair 3) during topic development



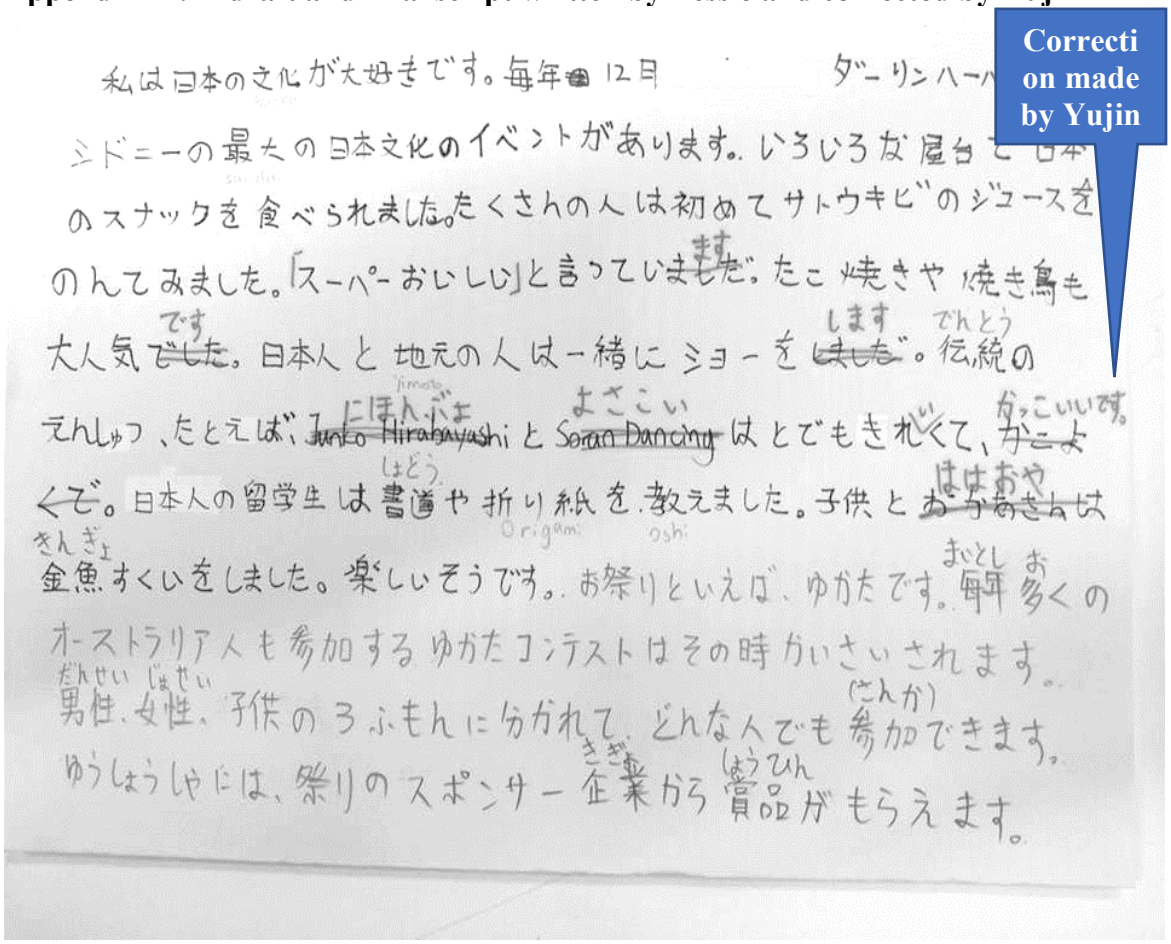
Appendix 12: A storyboard drawn by Stephanie (Pair 3) during topic development stage



Appendix 13: Websites the participants used during the project
A website that Lucie shared with Yuki to discuss their story structure during topic development
http://io9.gizmodo.com/5916970/the-22-rules-of-storytelling-according-to-pixar)

Pages 467-469 of this thesis ("The 22 rules of storytelling, according to Pixar") have been suppressed due to copyright restrictions. The suppressed text can be found at the above web address.

Appendix 14: A draft and final script written by Tessie and corrected by Yujin



Translation for above script by the researcher
(I translate above script based on Tessie's original sentences. She inappropriately used past form to describe characteristic of a Japanese festival held every year. Yujin corrected her script with present form.)

I like Japanese festival. Every year in December, Daring Harbour has largest Japanese festival in Sydney. (We) could eat many Japanese snacks at various street venders. Many people tried to drink sugar cone juice for first time. (They) said super tasty. *Takoyaki, yakitori* was very popular. Japanese and local people did show together. Traditional rendering, for example, '*nihon Buyo'*(classic Japanese dancing), '*Yosakoi*'(Japanese dancing for festival), were beautiful and cool. Japanese international students taught calligraphy and paper crafts. Children and mother did gold fish scoping. I have heard it was interesting. Speaking of festival, (it reminds us) '*yukata*'(cotton kimono for summer). Every year, Yukata festival which many Australian participates are held. It has categories for men, women, and children, anyone can participate. A first winner can receive gifts from sponsors.

Appendix 15: Revision history of Google Docs
A part of revision history of script written by Pair 3 (Sherry/Stephanie)

Revision history 1 (April 27, 2016)
(First Sherry and Stephanie completed different sections at the same time by using capability of Google Docs to edit the same document by multiple users synchronous and asynchronously.)

Time	Location/Scene	English	Japanese
	Title: Culture & Learning	**TITLE: Culture & Learning**	SUBTITLE：文化 と言語
	Japanese class	*(diegetic dialogue)* Learning Japanese has become more popular. Many young people are interested in Japanese culture and want to be able to speak the language. Young people are eager to go overseas	Written by Stephanie オーストラリアに盛んになる わかもの若者は、がいこく外国にい行きたがる。
	Japan Foundation Library	Japanese students often come to study at the Japanese Foundation Library because there are many resources here. Many Japanese people also come here to borrow Japanese newspapers and books.	日本語を勉強する学生はよく国際交流基金で勉強をしに行きます。たくさん日本語の本や勉強の資料があるおかげで学生にとしてとてもいい場所なのです。 でもここは日本人にも人気なところであります。新聞や諸説を借りるために来る日本人は他の日本人と会ったり、話したりしながら自分のすじょうを感じることができます。

Written by Sherry

Revision history 2 (April 27, 2016)

(Sherry completed their script by revising sentences written by Stephanie and writing uncompleted sections by her).
(Green=Written by Stephanie, Yellow=Edited by Sherry)

	Title~~:~~ ~~Culture & Learning~~	**TITLE: Culture & Learning**	**SUBTITLE: 文化 と言語**
	Japanese class	*(diegetic dialogue)* **SHELLY:** Learning Japanese has become more popular. Many young people are interested in Japanese culture and want to be able to speak the language. **SHELLY:** Young people are eager to go overseas	そして、オーストラリアには日本語を勉強することは最も盛ん~~になる~~でいることになっています。若い人はとくに日本の文化に興味があって、日本についてもっと悔しくわかるように一生懸命勉強します。 ~~わかもの若者は、がいこく外国にい行きたがる。~~そのおかげで、海外に行って、「日本」をちゃんと経験したい若者も増えてきました。
	Japan Foundation Library	**STEPH:** Japanese students often come to study at the Japanese Foundation Library because there are many resources here. **SHELLY:** Many Japanese people also come here to borrow Japanese newspapers and books.	日本語を勉強する学生はよく国際交流基金で勉強をしに行きます。たくさん日本語の本や勉強の資料があるおかげで学生にとしてとてもいい場所なのです。 でもここは日本人にも人気なところであります。新聞や諸説を借りるために来る日本人は他の日本人と会ったり、話したりしながら~~自分~~自分の国にいなくても~~の~~すじょうを感じる~~が~~もできます。

Sherry revised sentences written by Stephanie adding the in-depth descriptions.

Revision history 3 (May 10, 2016)
(Sherry revised their script outside the writing session by incorporating feedback provided by Japanese members of Lang-8 (http://lang-8.com/)

Time	Location/Scene	English	Japanese
	Title: Culture & Learning	**TITLE: Culture & Learning**	**SUBTITLE: 文化 と言語**
	Japanese class	*(diegetic dialogue)* **SHELLY:** Learning Japanese has become more popular. Many young people are interested in Japanese culture and want to be able to speak the language. **SHELLY:** Young people are eager to go overseas	そして、オーストラリア~~に~~では、日本語を勉強すること~~は~~が年々盛んでいることになっています。とくに、若い人は~~とくに~~日本の文化に興味があって、日本~~を~~について、もっと~~悔~~くわしく~~わか~~なるように~~（？？）~~一生懸命勉強しています。 **Sherry revised sentences by incorporating suggestions provided by Japanese members of Lang-8.** その理由で、~~海外~~日本に行って、実際に自分で「日本~~」~~」~~を~~の文化を~~ちゃんと~~経験したい若者も増えてきました。
	Japan Foundation Library	**STEPH:** Japanese students often come to study at the Japanese Foundation Library because there are many resources here. **SHELLY:** Many Japanese people also come here to borrow Japanese newspapers and books.	日本語を勉強~~する~~している学生はよく国際交流基金~~で~~に勉強しに行きます。たくさん日本語の本や勉強~~の~~に役に立つ資料がある~~おかげ~~ので、学生に~~として~~とってとてもいい場所です。 でもそこは日本人にも人気~~な~~が~~ところで~~あります。新聞や小説を借りるために来る日本人は他の日本人と会ったり、話したりすることで~~しながら~~、自分の国にいなくても個人のアイデンティティを忘れずに、日本とのつながりを強く保つすることができます。

Appendix 16: Coding matrix emerged from the first coding procedure (Task and role allocation)

To code task and role allocation for each production stage, I used the following coding categories.

Coding categories	**Descriptions**
Pattern A: the same task and the same role	Each learner works on the same part of their task by playing in the same role
Pattern B: the same task and the different roles	Each learner works on the same task but plays different roles
Pattern C: different tasks and the same role	Each learner works on different tasks by playing the same role
Pattern D: different tasks and different roles	Each learner works on different tasks by playing different roles.

(Coding matrix emerged from the first coding procedure is presented in next page.)

(Continued from previous page)

Coding matrix emerged from the first coding procedure

		Task and role allocation		
		1. Develop a story	**2. Write a script**	**3. Modify the script**
1. Division of labour	Pair 1 Tessie/Yujin	C	Home: C Session: D	Script Tessie has written at home: D Conclusion: B
	Pair 2 Kasumi/Sky [59]	A	English= D Japanese= C	B
	Pair 3 Sherry/ Stephanie[60]	A	English= B Japanese =D	D
	Pair 4 Brian/Po[61]	A	D	D
2. Collaborative storytelling	Pair 5 Lucie/Yuki[62]	A & C	C	English= B Japanese= C
3. Collaborative knowledge constructions	Pair 6 Jiyoung/ Walter	B	B	B
4. Limited spoken communication	Pair 7 Rena/ Rita[63]	A	Before session=D During session= B	B

[59] Pair 2 (Kasumi/Sky) wrote and modified their English script outside the project. Therefore, I do not have any record of TMEs and LREs while they were writing and modifying an English script.
[60] Pair 4 (Sherry/Stephanie) first wrote an English script, and translated it to Japanese. They only revised Japanese script, so I do not have any record of TMEs and LREs while they were modifying an English script.
[61] I included the number of TMEs and LREs which Po initiated while Brian was still writing their script to ones during writing stage. I excluded the number of TMEs and LREs they produced while discussing how to integrate feedback from Japanese from data as the participants in Phase 1 did not have the same session.
[62] Pair 5 (Lucie/Yuki) completed their English script at home, so I do not have any record of TMEs and LREs while they were writing an English script. They revised their Japanese script at home, I do not have any record of TMEs and LREs while they were modifying Japanese script.
[63] I excluded the number of TMEs and LREs they produced while discussing how to integrate feedback from Japanese from data as the participants in Phase 1 did not have the same session.

Appendix 17: Coding matrix emerged from second coding procedure

E=English script, J=Japanese script

		1. Develop a story		2. Write a script		3. Modify the script[64]		Total of TMEs and LREs	
Patterns	**Pair**	**TMEs**	**LREs**	**TMEs**	**LREs**	**TMEs**	**LREs**	**TMEs**	**LREs**
1. Division of labour	Pair 1 Tessie/Yujin	17	1	15	6	12	6	44	13
	Pair 2 Kasumi/Sky	52	0	E=0 J=1	E=0 J=0	E=0 J=5	E=0 J=22	58	22
	Pair 3 Sherry/Stephanie	88	0	E=48 J=8	E=0 J=5	E=0 J=7	E=0 J=2	151	7
	Pair 4 Brian/Po	190	12	71	13	0	0	261	25
2. Collaborative storytelling	Pair 5 Lucie/Yuki	429	9	E=0 J=5	E=0 J=19	E=102 J=0	E=0 J=0	536	28
3. Collaborative knowledge constructions	Pair 6 Jiyoung/Walter	136	25	149	43	99	25	384	93
4. Limited spoken communication	Pair 7 Rena/Rita	17	0	18	2	12	2	47	4

[64] Although Pair 4 and Pair 7 who participated in Phase 2 of my PhD study discussed how to revise their script after they receive feedback from Japanese. However, other five pairs did not have the session. Therefore, I only counted TMEs and LREs Pair 4 and 7 have discussed their revision prior to receive feedback from Japanese.

Appendix 18: Task procedures (Pair 1: Tessie/Yujin)

Session	Task	Time (minutes)	Activities
Session 1	Decide their topic	10 minutes	They discussed topic for their digital story together for ten minutes.
Outside the session	Research their topic	No time record	They researched topic for their sections indivisually by searching websites.
Outside the session	Write a script	No time record	Yujin completed to write all of her section (SMASH!) at home. Tessie completed a part of her section (traditional festival) at home.
Session 2-1	Write a script	65 minutes	Tessie completed her remaining part. Yujin completed introduction and conclusion, corrected Tessie's paper script. She also provided Tessie suggestions for their task procedures as well as Japanese expressions.
Session 2-2	Revise their script	25 minutes	Tessie advised Yujin how to modify their introduction and conclusion written by Yujin.
Outside the session	Find images	No time record	They searched images they would use for their digital story.
Session 3-1	Develop a storyboard	74 minutes	They shared images they found at home and decide which images they include in their digital story. They completed their storyboard.
Session 3-2	Practice editing with iMovie	56 minutes	They practiced to edit a video clip using iMovie, a storyboard, a sample video and an instruction video.
Outside the session	Prepare for editing	No time record	They recorded their narration, and found music for their digital story individually.
Session 4	Edit a digital story	149 minutes	They edited their section by taking turns. When one participant edited her section, another participant monitored the process and provided suggestions.

Appendix 19: Task procedures (Pair 2: Kasumi/Sky)

Session	Task	Time (minutes)	Activities
Outside the session	Develop a story	No time record	They voluntarily discussed topic for their digital story outside the session.
Session 1	Develop a story	14 minutes	They reported theme of their digital story and the task procedures to the researcher.
Session 2	Develop interview questions	29 minutes	They developed questions they interviewee to Japanese.
Outside the session	Interview to Japanese friends	No time record	Sky interviewed to his Japanese friends studying at his university about their perceptions and experiences of living and studying in Australia.
Outside the session	Write an English script	No time record	Kasumi wrote an English script based on the interview data.
Outside the session	Provide feedback to an English script	No time record	Sky provided feedback on Kasumi's English script by talking via Facebook chat.
Session 3-1	Write a Japanese script	44 minutes	They wrote a Japanese script for their sections individually in papers for 44 minutes without interacting each other.
Session 3-2	Read a script to provide feedback	16 minutes	They read script written by peers for 16 minutes to provide feedback.
Session 3-3	Modify the script	10 minutes	They provided feedback each other by taking turns. Kasumi provided 20 suggestions, whereas Sky provided only 2 suggestions to her.
Outside the session	Receive feedback from Japanese friends	No record	They received feedback from Japanese friends and modified their script based on their suggestions. Sky received feedback by meeting his friends in face-to-face, whereas Kasumi received feedback by interacting with her Japanese friend in Japan by text-chatting via Facebook in a real-time.
Session 4	Discuss images	77 minutes	They discussed what images they will use for each section.
Outside the session	Prepare for editing	No time record	They recorded their narration, and found images and music for their digital story individually.
Session 5	Edit a digital story	266 minutes	While Sky was editing a video clip, Kasumi completed multiple tasks; 1) editting sound files; 2) creating Japanese telop using Google Translate. Kasumi also took a role to provide feedback on Sky's video editing style.

Appendix 20: Task procedures (Pair 3: Sherry/Stephanie)

Session	Task	Time (minutes)	Activities
Session 1	Develop a story	12 minutes	They discussed overall topic (4 minutes) and the task procedures (8 minutes).
Session 2-1	Develop a story	32 minutes	They further discussed topic and the task procedures together.
Session 2-2	Write an English script	20 minutes	They wrote an English script by taking different roles: Stephanie spoke narration in English, Sherry typed the narration by slightly revising it.
Session 2-3	Write a Japanese Script	22 minutes	They rewrote different parts of their English script in Japanese synchronously by using Google Docs. Sherry helped to complete their script by revising sections written by Stephanie.
Session 2-4	Modify the script	35 minutes	Sherry revised their Japanese script, whereas Stephanie looked for their music.
Outside the session	Modify the script	No time records	Sherry modified their Japanese script by incorporating suggestions from Japanese native speaker members of Lang-8 (http://www.lang-8.com/).
Outside the session	Prepare for editing	No time record	They recorded their narration, and found images and music for their digital story individually.
Session 3	Edit a digital story	154 minutes	While Sherry was editing their digital story, Stephanie looked for their music and provided advice to Sherry.
Session 4	Edit a digital story	76 minutes	Sherry consulted her editing problems with Stephanie, Stephanie provided suggestions for 28 minutes. Sherry went back to her editing task. While waiting for Sherry, the researcher arranged an interview with Stephanie.
Session 5	Edit a digital story	122 minutes	While Sherry was editing their digital story, Stephanie provided feedback on Sherry's video editing style.

Appendix 21: Task procedures (Pair 4: Brian/Po)

Session	Task	Time (minutes)	Activities
Session 1	Develop a story	74 minutes	They discussed overall topic together.
Session 1-1	Develop interview questions	8 minutes	They developed questions to interview to Japanese friends.
Outside the session	Interview to Japanese friends	No time record	They interviewed to Japanese friends studying at their university to incorporate their perspectives in their story.
Session 2-1	Develop a story	22 minutes	They shared what their Japanese friends commented during the interviews, and discussed which commemnts they would include in their digital story.
Session 2-2	Develop a story	44 minutes	They wrote an outline by discussing contents and images they would use in their digital story.
Session 3-1	Develop a story	16 minutes	They reviewed overall structure of their story before starting to write.
Session 3-2	Write their script /Modify script	121 minutes	They wrote their script in Japanese by using Google Docs. They allocated few lines each as they complete their previous lines. Po modified their Japanese script, while Brian was writing his lines. Brian wrote down what he would write for some lines in English. Therefore, Po helped to complete several Brian's lines, while Brian was away to have a break.
Outside the session	Received feedback from Japanese friends	No time record	They received feedback to their script from their Japanese friends
Session 4-1	Modify the script	20 minutes	They discussed how they modified their Japanese script based on feedback from their Japanese friends.
Session 4-2	Search images	41 minutes	They individually searched images they would use in their digital stories.
Outside the session	Prepare for editing	No time record	They recorded their narration together, and searched music individually.
Session 5	Edit a digital story	59 minutes	Po took an editing role, whereas Brian provided feedback on Po's video editing style.
Session 6	Edit a digital story	171 minutes	Po edited a video clip, whereas Brian provided feedback on Po's video editing style in addition to edit their narration.
Outside the session	Edit a digital story	No time record	Po continued to refine the video editing at home.

Appendix 22: Task procedures (Pair 5: Lucie/Yuki)

Session	Task	Time (minutes)	Activities
Session 1-1	Brainstorm episodes	13 minutes	They brainstormed episodes for own sections individually by drawing a mind-map.
Session 1-2	Develop a story	109 minutes	They shared episodes each other to receive feedback and to choose the best episode for each season.
Session 2-1	Develop a story	123 minutes	They discussed their storyline for own sections together while writing their storyline. They also frequent interrupted each other while writing to receive feedback on their section or to discuss how to connect individual episodes together as a story.
Session 2-2	Develop a storyboard	16 minutes	They developed a storyboard together.
Session 2-3	Develop a story	11 minutes	They discussed how to end their story together, and wrote down their storyline.
Outside the session	Complete an English script	No time record	They completed the rest of their English script individually at home. They submitted their script to the researcher 4 days after the session.
Session 3-1	Modify an English script	66 minutes	They discussed how to trim down their English scripts by looking at Lucie's laptop together, and modified them together. Yuki typed their decision using Lucie's computer.
Session 3-2	Translate into Japanese	71 minutes	They translated own sections into Japanese individually at the same time. Lucie completed remaining sections at home.
Session 3-3	Practice and record narration	17 minutes	They practiced narration of their introduction. They recorded it with a mobile phone, and listened to the recordings to see how their narration sounds.
Outside the session	Translate and revise script	No time record	They completed the rest of their translation and revised Japanese script individually at home.
Outside the session	Receive corrections from a Japanese	No time record	They asked the researcher to modify their script, and the researcher helped to do so.
Outside the project	Prepare for editing	No time record	They went out for shooting their introduction and conclusion. They recorded narration of own sections indivisually.
Outside the session	Edit digital story	No time record	Lucie first completed to edit her section of their digital story at home, and then shared it with Yuki so that Yuki could edit her section using a consistent video editing format.

Appendix 23: Task procedures (Pair 6: Jiyoung /Walter)

Session	Task	Time (minutes)	Activities
Session 1-1	Develop a story	18 minutes	They discussed their story together.
Session 2	Discuss music	8 minutes	Jiyoung showed sample music she has edited to discuss how to edit music file with Walter.
Session 2-1	Develop a story	102 min	They discussed how to structure their story together by drawing an outline.
Session 2-2	Show editing applications	18 minutes	Jiyoung showed editing applications to Walter in order to discuss their editing styles.
Session 3-1	Develop a story	7 minutes	They discussed their storyline before started to write their script. They wrote their outline by mixing English and Japanese.
Session 3-2	Write a script	193 minutes	They wrote their Japanese script together by discussing both in English and Japanese. Jiyoung typed their script based on their discussion.
Session 4-1	Share an editing application	4 minutes	Jiyoung shared video applications to Walter so that Walter could visualise the editing effects they could achieve using the applications.
Session 4-2	Revise a script	95 minutes	They discussed and revised their script together.
Session 4-3	Developed a storyboard	117 minutes	They discussed how to structure their story by developing a storyboard together.
Outside the session	Prepare for editing	No time record	They searched images they wish to use in their digital story, they also recorded their narration.
Session 5-1	Edit sound / practice and record narration	179 minutes	Jiyoung monitored while Walter was practicing and recording his narration, and provided suggestions to him.
Session 5-2	Discuss how to edit a digital story	56 minutes	Jiyoung showed editing software to Walter, and they discussed which video editing styles they would use in their digital story.
Outside the session	Received corrections from a Japanese	No time record	They requested the researcher to modify their script, so the researcher helped to do so.
Outside the project	Record narration	No time record	As Walter was not satisfied with the quality of his narration recorded during Session 5, he re-recorded his narration at home.
Outside the project	Edit a digital story	No time record	Jiyoung edited their digital story at home by herself based on the discussion she had with Walter during Session 5.

Appendix 24: Task procedures (Pair 7: Rita/Rena)

Session	Task	Time (minutes)	Activities
Session 1-1	Develop a story	30 minutes	They discussed their story in Japanese by browsing Internet together using a computer and shared screen in a group study room.
Session 1-2	Develop interview questions	9 minutes	They developed questions they will ask to their Japanese friends via online survey.
Outside the session	Distribute online survey and analyse the results	No time record	Rita distributed online survey to her Japanese friends, and received the results. She read the summary of the results to analyse the data.
Before Session 2	Write a script	No time record	Rena voluntarily completed first half of their script while she was waiting for Rita who was interviewed by the researcher.
Session 2	Write a script	65 minutes	First Rena read aloud the script she has completed by herself to share it with Rita. They then started to write remain of their script in Japanese. Rena controlled their writing process by rejecting Rita's suggestions and by deciding what to include in their story. Therefore, Rita decided to take an alternative role; to look for information that Rena could include in their script using own her laptop.
Session 3	Modify their script	31 minutes	They modified their script by discussing together. Rena revised it based on their discussion.
Outside the session	Receive feedback from a Japanese friend	No time record	Rita received feedback to their script from her Japanese friend by text-chatting via Facebook chat in real time.
Session 4	Modify the script	161 minutes	The pair first read written feedback to their script from Rita's friend, and discussed how to modify their script. Rena helped to type the revision.
Session 5	Edit a digital story	103 minutes	Rita observed while Rena was editing their digital story.
Outside the session	Edit a digital story	164 minutes	Rena completed to edit their digital story at home.