

TRANSFORMATIVE LEARNING AND TEACHING IN ECONOMICS

- **THE ‘*WHY*’ OF LEARNING AND TEACHING ECONOMICS USING THRESHOLD CONCEPTS**
- **THE ‘*HOW*’ OF LEARNING AND TEACHING ECONOMICS USING LEARNING TAXONOMIES**

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Declaration

I certify that the work in this thesis entitled “Transformative Learning and Teaching Economics” has not previously been submitted for a degree nor has it been submitted as part of requirements for a degree or diploma to any other university or institution other than Macquarie University.

I also certify that the thesis is an original piece of research and it has been written by me. 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. Any help and assistance that I have received in my research work and the preparation of the thesis itself have been appropriately acknowledged.

In addition, I certify that all information sources and literature used are indicated in the thesis.

The research presented in this thesis was approved by Macquarie University Ethics Review Committee as follows:

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... everyone who is fully trained will be like their teacher.

– St. Luke

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Thesis abstract

When economics is a core course for all students in a business faculty, the result is a diverse cohort. Students need to be conveyed the ‘*why*’ and the ‘*how*’ of learning economics to ensure that the course is relevant, interesting and engaging. Students need to be equipped with transformative concepts that they can integrate into their own discipline and beyond university. This study investigates these motivations in a core microeconomics course of a large business faculty in an Australian university.

To emphasise the ‘*why*’ of learning, this study frames a teaching methodology based on research into threshold concepts – emphasising the transformative and integrative ideas of economics. To incorporate the ‘*how*’ of learning, this study develops a systematic pedagogy based on learning taxonomies – navigating students from base-level learning to evaluative and critical thinking in economics.

This is the first study that engages all the threshold concepts of economics in a single curriculum, to engage students with the ‘*why*’ of learning. This is also the first study that engages the threshold concepts of economics throughout the curriculum – in every learning and teaching activity, as well as in every assessment task. Without altering the content, this study also develops a transformed ordering of topics to create a unique teaching sequence based on the threshold concepts of economics.

To assist students with the ‘*how*’ of learning economics, this study utilises assessments *for* learning rather than assessments solely *of* learning. This study develops an original *R.E.A.L. framework* – a four-step scaffolding to engage and equip learners with evaluative and critical thinking in economics. The *R.E.A.L. framework* is useful for teachers as well, assisting teachers to guide their students to higher level thinking in economics.

Student surveys noted a significant improvement in the student learning experience. The course grades noted a significant improvement in student learning outcomes.

Introductory chapter

Introductory chapter part 1 of 2

– introduction, literature review, and motivation

This introductory chapter draws upon the rest of this thesis to convey the coherence and integration of all the chapters which focus on a single project with related questions and propositions.

The discipline of economics, like other disciplines is now catering to an ever-diversifying student cohort each decade (Cheah, Stokes and Wilson, 1999). Economics graduates will also face a world with career and business opportunities that did not in fact exist during their time in university, (Gale and Parker, 2013). Thus, it is important for graduates to have developed the essential skills needed to interact with diverse colleagues, as well as a diverse career landscape. Economics graduates have the potential to find that the content gained from their university education is either redundant or irrelevant in a dynamic world. Thus, economics graduates need to be equipped with concepts that have transformed their way of thinking. With these concepts in hand, graduates can then integrate these transferrable skills into their careers.

Thus, a transformation of economics curricula is needed to cater for the transformation of the student cohort, as well as to cater for the students' integration into a transforming world. There is a need for the economics curriculum to engage specific pedagogical practices that deliver a better student experience, the intended learning outcomes, and the desired graduate capabilities. To transform a student, student engagement must be integrated into the economic curriculum. Via the integration of student engagement, these opportunities transform the student learning experience. In essence, the economics curriculum needs to be transformed from a content-driven curriculum to a threshold concept-driven curriculum.

Of pedagogical concern, is that researchers such as Becker (2000) have reported in the United States of America, that the field of economics has placed little value on the importance of teaching in recent decades. Furthermore, as Becker (2000) notes, the issue is serious because often, one or a couple of undergraduate courses in economics is usually the only exposure of the economics profession that undergraduate business students have. Despite the report of Becker (2000), economics curricula is quite homogeneous across both institutions as well as over time in English-

speaking countries such as Australia and South Africa (Alauddin and Valadkhani, 2003; Thornton, 2012; Goebel, 2017). Such homogeneity in itself does not imply a flaw in the curriculum design. However, it is questionable whether the current homogeneity of economics curricula, as well as curricula being developed without threshold concepts in mind, is indeed best-practice. One way of improving entry-level economics curricula is by utilising the threshold concepts of economics to guide the teaching of content and hence guide the curriculum design.

Introduction

I am regarded as an inspirational and innovative researcher and teacher of entry-level economics at Macquarie University.¹ My enthusiasm for researching in the field of learning and teaching economics, teaching economics and passion for improving student outcomes have inspired and engaged tens of thousands of students and scores of teachers for more than a decade. I successfully utilise large lecture theatres as a crucible to develop a culture of active learning that nurtures students to develop a desire to engage in the field of economics. I am a firm believer that the learning journey becomes a fruitful one for both teachers and students when the focus is on inspiring students to want to learn. I emphasise the ‘*why*’ of learning via the application of my research into the threshold concepts of economics and teaching sequences (Meyer and Land, 2003). I also believe that teaching is about empowering students to navigate their own learning journey. I aim to equip students with the tools that they require by focusing on the ‘*how*’ of learning via the application of my research into learning taxonomies and learning progressions (Anderson, Krathwohl, *et. al.*, 2001). The experiences that I create in my classroom and beyond, highlighting the ‘wow’ moments, are those that students will remember in the years to come. The challenges, triumphs, hurdles and victories that students experience throughout their time with me transform their thinking and perceptions of economics as a discipline and transform their thinking and perceptions to realise that ‘Economics is Everywhere’ in the world.

I have over a decade of experience in teaching in various roles – starting off as a teaching assistant, and now I am a sessional lecturer in the Department of Economics, which is part of the Faculty of Business and Economics at Macquarie University, Sydney, Australia.

Students learn best when they are inspired to learn – the ‘*why*’ about their learning. Students also learn best when teachers acknowledge that learning itself is a journey that requires tools to navigate

¹ Macquarie University Vice-Chancellor’s Award for Teaching Excellence (2017); Macquarie University Student-led Award for Excellence in Teaching (2017); Coursera Outstanding Educator Award – Transformation (2018); Macquarie University Programs that Enhance Learning (2018)

– equipping students with the ‘*how*’ about their learning. For a teacher to successfully inspire a student to embark on this learning journey, the teacher must convey the relevance of their discipline (Burdina and Sasser, 2018). For students to successfully navigate the learning journey, a teacher must equip the student with the required learning tools (Dowd, *et. al.* 2015).

Student-centred learning and teaching

Often with first-year undergraduate students, imparting the ‘*why*’ about learning is extremely challenging as these students have a limited experience of the world beyond schooling. My approach to conveying the ‘*why*’ to students revolves around a student-centric focus – I consciously, but genuinely, conduct myself as an approachable and empathetic person who cares about students’ needs. Students desire to embark on the learning journey when they can trust that their teacher has their best interests at heart. I am unashamed about demonstrating passion for my discipline and passion for the teaching of my discipline – aligning this passion with students’ own aspirations to draw them into the learning journey without potentially alienating students (Cousin, 2006). Here my teaching draws upon the research into threshold concepts – these are the transformative and integrative concepts that change the way students view the world (Meyer and Land, 2003). Students are transformed and equipped with transferrable concepts that they can integrate into every aspect of their lives. Through purposeful design, I pro-actively develop the course’s curriculum to explicitly and constantly present the relevance and significance of economics to the student, thereby drawing a rational response from students to *want* to learn.

I have had numerous opportunities to attend his lectures and observe his teaching style... fully grounded in a student-centric learning process.” – Mrs Mahak Sambyal, Tutor, Economics.

A culture of learning

My approach to equipping students about the ‘*how*’ of learning also revolves around a student-centric focus: I design a unit of study to not be restricted to the classroom – a unit of study is designed to be a culture of learning. Developing a culture of learning begins in lectures, where a positive atmosphere of learning is created by involving students in lecture activities, as well as explicitly allocating time in lectures for students to teach and learn from each other (Yamarik, 2007; Oates, 1999). Students then realise that their take away from lectures is not just the content, but also the ‘*how*’ of learning this content. To further equip students how to learn, every learning activity is explicitly designed around learning how to learn, through a purposeful four-step

scaffolding titled: *R.E.A.L.* This four-step scaffolding is a re-imagination of the revised Bloom's taxonomy (Anderson, Krathwohl, *et. al.*, 2001) which is outlined later in this chapter, and thus utilising assessments *for* learning (Boud, 2000). Finally, as my teaching often involves large and diverse cohorts in a single subject in the Faculty of Business and Economics, my approach is to equip students with a variety of resources to cater for a variety of learning styles, where students are empowered to self-select which resources are optimal for their own learning journey.

A connected learning community

The achievement of a transformative culture of learning that emphasises the '*why*' and the '*how*' of learning aligns well with my university's learning and teaching framework which champions a *Connected Learning Community* – via a ***Connected Curriculum***, ***Connected Learning Experiences***, and ***Connected People*** (see Figure 1). I elaborate on these facets later in this section.

Gajwani and Miron (2015) discuss how it is possible to build a successful learning community in a large undergraduate economics course. To provide a cohesive context to applying research into learning and teaching into an economics curriculum to create a ***Connected Learning Community***, this thesis will focus predominantly on my contributions in one particular subject of study: *Microeconomic Principles* – ECON111 where, as a lecturer and convenor (co-ordinator) of this subject, I have taught more than 3,000 students per year.

For this chapter and the rest of this thesis, I use the term “course” when referring to a particular subject such as ECON111 in a degree, and I use the term “program” when referring to an entire degree. This terminology is to align myself with the literature in the field of learning and teaching.

A connected learning community

We will realise these objectives by creating a **connected learning community**.

By connecting our learning experiences and our curriculum, and by better connecting our students, staff and alumni with each other and the broader community, we can build the opportunities we need to meet our strategic priorities.

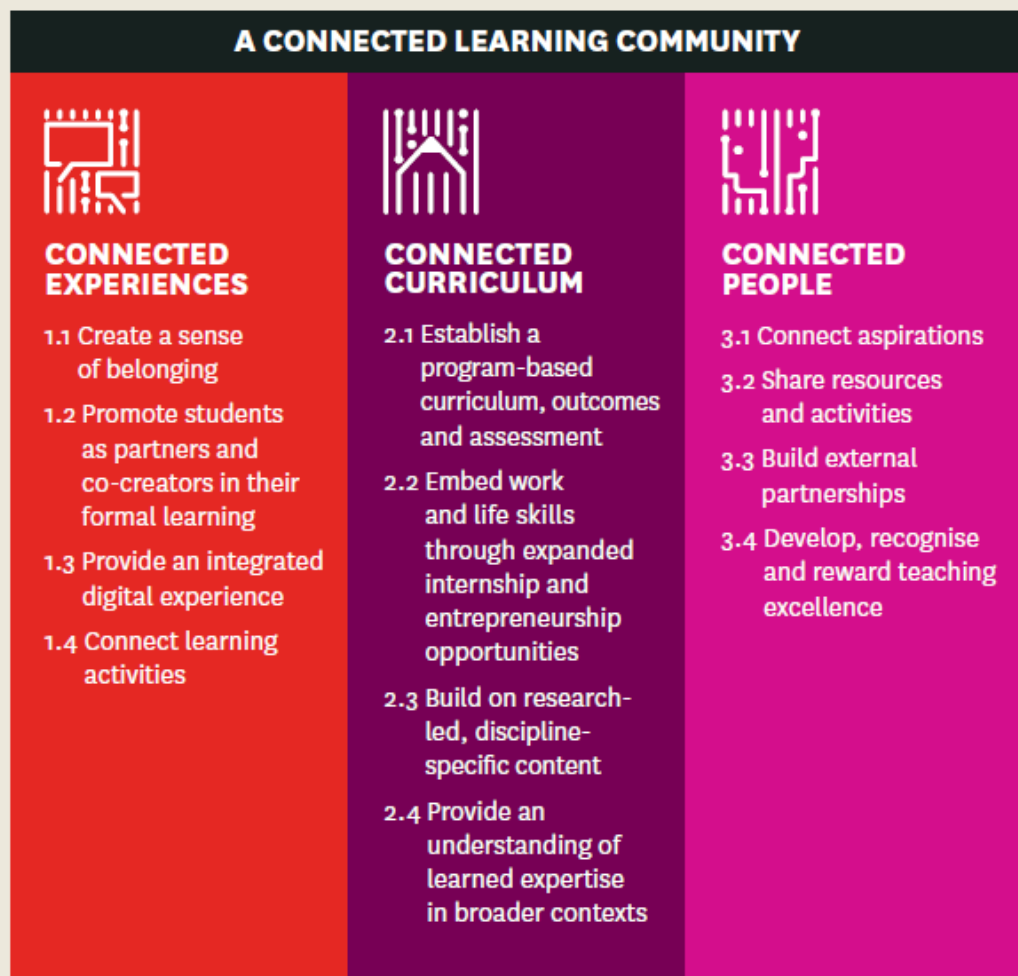


Figure 1: A connected learning community

Source: *Learning for the future – learning and teaching strategic framework: 2015 –2020*, Macquarie University, 2015

Overcoming challenges

Microeconomic Principles – ECON111 is a core course for all Faculty of Business and Economics (FBE) programs at Macquarie University, catering to a variety of disciplines such as accounting, entrepreneurship, finance, human resources and marketing, and this suite of majors is constantly evolving. Over the years, ECON111 has grown exponentially from approximately 1,000 students in 2007, to 2,000 students in 2010, and 3,000 students in 2017. Such a mix of majors and such class sizes present challenges to co-ordinators in gauging whether the course suits the needs of a large and diverse student cohort (Harlim, de Silva, and Belski, 2009). The highly theoretical and often abstract concepts in microeconomics are often challenging to unpack and engage with for this large and diverse student cohort (Gajwani and Miron, 2015). Thus, I utilise my teaching philosophy that is informed by research to inspire, motivate and engage this cohort by emphasising the ‘*why*’, and by focusing on the ‘*how*’ of learning.

He develops resources and methodologies that encourage students to learn, that relate sometimes abstracts concepts to everyday reality, and make economics digestible to a variety of learners – Mrs Stephanie Brooks, Curriculum Developer, FBE.

Transformative teaching and learning

I strongly believe that this approach to teaching, by focussing on the ‘*why*’ and the ‘*how*’ of learning, will result in a transformative experience for the student, and better equip them for a dynamic world upon graduation (Burdina and Sasser, 2018). My teaching philosophy and my teaching approaches have been proved and tested over more than a decade where I have received extremely positive student feedback and learning outcomes. This positive feedback extends to after students have graduated when they fully realise the power of transformative teaching and transformative learning. Students have also readily provided unsolicited feedback to academics across the university:

Numerous students have ... commended [Prashan] on keeping them engaged throughout the lecture... This has motivated them to pursue Economics as their chosen major. – Mrs Leanne Mendonca de Mello, Tutor, Department of Applied Finance and Actuarial Studies.

The successes of this *Connected Learning Community* in ECON111 delivers an excellent student experience for this large and diverse cohort. This is evidenced through my excellent student survey results, for more than a decade. In my most recent student survey from 2017, of a 500-student lecture stream, and a 32% response rate, the core questions that pertained to my teaching had no

question scoring less than 4.8 out of 5.0, where some questions such as: “This teacher seemed enthusiastic about teaching the class,” scored 5.0.

In the four lettered sections, A – D, that immediately follow, the **items in bold** are the three objectives and twelve corresponding key goals from the *Connected Learning Community* that is outlined in *Learning for the Future* – Macquarie University’s Learning and Teaching Strategic Framework (Figure 1). The headings for the four lettered sections that follow are from *Universities Australia*, which is the peak body that represents Australia’s university sector. The four lettered headings are the criteria that *Universities Australia* uses to judge excellence in teaching².

Ideas from the four lettered sections that follow have been presented by me at:

The connected classroom – connected experiences, connected curriculum, connected people, learning and teaching workshop, Macquarie University, Australia, 19 April 2018.

A. Approaches to learning and teaching that influence, motivate and inspire students to learn

As part of the *Connected Learning Community* that I foster (Gajwani and Miron, 2015), one facet is *Connected Experiences*. In the course’s ‘KickStart’ video³, I introduce students to relatable and exciting photo-examples from around the world, (Al-Bahrani and Patel, 2015), showing students that ‘Economics is Everywhere’ – from the stock exchange in Shanghai, to a ‘Lord of The Rings’ movie set in Hobbiton, New Zealand. Throughout the semester, I bring the concepts to life via photos of examples that the students would be experiencing every day – these include photo-examples created by the students themselves (Al-Bahrani and Patel, 2015). Instead of traditional lecture slides, I build the content step-by-step, *with* the students, using a blank paper on a visualiser / document projector (Salemi, 2002). I then break down the otherwise difficult and abstract concepts of economics, through the careful use of language as outline in Dyer (2013).

² Available at: <https://www.universitiesaustralia.edu.au/uni-participation-quality/AAUT>

³ Available at: <https://www.youtube.com/watch?v=VadRkVjCp00>

Furthermore, during lectures, **students become partners and co-creators in their formal learning**, where students take part in various in-lecture activities to develop the content (Emerson and English, 2016). For example, for the lecture on *Production Choices and Constraints* (which I elaborate on in Chapter 3), students simulate a factory production line in the lecture itself and generate data for various economic scenarios. This data is fed into Excel to generate students' own tables and charts, giving ownership to the students, and **providing an integrated digital experience** (Imazeki, 2014). Here, the experiment and Excel bring the topic, maths, graphs and, hence, difficult and abstract concepts to life. Specific time is also devoted in lectures where students themselves teach and learn from each other. Students realise that attending lectures is worthwhile as they are not only engaging with content, but that there is a transformative experience in the classroom (Yoon, Oates and Sneddon, 2014). For example, to ensure that they understand the concept and impact of a price ceiling, I would ask them to explain an un-taught concept to their neighbour: a price floor. This builds confidence, as students are self-teaching each other a new and un-taught concept, *and* it gives them a chance to iron out any misunderstandings during the lecture itself, through a safe peer-review with their lecturer as the moderator. Such an approach is discussed in the flipped large lectures in Balaban, Gilleskie and Tran (2016).

Overall, in-class group experiments, the integration of technology, and peer-based learning, **creates a sense of belonging for students** (Roach, 2014).

When describing his lectures... students use words such as 'engaging' and 'worthwhile'...

– Dr Gordon Brooks, Head of Department, Sessional Academic Staff Unit.

Students are consequently inspired and engaged through this student-centric learning process and thus attendance in lectures is consistently high. Evidence of this is in the university utilising my lectures for video / photography for: Macquarie University's *Framing of Futures* project (2013)⁴, and a piece for the ABC's *7:30 Report* (2016)⁵. Large, diverse and engaged lectures transform the student learning experience through an evident and visible culture of learning (Roach, 2014), where the lecture is the crucible for that culture to develop, and then radiate:

⁴ Available at: <https://www.mq.edu.au/our-university/>

⁵ Available at: <http://www.abc.net.au/7.30/content/2016/s4528939.htm>

Offering an engaging and innovative curriculum through the use of media and technology to connect with his students in every lecture. The success... is evident in his average lecture attendance of 90% in Macquarie Theatre. – Student comment on ‘MQ This Week’ site.

He is innovative in his teaching method, ... the skills and ability to make an otherwise tricky, overwhelming, content heavy unit easier to understand.... A practical lecture environment, questions are asked, students are engaging... throughout the lecture rather than sit and listen to the lecturer read off the lecture slides – Student comment at ‘MQ This Week’ site.

Outside of the classroom, **students continue being partners and co-creators** of content, by taking photos of various examples of ‘Economics is Everywhere’ and tagging these photos on social media as examples for the various topics (Al-Bahrani and Patel, 2015). For example, several students photographed ‘Australia Post’ postal boxes and tagged these as #mqmonopoly, and several students photographed banks and ATMs and tagged them as #mqoligopoly. This enquiry-based learning gives students ownership of the content, and demonstrates the relevance of the discipline to their lives:

Prashan’s approach to teaching is based on the quest to demonstrate how diverse individual experience forms part of and relates to his discipline... Coupled with a radiating passion for teaching and an enchanting personality that connects with students on an individual level, this allows Prashan to foster an inclusive learning environment and captivate and motivate even the most disengaged learners. – Ms Mirjana, Jovancevic, Associate Director, Macquarie University International College.

Students who are instilled with the ‘why’ and the ‘how’ of learning will be connected into the learning community and inspired to want to learn (Burdina and Sasser, 2018):

His passion for his work is immediately obvious to his students... many students comment on how his teaching techniques help to make studying fun and enjoyable and motivate them to want to study harder. – Ms Mara Hammerle, Tutor, Economics.

Not only does Prashan motivate and inspire students ... [he] continues to enthuse them beyond the end of the session. A number of students have attended an ‘extension’ lecture that Prashan organised after completion of the unit and after results have been released – they wanted even more. – Mrs Laura Billington, Departmental Administrator, Economics.

B. Development of curricula and resources that reflect a command of the field

Students receive a transformative learning experience as I equip them with resources about the ‘how’ of learning. The second facet of a *Connected Learning Community* that I foster, is a *Connected Curriculum* (Biggs, 1996). To ensure that the curriculum is designed to transform the student, every learning and teaching activity is constructed around a re-imagining of the revised Bloom’s Taxonomy (Anderson, Krathwohl, *et. al.*, 2001). Here, every activity in ECON111 is broken into four parts, where each part gets progressively more challenging (Davies and Mangan, 2008) and involves higher-level thinking, progressively working through the revised Bloom’s Taxonomy around the acronym, *R.E.A.L.* (which I elaborate on in Chapter 3):

‘R’ – *Re-cap and Remind*, where students are to re-call the concepts covered that week;

‘E’ – *Economics Everyday*, where students can engage with and relate to these concepts by connecting these concepts to examples or scenarios that they experience every day;

‘A’ – *Application and Awareness*, where students take their knowledge further by applying these concepts to a different, but a practical and contemporary scenario, thus **providing an understanding of their learned expertise in a broader context**; and finally,

‘L’ – *Learning Life Lessons*, which is an evaluative exercise, encouraging informed critique on a contemporary social issue that **builds on research-led, discipline-specific content**.

This *R.E.A.L. framework* also fosters a **program-based curriculum**. When students attempt the challenging material in *Learning Life Lessons*, they are equipped with the ‘how’ of tackling higher-level courses in the program (Dowd, *et. al.* 2015). With this scaffolding, students are thus equipped with **generic work and life skills to apply to their work, career and entrepreneurial endeavours**. Thus, they engage themselves in the course, as the learning and teaching activities explicitly highlight and work towards the ‘why’ of their learning:

A real student-centred focus... I would say he goes above and beyond for his students... also strives to relate the topic material to real world applications so that students can see the relevance and usefulness of what they are learning.” – Mrs Karen Mills, Lecturer, Economics

The framework not only assists students, but also assists teaching staff by creating an atmosphere of learning and discovery in the classroom:

The tutorials are well planned... designed in a manner that engages the students... excellent use of real-world current case studies to weave theory into these case studies in a way students can more easily comprehend economic concepts... Class is fun as a result.
– Mrs Alanna Hardman, Tutor, ECON111.

The teaching notes and solutions provided to tutors are first edited at a macro-level, to create revision resources for students, and further edited at a micro-level, to create worksheets to assist students who need additional support on the ‘how’ of learning. Thus, the creation of these resources is a scalable way of designing an entire suite of resources via customising a single resource into several differentiated activities. Likewise, editing a lecture recording, and storing all lecture writing, also creates multiple learning resources in a sustainable way. Students are empowered to self-select the learning resources depending on their own learning styles and own learning needs.⁶

I have been very impressed with the efforts... to develop resources to support student centred learning. In particular his production of online content to supplement classroom teaching has been outstanding... both engaging and instructive. – Mr Phil Goody, Learning Designer, FBE.

It is a delight to see the innovation he has engineered into ECON111 at MQ. The iLearn for the subject is fantastic. There are so many resources there to help the students, yet it is also fun, light and visually appealing. – Mrs Alanna Hardman, Tutor, ECON111.

Furthermore, when these resources were adopted by our pathway college, Macquarie University International College, the resources easily lent themselves to the production of a single workbook, highlighting the customisability and scalability of this process (Dowd, *et. al.*, 2015):

The unit content [is] interesting and relevant... and resource development help[s] our students to achieve their best... the workbook you had put together has been an invaluable resource... The fail rate in the unit decreased significantly and now students are attending their classes more regularly... a great improvement in the delivery. – Dr Onur Ates, Senior Teacher, Macquarie University International College.

⁶ Available at: <http://prashankarunaratne.wixsite.com/teaching>

The scalability of the *R.E.A.L. framework* is exemplified by Macquarie University winning the bid to teach Excel on the premier Massive Open Online Course (MOOC) platform, *Coursera*. Here, the worldwide winning bid was framed around my pedagogy, *R.E.A.L.*, and this scaffolding was singled out as a factor in winning the bid to launch the course. The course, *Excel Skills for Business*⁷, launched in late 2017 and I am the lead instructor. Adopting my teaching pedagogy in ECON111 in this Excel course helped create a transformative experience for students in Excel as well. The transformative experiences of students in *Excel Skills for Business* resulted in the course winning one of three global awards by *Coursera* in 2018 – *The Outstanding Educator Award for Transformation*⁸.

C. Evaluation practices that bring about improvements in teaching and learning

In further fostering a *Connected Curriculum*, I constantly review and evaluate my teaching practices. In prior years, comments in student surveys indicated that students felt that the course, ECON111, was somewhat irrelevant and disconnected from their own ambitions (Siegfried and Walstad, 2014). I then came across the research on threshold concepts, especially in relation to the teaching of economics (Meyer and Land, 2003). I recognised that one great way to influence and inspire a diverse cohort was to impart a *lens* for students to view the world by attaining the threshold concepts of a discipline. The aforementioned *R.E.A.L. framework* helped students achieve this learning objective by guiding them systematically to higher level learning (Anderson, Krathwohl, *et. al.*, 2001). Students would gain curiosity in the discipline as they now see the world in a different way, thus instilling the ‘*why*’ of learning (Burdina and Sasser, 2018).

To **understand learned expertise in a broader context**, I also evaluated the United Kingdom’s *Benchmark Statement for Economics*, which is explicitly based on threshold concepts (QAA, 2007; QAA, 2015). With these insights, I wove the agreed threshold concepts of economics (Davies, 2012) into the course’s curriculum, thus **building on research-led, discipline-specific content** to create a *Connected Curriculum* (Biggs, 1996):

⁷ Available at: <https://www.coursera.org/specializations/excel>

⁸ Available at: <https://blog.coursera.org/transforming-lives-basic-digital-skills-insights-excel-essentials-business/>

A key challenge is to engage and support the students in their first experience of economics ... Prashan accomplished this thorough a redesign of the unit and by paying acute attention to student needs. He redesigned the unit around threshold concepts in economics, an innovative approach, which brings the importance and interconnectedness of economic concepts to the forefront... Prashan's tireless efforts in engaging and supporting the students... has engendered an interest in them towards further study in economics. – Head of Department, Examiners' Report, Economics (2015).

To continue the ongoing evaluation of my course, I enlisted ECON111 as an initial adopter of the faculty's Unit Representative Program (URP), which also gave students the opportunity to **embed work and life skills** into their experience at university (McGoldrick, Hoyt and Colander, 2010). Andrietti and Velasco (2015) discusses that study time is an important determinant of learner performance. Thus, I eagerly became the first convenor (co-ordinator) of a large course in my university to adopt the Moodle Engagement Plug-in (MEAP). These programs enabled me to evaluate the student experience and to evaluate their engagement, to respond in a timely way.

Prashan has included the [Unit Representative] program in ECON111 since its inception... students consider Prashan to be an exceptional teacher with unparalleled ability to motivate students to learn. In one unit representative's words, 'Prashan makes the lecture unforgettable and engraves the concepts into our minds in an enjoyable way' ... the Faculty trialled an iLearn plugin (MEAP) that ... identif[ied] and contact[ed] students who were at risk... Prashan was very attentive and responsive to signs of disengagement... to prevent that disengagement from leading to failure. – Dr Janise Farrell, Student Engagement Co-ordinator, FBE.

He introduced comprehensive strategies to identify and assist struggling students and students at risk... significantly improved the retention rate and enhanced student performance across all grades. – Head of Department, Examiners' Report, Economics (2015).

These connected evaluative practices and intervention strategies lead to the third and final facet of a ***Connected Learning Community***, which is ***Connected People*** (Gajwani and Miron, 2015):

Not only did I learn using his techniques, but the way he taught the unit made me feel like it was a constant learning process and I didn't have to cram everything. It was almost like his teaching methods involved us to store information bit by bit that nothing became daunting or super difficult in the end. His lectures were extremely interactive and used techniques... in order for us not to forget economic theories. He taught economics in a way where we didn't have to be scared and made us feel like economics was integrated in our everyday lives. I realised that it was his teaching methods that allowed me to do well... made me feel like he really cared about us students... I think Prashan is a really valuable staff member in the faculty and if more lecturers were like him, the university would be a much better place and lectures would always be full. – Letter to the Head of Department.

D. Innovation, leadership or scholarship that has influenced and enhanced learning and teaching, and the student experience

In relation to ***Connected People***, for several years I have presented at the university's *Learning and Teaching (LandT) Week*, thereby **connecting aspirations** with colleagues across my university. For example, at the *LandT Week* in 2015, I presented three papers, all from my research on engaging students in their first year via a ***Connected Curriculum***. Attached to this event, my blog, sharing my teaching expertise on the university's learning teaching blog, *Teche*, was the most viewed *Teche* article of 2015⁹. In addition, Faculty of Business teachers undertaking the *Foundations of LandT (FILT)* course attend my classes for peer observation. In recent years, I have also run several workshops for academics at my university: *14 Ways to Maximise Student Engagement*; *Making Your Teaching R.E.A.L.*; *Transformative Teaching Via the 'Why' and the 'How' of Learning*; *The Connected Classroom – a Connected Learning Community*; and *The Connected Classroom – where Everyone Says Wow*. The presentation of such workshops equips and empowers others to **develop their own teaching excellence**.

⁹ Available at: <http://teche.ltc.mq.edu.au/connect-more-with-prashan-karunaratne/>

A practical, simple, and effective approach to achieve desired learning outcomes... while also equipping teachers ... how to best deliver the topic material – Workshop participant, Macquarie University.

I was honoured to be featured via the inaugural *Teche INSIGHTS* post in 2017 ¹⁰, as well as a second feature article about my *R.E.A.L. framework* in the *Teche* blog in 2017 ¹¹. Several exemplars of my teaching have been showcased by the university including: the university's weekly newsletter, *This Week*, the university's podcasting platform, *Pioneering Minds*, and the university's various *YouTube* channels. Examples of the learning and teaching activities that I created, such as those discussed in Chapter 3 have been used as exemplars to engage and equip teachers beyond my home university. Exemplars of my teaching were an integral part of the China Scholarship Council-sponsored *Advanced Professional Development Program (APDP)* in both 2015 and 2016. As part of this program I also ran several learning and teaching workshops for these academics, thus **connecting people through external partnerships**:

When we ran it last year, [Prashan's] teaching method engaged and informed the Chinese academics ... So, this year he played a larger role. The 24 economics lecturers observed his weekly lectures followed by a special "debrief" of his teaching method... he was also able to give presentations on assessment... curriculum and writing about learning and teaching. – Dr Helene Mountford, APDP for Academic Staff Co-ordinator, Learning Innovation Hub.

Delivery of this program resulted in an external research collaboration with Wuhan University, as well as their adoption of my teaching expertise in their Master of Business Administration's microeconomics course:

You are such a great inspiration for many Chinese lecturers around us now... I will teach with threshold concepts again in October. Your contribution will again be a main reference for my design of teaching. – Assoc. Prof. Lin Guo, Wuhan University.

I have published research that is part of this thesis, presented here as Chapter 2, and this work is being cited by others in fields beyond the learning and teaching of economics. At my home

¹⁰ Available at: <http://teche.ltc.mq.edu.au/introducing-teche-insights-prashan-karunaratne/>

¹¹ Available at: <http://teche.ltc.mq.edu.au/world-tech-savvy-student-stay-ahead-r-e-l/>

university, I received the *People's Choice Award* in the *Three-minute Thesis* competition, thus **rewarding excellence** in my teaching and my research. I have presented research from this thesis at the *Australian Conference of Economists*, as well as the *Australasian Teaching Economics Conference* over the last three years, **sharing my pedagogy, resources and activities** with economics lecturers across Australia. I have also presented the ideas from this thesis at the inaugural pathways-to-university conference in Australia, *Pathways PD²*, sharing my pedagogy with lecturers across disciplines.

Beyond Australia, in 2018 I have been invited by the international education specialist firm, *PacAsia*, as well as the *Australian Trade and Investment Commission*, to present the work from my thesis to engage and equip teachers and lecturers overseas. I have run teacher training workshops in Hyderabad, India; Kathmandu, Nepal; and Dhaka, Bangladesh – thus, creating *a Connected Learning Community*.

Literature Review

Everyone's lives are affected by economic decisions, whether those decisions are made by oneself or made by others (Dwyer, 2017). This is because economics is the study of how agents decide how to allocate their resources to satisfy their unlimited wants. To make choices, agents make trade-offs by evaluating benefits against costs. These choices then raise questions of the efficient use of resources as well as the fair allocation of resources and outcomes.

Since 2001, even though enrolments in economics at university are declining, enrolments in other subjects have risen, including the overall student population at universities (Dwyer, 2017). According to Dwyer, we are now experiencing a displacement of economics by other business-oriented subjects including banking, finance, management and commerce.

As economics is relevant to everyone, as a society it is important to consider where economics is not studied more widely. According to Dwyer, interest and enrolments in economics at both high schools and universities has fallen rapidly over the past three decades. This not only has an impact on the discipline of economics, but also on the level of economic literacy that society possesses.

Students often find economics to be a difficult subject at both school and university (Wilson, 2018; Dwyer, 2017; Hedges, 2008). Students may find the subject difficult due to the abstract concepts that are being taught or because of the way the subject is taught traditionally (Goebel, 2017). Making the abstract concepts relevant inspired me to engage students with the ‘*why*’ of learning economics. Addressing the way the subject is taught traditionally inspired me to equip students with the ‘*how*’ of learning economics. Goebel (2017) also notes that students are unable to grasp the way economists view the world.

Addressing these concerns in undergraduate courses is paramount for economics because these concerns result in high failure rates, high dropout rates, and a high level of dissatisfaction about the quality of learning and teaching (Jackson and Ross, 2005; Colander and McGoldrick, 2009; Dubas and Toledo, 2016). As a lecturer in economics, I too echoed these concerns where I interacted with students who had difficulty in applying the economic principles and concepts that we were trying to teach them. Furthermore, for students who chose to major in economics, passing the introductory economics courses was not a guarantee of their success in the intermediate or capstone economics courses. Here again, students found it difficult to apply what they had learnt to real life scenarios.

Little research has been undertaken on processes that engage students in the ‘*why*’ and the ‘*how*’ of learning and teaching economics. As this research is lacking – teachers of economics are unable to equip themselves with the tools necessary to engage and equip their students to progress in the discipline. The literature that has now become known as the Threshold Concept Framework aims to address the issue of engaging and equipping students to progress in a field of learning (Land, Meyer and Flanagan, 2016). Intriguingly, the threshold concept view of learning was birthed in economic education research (Meyer and Land, 2003). This view of learning is gaining traction in undergraduate teaching, postgraduate training, as well as professional development (Flanagan, 2014).

Meyer and Land (2003) note that there are certain critical concepts which have to be mastered in order to progress in the ways of thinking of a discipline. As these concepts are troublesome to learners, and because these concepts are transformative, students find it difficult to attain the threshold concepts because learning and cognition are inter-linked (Goebel, 2017). Cousin (2006) notes that learning of the disciplinary content needs to take the learner and their personal context into account – hence the important of embedding the ‘*why*’ and ‘*how*’ of learning into a curriculum.

Thus, the Threshold Concepts Framework gave me a framework to inform the design of my course's curriculum, as well as the framing of each learning and teaching activity. I utilised the framework to sequence the entire curriculum, as well as guide the progression of each lecture, each tutorial, as well as the course's assignment. I felt that this approach would engage students with the 'why' behind their learning of economics, as well as equip students with the 'how' in their learning of economics, assisting their transitions to university and beyond.

Transitions to higher education

In the higher education sector, students in their first year of study are keenly observed by researchers, administrators and practitioners (Kift, *et. al.*, 2010) as this is a key transition point. Thus, there is a large and growing body of research into the policies and the practices that are designed to target and improve the first-year experience of students. This literature on the first-year experience discusses improving student success, retention and engagement. The literature highlights the personal influences on the first-year experience such as student finances and student commitment to study (Yorke, 2006; Yorke and Longden, 2008), as well as the institutional influences such as the institutional structures, teaching staff and support staff – institutions and their teaching and support staff need to provide the necessary “conditions, opportunities and expectations” for adequate engagement to occur (Coates, *et. al.*, 2005, p. 26). Other papers that discuss the institutional obligations to the first-year experience are also presented in Bradley, Noonan, Nugent and Scales (2008), Tinto (2009) and Gillard (2010).

Wood and Breyer (2017) introduce a model that argues that the transition to university, such as the first course in economics, is critical to the transition from university to professional work or further study. This first transition into university study sets the scene and creates the conditions for students to be able to make the most of their university learning. The first course in economics introduces the key ideas and lenses through which to view the rest of their degree and professional work. Given that many students are the first in their family to gain access to university study (O'Shea, *et. al.*, 2017), this positioning of their learning at the start of their journey is critical. Engelbrecht and Harding (2015) show that a coherent framework, and a specific learning and teaching strategy in first year course can improve student success.

The 'why' and the 'how' of learning and teaching economics is a critical transition opportunity. While attention to the threshold concepts of economics will help with emphasising the 'why' of

learning economics, attention to learning taxonomies will help with developing the ‘*how*’ of learning economics

Thinking like an economist

Whenever a group of like-minded enthusiasts about the learning and teaching of economics gather, the common denominator is that we all want students to show us that they can “think like an economist” (Siegfried, *et. al.*, 1991). As Becker (2000) notes, the ultimate aim of economics teachers is to get their students to apply the principles, concepts and tools of economics. However, for this to occur, students need to have internalised these ideas first. More than merely a discipline of principles and concepts, economics is inherently a way of thinking (Entwistle, 2005). Thus, for students to understand economics, they need to understand the structure of the discipline, and the structure of the ways of thinking. As Colander (2004) and Entwistle (2005) note, there are two facets of knowledge in economics – a core of concepts, as well as a unique methodology of thinking. Effectively learning economics requires students to master the essential and critical concepts so that they can develop a new way of thinking (Siegfried, 2009; Hansen, 2009).

According to Keynes, economics is:

a method rather than a doctrine, an apparatus of the mind, a technique of thinking, which helps the possessor to draw correct conclusions – (Keynes, 1922, cited in Goldsmith and Casey, 2012, p. 234).

Goebel (2017) notes that students find difficulty in the progression from the acquisition of concept to the practice of thinking as an economist. A wide body of research in economics education acknowledges this problem (Green, Bean and Peterson, 2013; Dynan and Cate, 2012; Wilson and Dixon, 2009; Frank, 2005; Becker, 2004). However, there is little research on acknowledging the source (the ‘*why*’) or acknowledging the processes (the ‘*how*’) of learning and teaching economics. Goebel (2017) notes that economics educators widely agree that the learning of economics requires mastering ideas that are troublesome and transformative – and the theory of threshold concepts formalises this supposition. Threshold concepts are the transformative and integrative ideas of a discipline that learners find troublesome (Meyer and Land, 2003).

Mainstream economics agrees that there is a core of essential concepts, where this core is derived from the scarcity of resources and unlimited nature of wants – and this core helps derive the rest

of the discipline's ideas (Saunders, 2012). There is also a growing movement to introduce pluralist ideas to economics curricula (Decker, *et. al.*, 2018). This thesis does not aim to answer the question of 'what' an economics curriculum ought to entail. I take the mainstream introductory microeconomics course's content as given, and I develop a curriculum design that engages and equips students within this pre-determined content.

I began my research study with an existing introductory level microeconomics curriculum. Like most undergraduate microeconomics courses, the content of the course is based in mainstream, neoclassical thought. Irrespective of the prominence of a particular school of thought in the content, the ways of thinking as an economist – gaining the ability to apply the core principles and concepts of economics would be a common goal for teachers across most schools of thought.

Beyond this introductory course in economics, there is scope for the curriculum to incorporate pluralist content and ideas to further engage and equip students in economics (Denis, 2013; Mearman *et. al.*, 2011; Freeman, 2010). The *CORE Project* also addresses the engagement in economics by addressing the content of the curriculum to include the economics of innovation, inequality and environmental sustainability (Skyes, 2015).

As the course, ECON111, is a service course in my university's Faculty of Business, the course's content is pre-determined at a faculty-level so that the content caters to all majors within the faculty. Thus, for my research agenda I define a specific constrained optimisation problem (Hultberg and Calonge, 2017). My aim is to engage students in the 'why' of learning economics and equip them with the 'how' of learning economics – given the constraints of a curriculum that has a given set of content, a given amount of time and a given level of funding.

Higher education in economics

The discipline of economics, like other disciplines, is now catering to an ever-diversifying student cohort each decade (Cheah, Stokes and Wilson, 1999). Economics graduates will also face a world with career and business opportunities that did not in fact exist during their time in university, (Gale and Parker, 2013). Thus, it is important for graduates to have developed the essential skills needed to interact with diverse colleagues, as well as a diverse career landscape. Economics graduates could find that the content gained from their university education is either redundant or irrelevant in a dynamic world; thus, they need to be equipped with concepts that have transformed

their way of thinking. With these concepts in hand, graduates can then integrate these transferrable skills into their careers.

Of pedagogical concern is that researchers such as Becker (2000) have reported that the field of economics education has placed little value on the importance of teaching in recent decades. Furthermore, as he notes, the issue is serious because often, one or a couple of undergraduate courses in economics is usually the only exposure of the economics profession that undergraduate business students have. Despite his report, economics curricula are quite homogeneous across both institutions and time (Goebel, 2017; Alauddin and Valadkhani, 2009). Such homogeneity in itself does not imply a flaw in the curriculum design. However, it is questionable whether the current homogeneity of economics curricula, as well as curricula being developed without threshold concepts in mind, is indeed best practice. One way of improving entry-level economics curricula is by utilising the threshold concepts of economics to guide the teaching of content and guide the curriculum design.

While there are threshold concepts in economics, as elaborated in the next section, these are generally not explicitly addressed in entry-level economics courses and these threshold concepts do not guide the curriculum design. Traditionally, the content of economics guides the curriculum design, and hence the result is the aforementioned homogeneity of courses across institutions and time. Thus, these concepts are generally scattered throughout the various content modules and lecture topics, rather than being a guide to design the curriculum – they are presented to students in an implicit rather than an explicit sense. A disadvantage of this approach, as noted by Meyer and Land (2003), is that the targeted student cohort could potentially not be presented with an opportunity to grasp the threshold concept itself. Therefore, the students would find themselves unable to understand the theory and therefore unable to apply their knowledge in varying circumstances and scenarios.

Thus, an economics curriculum is needed to cater for the transformation of the student cohort, as well as to cater for their integration into a transforming world. There is a need for the curriculum to engage specific pedagogical practices that deliver a better student experience, the intended learning outcomes and the desired graduate capabilities. To transform a student, student engagement must be integrated into the economic, curriculum. Via the integration of student engagement, these opportunities transform their learning experience. In essence, the economics

curriculum needs to be transformed from a content-driven curriculum to a threshold concept-driven curriculum.

Threshold concepts

According to Meyer and Land (2003), threshold concepts are transformative, integrative and troublesome concepts that give practitioners a lens, portal or a gateway to view scenarios that they will experience, or problems that they are presented with. A curriculum designed with threshold concepts as the guide to structure the content would revolve around training students to utilise these transformative and integrative concepts to approach contemporary, dynamic problems. This is thus a departure from a curriculum designed with purely the content in mind which, revolves around imparting content which these students may find irrelevant currently and/or in their future endeavours.

The theory of threshold concepts is an important recent development in discipline-based higher education research (Male and Ballie, 2011). The threshold concept framework can prove to be a useful gateway, portal and lens for academic designers to examine their teaching and learning practice. However, relatively little work has been carried out on the scope of threshold concepts in economics curricula. The discipline of economics, having evolved over the last two centuries, with several conflicting schools of thought, has resulted in an economics curriculum that simply presents mainstream economics ideas (Goebel, 2017; Alauddin and Valadkhani, 2009). The chronology of a typical entry-level undergraduate economics course presents mainstream economics ideas, as a series of modules of content, without regard to the threshold concepts of economics themselves.

The pioneers of threshold concepts in economics are Davies (2006, 2012), and Davies and Mangan (2005, 2007), who have researched and authored several papers on the topic. Firstly, the researchers argued that recognising the transformative nature of threshold concepts would amount to a paradigm shift in a learner's thinking within the discipline of economics. Secondly, the researchers were able to present a case for a web of threshold concepts in the discipline of economics. The acquisition of multiple threshold concepts causes a transformation of the individual because, while each threshold concept is transformative in itself, the synergy of multiple threshold concepts presents yet another transformative experience for the learner. Their research reveals that, rather than a hierarchy of threshold concepts in economics, these concepts exist within

a web of inter-relatedness. Davies work (2012) is thus an essential resource for academics in the field which encapsulates his research and provides a lens to curriculum designers.

Threshold concepts are a useful tool when the issue at hand is that a curriculum may be content-driven (Cousin, 2006). If these concepts are initially identified and isolated, this then empowers lecturers to determine where students tend to get stuck. With this insight, lecturers are not only able to design the curriculum appropriately, as well as the learning activities, assessment tasks and student feedback systems (Hedges and Pacheco, 2015). All of this attention will assist the transformation of the student in terms of the respective discipline. Another challenge for curriculum design is to incorporate student contemporary life in relation to these concepts. This is because the threshold concept approach is not only a way of thinking but also a way of practice.

Benchmark framework

In the United Kingdom (UK), the threshold concepts of economic are being encouraged to be used as a guide when developing economics curricula (Karunaratne, Breyer and Wood 2016). The UK's tertiary education regulator, the Quality Assurance Authority (QAA), has created a Benchmark Statement for Economics (2007, 2015) which outlines the economics curriculum framework for higher education providers. This framework is based on four pillars:

- Subject knowledge and understanding
- Subject specific skills
- The transferable concept
- Numeracy.

The first of these four pillars focuses on the content of economics itself – 'subject knowledge and understanding'. Here the UK framework outlines the core content that a graduate of economics must possess. The pillars of subject specific skills, the transferrable concept, and numeracy are applicable beyond pure economic contexts. The Benchmark Statement for Economics identifies that an economics curriculum also caters to students who may be choosing a major in another discipline (QAA 2015, section 2.3 and 2.4). The second pillar: 'subject specific skills' recognises that: "Some of the attributes that a graduate in economics possesses are generic and not specific to the study of the subject. Their enhancement would be part of any degree program," (QAA 2015, section 5.1).

Within the third pillar: ‘the transferable concept’ is an explicit recognition of the threshold concepts of economics, which are transferable to other subject areas as they are transformative and integrative: “From learning economic principles, the typical student acquires a facility with some key concepts that are present in most of the decision problems that they are likely to face subsequently in their careers,” (QAA 2015, section 5.4). What are deemed as ‘the transferable concepts’ within the UK framework are the threshold concepts of economics which are listed in the ‘Embedding Threshold Concepts in First Year Undergraduate Economics’ (ETC project cited in Meyer and Land, 2006).

The ETC project was funded by the Higher Education Funding Council for England (HEFCE) and the Department for Employment and Learning (DEL) – in the UK, under the Fund for the Development of Teaching and Learning (Davies and Mangan 2005). At the end of the project, the group agreed on the importance of the recognition of threshold concepts within economics regarding the learning and teaching of the discipline (Davies and Mangan 2005). The threshold concepts developed by the ETC Project as reported by Davies and Mangan (2005) are:

- Economic Models
- Opportunity Cost
- Marginal Analysis
- Equilibrium and Disequilibrium
- Markets – Interactions and Structures
- Elasticity
- Efficiency
- Comparative Advantage
- Real versus Nominal
- Cumulative Causation.

There has been some criticism of the threshold concept approach in economics (O’Donnell 2010; Tang and Robinson 2010). However, published work in books such as Davies (2012), tertiary regulations such as QAA (2007, 2015), and journal articles such as Shanahan, Foster and Meyer (2006), Cousin (2006), Davies and Mangan (2007), Hedges (2014), Shanahan (2016) and Meyer (2016) highlight the acceptance of both the list of threshold concepts, as well as this approach to pedagogy in economics.

While *Economics Standards for Australian Higher Education* (Australian Business Deans Council, 2013) exist, this contrasts with the UK framework (QAA, 2015). Unlike the UK framework, the Australian standards are not explicitly framed around transferrable threshold concepts. The five pillars of content of the Australian framework are: knowledge, application, data analysis, communication and reflection. In contrast, the UK framework explicitly lists what it terms ‘the transferable concepts’, which are indeed the threshold concepts of economics listed by the ETC Project. Thus, the UK framework enlightened me with an avenue for my research to embed the ‘why’ and the ‘how’ of learning and teaching economics via attention to these transferrable concepts – the threshold concepts of economics.

In this study, I draw upon the agreed upon threshold concepts of economics by the ETC Project as reported by Davies and Mangan (2005). In the context of my study, the chosen course, the entry-level, *Microeconomic Principles*, has learning outcomes that are designed to meet the overall program learning outcomes of the different degrees in the business faculty. This is the case for all individual courses (subjects) with a degree program at my university. The rationale for utilising the agreed upon threshold concepts to meet program level learning outcomes for an entire degree is encapsulated in the UK framework (QAA, 2015). In other words, attention to the threshold concepts of economics as reported by Davies and Mangan (2005) and QAA (2015) in an introductory economics unit would be appropriate in the context of an overall degree program.

In this study, I only draw upon the threshold concepts of economics, without drawing upon threshold concepts of other disciplines. The aim of this study is to investigate how the threshold concepts of economics can assist in the pre-determined learning outcomes of a course – to view the world through the lens of an economist. As the chosen course, *Microeconomic Principles*, is a service course in several degree program in the Faculty of Business, I was unable to alter the learning outcomes of the course by incorporating other threshold concepts beyond the discipline of economics. As this is an entry-level course, the Australian Qualifications Framework (AQF) does not recommend that emphasis is to be placed on the highest level of learning in Bloom’s taxonomy, which is to create new knowledge. As such, the capacity for students to research is not a learning outcome of this course.

Threshold concepts in economics curricula

The University of Auckland re-thought their economic curriculum around the threshold concepts of economics (Hedges and Pacheco 2015). These curriculum designers aimed to adopt a ‘less-is-more’ approach to cater to a diverse student cohort. To invigorate the curriculum, the designers

recognised that their curriculum would need to be framed around the threshold concepts of economics. Unlike these researchers, my research does not address the ‘*what*’ of teaching and learning economics. Rather, my research investigates whether attention to threshold concepts when designing a curriculum can help learners realise the ‘*why*’ of learning economics (Burdina and Sasser 2018), and thus improve the student learning experience as well as student learning outcomes for a given set of curriculum content.

The aim of my curriculum design was to integrate all the threshold concepts of economics into an already existing curriculum¹², as well as integrate the lens of threshold concepts into every learning and teaching activity. This would then present the ‘*why*’ of learning economics to engage students throughout the semester. As the threshold concepts agreed upon by the ETC Project are discussed in the literature (Cousin 2006; Shanahan, Foster and Meyer 2006; Hedges and Pacheco 2015; Shanahan 2016; Meyer 2016), I utilised this list of threshold concepts to transform the curriculum of this entry-level microeconomics course by integrating these threshold concepts. The objectives were to (1) enhance the student learning and experience, and (2) enhance the student learning outcomes of this course.

Another facet of my curriculum design was to facilitate learners to be able to apply the threshold concepts in their daily lives (Bajada, *et. al.*, 2016), as well as utilise the threshold concepts in evaluative and critical thinking. I thus explored the literature on learning taxonomies to help inform me about how I would help navigate learners from base-level knowledge to higher level thinking. The exploration of this research then helped provide me the ideas about how to embed the ‘*how*’ of learning economics into my course’s curriculum.

Learning taxonomies

Learning taxonomies are classifications of learning (Bloom, 1956). These classifications help describe the different forms and types of learning behaviours. They can be a useful framework for educators and curriculum designers to identify and differentiate between contrasting levels of learner cognition. Educators and curriculum designers can use these taxonomies to identify and

¹² The scope of this microeconomics syllabus did not allow me to address the threshold concepts of: *real versus nominal* and *cumulative causation*.

This is because the syllabus content pertaining to these threshold concepts is covered in the complementary macroeconomics syllabus instead of the microeconomics syllabus. The macroeconomics course is beyond the scope of this research project where I solely focus on the microeconomics course in our current research.

differentiate cognition from lower-level learning to higher-level learning – navigating upwards from *remember*, *understand*, *apply*, *analyse*, *evaluate* to *create* (Anderson, Krathwohl, *et. al.*, 2001) (see Figure 2).

Learning can begin with the memorisation of a fact that is not even understood, to understanding that fact, to applying that fact to solve a problem, all the way to utilising that fact to evaluate a scenario and to create new knowledge. Thus, learning taxonomies are useful in the development of curriculum material such as learning and teaching activities, as well as assessments (Huntley, Engelbrecht and Harding, 2009).

Bloom's Taxonomy of Educational Objectives (Bloom, 1956) is the seminal learning taxonomy. According to Bloom, a learner needs to master each level before they can move up to the next. Anderson, Krathwohl *et. al.* (2001) revised Bloom's Taxonomy, and this revision is presented in Figure 2. The revision was intended to update the taxonomy with the fifty years of innovations on learning and teaching since the original taxonomy.

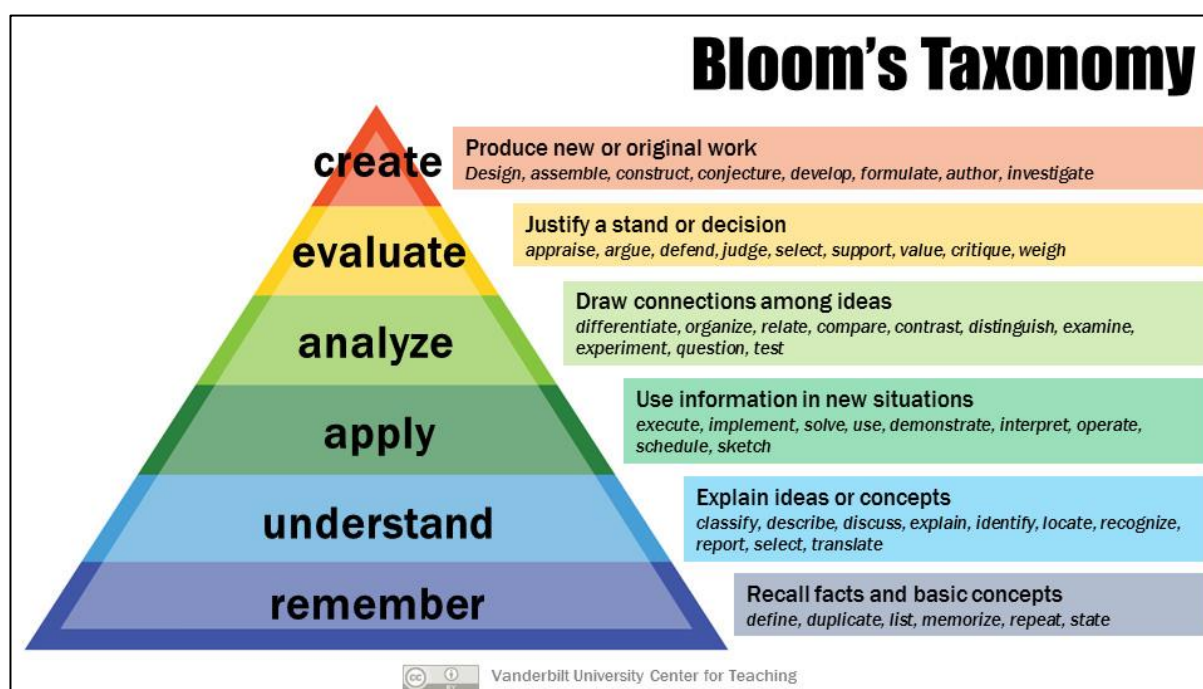


Figure 2: The revised Bloom's Taxonomy (Anderson, Krathwohl, *et. al.*, 2001).

Source: Centre for Teaching, Vanderbilt University, Nashville, Tennessee, U.S.A.

Other notable taxonomies in the literature include: the SOLO (structure of observed learning outcomes) taxonomy (Biggs and Collis, 1989); the six facets of understanding (Wiggins and McTighe, 1998); and the taxonomy of significant learning (Fink, 2003).

The SOLO taxonomy is hierarchical, which is similar to Bloom's taxonomy. The fact that it is hierarchical would make it easier for assessors to gauge the level at which a student has achieved a learning outcome. In terms of accreditation, hierarchical taxonomies lend themselves to be the best fit when marrying the higher education sectors objective of delivering learning outcomes, as well as reporting to accrediting and regulatory authorities. However, the hierarchical nature of these taxonomies does not take integrative or ongoing learning journeys into account. The advantage of the six facets of understanding (Wiggins and McTighe, 1998) is that this is a cyclical approach to learning taxonomies, recognising that the learning consists of a journey of acquiring concept after concept in each iteration of the cycle. The taxonomy of significant learning (Fink, 2003) has the benefit of recognising that learning is interactive and that each kind of learning will be able to stimulate other kinds of learning.

I decided to utilise Bloom's taxonomy as the tool to help me scaffold the learning and teaching activities of my microeconomics curriculum. Utilising Bloom's taxonomy compared to other taxonomies made sense to me because the Australian Qualifications Framework (AQF)¹³ implicitly utilises the language of this taxonomy. Thus, in terms of regulatory compliance and ease for auditing purposes, Bloom's taxonomy became a natural fit. Due to the AQF, Bloom's taxonomy is the most common learning taxonomy that is utilised by universities. In meeting the regulatory requirements of the AQF, Australian higher education institutions are implicitly following Bloom's taxonomy which is the basis of the AQF. Furthermore, during the period of study, my university was undergoing the processes required for an external accreditation by the Association to Advance Collegiate Schools of Business (AACSB)¹⁴. The AACSB accreditation requires an assurance of student learning, which has rubrics that we as subject co-ordinators need to attest to. The language of these rubrics is also implicitly based on the language of Bloom's taxonomy. While attention to such a learning taxonomy helped me embed the '*how*' of learning economics into my curriculum, attention to the threshold concepts of economics helped me embed the '*why*' of learning economics into my curriculum.

¹³ Available at: <https://www.aqf.edu.au/>

¹⁴ Available at: <https://www.aacsb.edu/>

The ‘*why*’ of learning economics

One way to integrate the ‘*why*’ of learning economics is to build an economics curriculum that focuses on the threshold concepts of economics, the transformative and integrative concepts that are the lens of seeing the world through the eyes of each discipline (Meyer and Land, 2003).

My research *transforms* a traditional economics curriculum that is built on the foundational concepts approach by re-sequencing this content according to the threshold concepts. It aims to explore student learning outcomes as well as the student learning experience by transforming the way this curriculum is sequenced and delivered.

I identified where each of the threshold concepts of economics are best engaged in the pre-determined content of this course, so I was then able to re-sequence the curriculum. The result was a curriculum whose teaching sequence and learning progression was guided by the learning outputs – the threshold concepts of economics, rather than a teaching sequence and learning progression that was guided by the building blocks (foundational concepts). The foundational concepts approach places the easiest ideas towards the beginning of the course, whereas the threshold concepts approach places the hardest ideas towards the beginning.

I did not alter the quality or the quantity of the course’s pre-determined content. Instead, the motivation of this research was to re-think the teaching sequence and the learning progression throughout the semester. This re-design of the teaching sequence was brought about by utilising the lens of threshold concepts itself to transform the course’s curriculum.

The ‘*how*’ of learning economics

While threshold concepts are useful in articulating the ‘*why*’ of learning economics, students receive a transformative learning experience when we equip them with tools concerning the ‘*how*’ of learning. Utilising the threshold concepts framework in a constructively aligned assessment program assists in students acquiring these concepts and have a transformational learning experience (Hedges, 2014).

In Chapter 3, I discuss how I transformed the learning and teaching activities of my course’s curriculum to navigate students from base-level learning to higher-level learning. To ensure that

the curriculum is designed to transform the learner, every learning and teaching activity is constructed around the revised Bloom's Taxonomy (Anderson, Krathwohl, *et. al.*, 2001). A similar framework is outlined by Huntley, Engelbrecht, and Harding (2009) which outlines an assessment component taxonomy for mathematics where the tasks are hierarchically organised according to the level of cognition that is required.

Lectures, tutorials and the assignment are structured around the theme: *R.E.A.L.* Here, every activity in this course is broken into four parts, where each part gets progressively more challenging and involves higher-level thinking, progressively working through the revised Bloom's Taxonomy in Figure 2 around the acronym, *R.E.A.L.*:

'R' – *Re-cap and Remind*, where students are to recall the concepts covered that week (or the previous week) – *Remember* in the revised Bloom's taxonomy in Figure 2;

'E' – *Economics Everyday*, where students can engage with and relate to these concepts by connecting them to examples or scenarios they experience every day – *Understand* in Figure 2;

'A' – *Application and Awareness*, where students take their knowledge further by applying these concepts to a different, but a practical and contemporary scenario, thus providing an understanding of their learned expertise in a broader context – *Apply* and *Analyse* in Figure 2;

'L' – *Learning Life Lessons*, which is an evaluative exercise, encouraging informed critique, on a contemporary social issue, that builds on research-led, discipline-specific content – *Evaluate* and *Create* in Figure 2. This is the last activity for the tutorial, where students are encouraged to critically evaluate a contemporary economic scenario by creatively utilising the concepts and content of the prior week's lectures.

This *R.E.A.L. framework* systematically equips the learner to progress to the highest level of learning according to the revised Bloom's taxonomy – *Evaluate* and *Create*. This structure also fosters a program-based curriculum. When students attempt the challenging material in *Learning Life Lessons* they are equipped with the 'how' of tackling higher-level courses in their degree programs. With this scaffolding, students are thus equipped with generic work and life skills to apply to their work, career and entrepreneurial endeavours – the transformative and integrative features of threshold concepts. Thus, students engage themselves in the subject as the learning and teaching activities explicitly highlight and work towards the 'why' of their learning.

The choice of the acronym, *R.E.A.L.* is deliberate. By incorporating this acronym into the scaffold of the learning and teaching activities, it aims to be deliberate about making economics ‘real’ to the students. As discussed earlier in this thesis, economics tends to be a core course in a business faculty, while only a limited number of students would decide to major in the subject. The course is usually the one that students would find the most abstract in their first year of study. Thus, the advantage of using *R.E.A.L.* each week is to signal how ‘real’ economics is to the students, and activate the threshold concepts of economics – to allow students to see through the eyes of an economist.

Once the threshold concepts are identified in lectures, they need to be strategically integrated into the course’s tutorials. Here, my research is informed by Davies and Mangan (2008). I developed three types of activities: ‘reflective exercises’, ‘problem-focused exercises’ and ‘threshold network exercises’. I incorporated the exercises of Davies and Mangan (2008) into a revision of Bloom’s Taxonomy (Anderson, Krathwohl, *et. al.*, 2001), to create a scaffolding for the teaching of economics in tutorials:

- ‘*Re-cap and Remind*’ – informed by the ‘reflective exercises’ of Davies and Mangan (2008),
- ‘*Economics Everyday*’,
- ‘*Application and Awareness*’ – informed by the ‘problem-focused exercises’ of Davies and Mangan.
- ‘*Learning Life Lessons*’ – informed by the aforementioned ‘threshold network exercises’ of Davies and Mangan.

I represent this scaffolding of tutorials to engage the threshold concepts of economics as the *R.E.A.L. framework* for the learning and teaching of economics. Here, ‘*R.E.A.L.*’ stands for – Re-cap and remind; Economics every day; Application and awareness; Learning life lessons. This framework gradually and methodically equips the learner with the ‘*how*’ of learning economics, allowing a learning progression from base-level learning to evaluative and critical thinking within the discipline of economics.

In the final chapter of this thesis, I discuss how these two innovations – the incorporation of threshold concepts and the scaffolding of the *R.E.A.L. framework* work in a synergetic way to deliver improvements in learning outcomes and the learning experience. In the final chapter, I also investigate if the scaffolding has value, independent of the incorporation of threshold concepts.

Motivation

The preceding discussion suggests there is a pedagogic need to transform the economics curriculum. Further evidence can be seen in the UK economics curriculum framework, which is explicitly formulated around the threshold concepts of economics (QAA, 2015).

By looking at the literature on threshold concepts in economics to date, my research proposes and develops a transformed curriculum design for an existing higher education, entry-level economic course by integrating threshold concepts. The motivation of this curriculum re-design around threshold concepts is to cater to a diverse cohort by: (1) improving the student learning experience and (2) improving the intended learning outcomes of the course. Thus, this thesis proposes and illustrates that an explicit re-design of an entry-level economic course's given content around threshold concepts and learning taxonomies should result in an enhanced student experience for entry-level economics students as well as enhanced learning outcomes.

This is the first comprehensive study to apply a curriculum re-design based on threshold concepts across an entry-level economics course. This study is unique in that I incorporated all the threshold concepts of economics that are relevant to a microeconomics curriculum into a single course, as well as integrate threshold concepts into every learning and teaching activity and assessment task. I also used the lens of threshold concepts to re-sequence the traditional teaching sequence of microeconomics to create a transformed teaching sequence – a sequence based on threshold concepts that highlights the 'why' of teaching economics. Within this transformed teaching sequence, each week's learning and teaching activities such as each week's tutorial are scaffolded according to a four-step framework that I have created: *R.E.A.L.* This *R.E.A.L. framework* is informed by the tutorial exercises of Davies and Mangan (2008) and structured according to the revised Bloom's taxonomy of Anderson, Krathwohl, *et. al.*, (2001). The outcomes of this research could help academics in economics to transform economics curricula by giving them the tools to embed the 'why' and the 'how' of learning and teaching economics into their curricula and deliver transformative learning experiences for students in economics courses.

Introductory chapter part 2 of 2

– context, methodology, and data

Context of my research

An entry-level (first-year) microeconomics course at an Australian university was transformed and investigated over four semesters of study by integrating threshold concepts, and by transforming the teaching sequence. In the Faculty of Business at this university, all undergraduate students are required to take this entry-level microeconomics course. These degrees include the bachelor's degrees of: Actuarial Studies, Applied Finance, Business Analytics, Business Administration, Business Leadership, Economics, Commerce, and Marketing and Media. Of these degrees, the only one where students can choose a major is the Bachelor of Commerce, where students can choose from a range of majors: accounting, business information systems, decision science, economics, entrepreneurship, finance, human resources, international business and marketing. The different degree programs and the different majors attract students with different motivations for studying economics. These students also come from diverse academic backgrounds, due to the subjects studied in secondary education, as well as the differing entry criteria into each of these programs. In addition, these students come from diverse demographic backgrounds due to the high proportion of international students at this university (Karunaratne, Breyer and Wood, 2016). In Australia, the diversity in international students results in diverse student aspirations and hence students' choice of occupation (De Alwis, S., and Parr, N., 2018)

Over the years, this entry-level economics course has grown from approximately 1,000 students in 2007, to 2,000 students in 2010, and 3,000 students in 2017. The highly theoretical and often abstract concepts in microeconomics are challenging for this large and diverse student cohort. Thus, I utilise my teaching philosophy to inspire, motivate and engage this cohort by emphasising the 'why', and by focusing on the 'how' of learning. To achieve these objectives, the curriculum has been re-designed by underpinning the curriculum around research including: threshold concepts by Meyer and Land (2003) and Davies (2012), learning taxonomies by Anderson, Krathwohl, *et. al.* (2001), and constructive alignment by Biggs (1996).

I integrated the previous research on threshold concepts in economics curricula into a single curriculum, including lectures, tutorials, assessments, and feedback. I did not change the content that is delivered in this microeconomics course because it is a service course for the Faculty of Business; that is, it is a core course for students of all majors. The content of each service course is decided at a faculty level, thus any changes to the content needs to be executed at the program level. This research takes the content as given and formulates a unique approach to delivery, emphasis and sequencing, by focusing on threshold concepts and learning taxonomies.

A sample *Unit Guide*, which is the document that outlines the structure, governance and running of the entire course is presented in the Thesis Appendix A.

Lectures

My curriculum design relies on the agreed-upon threshold concepts of economics in Davies and Mangan (2005), which were incorporated into lectures. The relevant concepts are introduced at the beginning of lectures and the *R.E.A.L. framework* helps students to engage with these concepts and navigate through the lecture content.

Tutorials

While the lecture is the part of a curriculum where most of the content is introduced, the rest of the learning is delivered via a moderated group discussion to further engage the threshold concepts– within tutorials. For example, *Economics models* is an agreed-upon threshold concept of economics (QAA, 2015; Davies and Mangan, 2005). Content that allows students to critique and question different economic models, as well as decide which models need to be applied to which real-world situation, is more engaging in a small group discussion (Davies and Mangan, 2005). Students can argue their case with peers, with the facilitation of this discussion by their tutors. Rather than the lecturer critiquing the model for the student, and the lecturer directing how each model fits a specific real-world application, students are presented with examples and case studies in tutorials (O'Donnell, 2010). They can then engage with this concept in small groups, by discussing why (or why not) each model fits a particular scenario and critically review the model's assumptions for that case. This pedagogical approach is appropriate for engaging a diverse student cohort (Meyer and Land, 2005).

Therefore, once the threshold concepts are identified in lectures, they need to be strategically integrated into the course's tutorials. Effective tutorial programs are an essential key to student success (Oates, *et. al.*, 2005). Here, our research is informed by Davies and Mangan (2008), who developed three types of activities: 'reflective exercises', 'problem-focused exercises' and 'threshold network exercises'. I scaffolded their approach within tutorials in four steps, informed by a revision of Bloom's Taxonomy (Anderson, Krathwohl, *et. al.*, 2001). In my curriculum design, students are explicitly made aware of the *R.E.A.L. framework* via the structure of each week's tutorial

The assignment

The *R.E.A.L. framework* was again explicitly used to scaffold the student's within-semester take-home assignment. According to the research of Boud (2000), assessments are *for* learning as opposed to solely being assessments *of* learning. Rowntree (1987) notes that the assessment program needs to be a key teaching tool instead of acting primarily as a measurement tool. Similarly, Gibbs (1999) proposes that the goal of assessments is to use the tasks to encourage engagement and integrative learning.

The assignment is designed in such a way as to allow learners to connect the various economic concepts and models, and to assess deeper understanding. The language used in the assignment is informed by the research of Dyer (2013) for the framing of assessment questions without comprising on their rigour or quality. Personal reflection and application of knowledge in the take-home assignment allows the student to view the presented problems with the required lenses and gateways of thinking and practice (Meyer and Land, 2003).

Weekly quizzes

Weekly quizzes were utilised to re-cap and remind students about the course's weekly content, building upon the first tier of the *R.E.A.L. framework* – 're-cap and remind'. My study is informed by the work of Shanahan, Foster and Meyer (2010) where students were given weekly multiple-choice quizzes to examine the acquisition of the basic content of the prior week's tutorial.

The final examination

The largest component of judgment of a student's achievement of a course's learning outcomes is via a final examination. Threshold concepts are integrated into the final exam, by presenting 60% of the final examination paper as unseen questions based on a seen case study. Here students must

utilise the lens of the threshold concepts themselves prior to the examination and view the world as an economist; that is, students are encouraged to foresee the questions that economists would tend to ask when viewing with the lenses of these concepts. Thus, this draws upon the evaluative ‘threshold network exercises’ of Davies and Mangan (2008).

Making economics *R.E.A.L.*

In Chapter 3, I exhibit samples of a *R.E.A.L.* lecture, a *R.E.A.L.* tutorial, and a *R.E.A.L.* assignment. All the exhibited learning and teaching activities were utilised in the delivery of this microeconomics course during the timeframe of the study.

The *R.E.A.L.* lecture that is presented is the traditional microeconomics topic of *Producer Choices and Constraints*. This is the topic where students are introduced to the various production and cost functions of a firm. The topic is generally considered to be cognitively challenging as the coverage involves prose and mathematics as well as graphs. By focusing on the threshold concepts of *Marginal Analysis* and *Economics Models*, and utilising the *R.E.A.L. framework*, my curriculum design aimed to make the lecture a transformative experience for the learner.

The *R.E.A.L.* tutorial that is presented is about specialisation and the associated gains from trade. The threshold concepts of economics that are engaged in this tutorial are: *Marginal Analysis* and *Economic Models* as well as *Comparative Advantage*. By underpinning the tutorial on these concepts and gradually navigating the learner from base-level learning to higher-level learning in Bloom’s taxonomy using the *R.E.A.L. framework*, our curriculum design aimed to create an engaging tutorial where students are equipped to take part in contemporary discussions about protection versus free trade.

The *R.E.A.L.* assignment that is presented was aimed to assess student understanding at all levels of Bloom’s taxonomy. Through purposefully structuring the assignment around the *R.E.A.L. framework*, learners are encouraged to be engaged with economics in their everyday lives. The assignment is designed as a tool *for* learning, rather than a tool that is solely *of* learning. After completing the assignment, students should be able to see through the portal and gateway of thinking that is discussed in Meyer and Land (2003) – seeing the world through the eyes of an

economist – specifically, seeing the markets that students interact with in their everyday lives through the eyes of an economist.

Methodology

Aim

The aim of this curriculum design is to re-design an existing entry-level economics curriculum to cater to a large and diverse student cohort, where the existing curriculum was designed with a structure that revolved around the content of economics. By purposely sequencing content around the threshold concepts, all the learning and teaching activities in the course will implicitly and explicitly work towards inviting students to cross the liminal boundary and walk through the gateway of thinking like an economist, and thus achieve improved learning outcomes.

Sample set

In my role as the course co-ordinator in the first-year course, *Microeconomic Principles* – ECON111 at Macquarie University, I transformed the economics curricula over four semesters study, by integrating threshold concepts. This sample was chosen as it embodied a diverse academic cohort where all undergraduate students in the university's Faculty of Business are required to take the course of ECON111 as part of their program. Furthermore, the course entails a large sample size, with enrolments in the course being approximately 1,400 students per semester.

Course content

As mentioned previously, the quantity and the quality of the content of the course was kept unchanged during the period of study. Moderation by the Department of Economics, and the designation of a specific moderator, ensured that the content, quality and academic rigour of the course remained unchanged from the previous curriculum. Further details on the strict academic standards in integral components of the course are detailed below:

- Lectures – The lecture coverage in terms of content was identical to the previous offerings of ECON111. However, there was a change in the sequencing of the lectures (discussed in Chapter 1 and elaborated on in Chapter 2) to explicitly guide the content via the threshold concepts of economics.

- Tutorials – Tutorial questions were drawn from the database of tutorial questions from the past offerings of the course. However, the tutorial questions were updated with contemporary examples and current news to engage and highlight the threshold concepts of economics, and the tutorial questions were scaffolded according to the revised Bloom’s taxonomy.
- The assignment – Due to a re-sequencing of the lecture topics, the assignment could explicitly engage the threshold concepts of economics, encouraging students to apply them to the provided questions and stimuli.
- The final exam – The quality of the exam was identical to the previous offerings of the course; this was ensured by the course moderator. As the curriculum had been transformed, the final exam now included the explicit use of case studies, unlike in previous offerings, to encourage students to apply the threshold concepts.

Utilising my lens of threshold concepts, the aforementioned literature review, as well as the benchmark UK economic framework, I executed four pedagogical approaches to assist a diverse cohort of students through:

- An incorporation of all of the threshold concepts of economics that are relevant to a microeconomics curriculum.
- A transformation of the sequence of topics, to explicitly integrate threshold concepts – to both engage students and provide opportunities for the application of these threshold concepts.
- A transformation of the learning and teaching activities around the *R.E.A.L. framework* – to bring the application of knowledge to the fore, to both engage and assist students throughout the semester.
- A transformation of assessments from ‘assessments *of* learning’ to ‘assessments *for* learning’ – to engage students and give them opportunities to apply the threshold concepts in economics.

Curriculum re-design

Through my experience in lecturing the course, I was able to identify where the threshold concepts are best exemplified in the existing legacy content of ECON111 and then utilised this knowledge to re-sequence the curriculum of ECON111. Prior to these offerings of ECON111, I had already trialled the curriculum sequence discussed in Chapter 1 in a summer semester offering with success both in terms of the student experience survey results as well as the overall grade distribution and hence learning outcomes. I worked through the lecture content of the past offerings of the content of the course and restructured the weekly curriculum schedule as discussed

in Chapter 1, and the economics pedagogy behind this re-sequencing is discussed in detail in Chapter 2.

Control and experiment

During the four semesters of the period of research, a natural experiment resulted which assisted in controlling the impact of the re-sequencing of the content based on threshold concepts, from the impact of integrating threshold concepts via the *R.E.A.L. framework*. One semester during this period, which I will call: *Semester A*, ran in the traditional sequence of topics, even though threshold concepts were integrated into the curriculum via the *R.E.A.L. framework*. Whereas three of the semesters in the period of research, which I will call: *Semester X*, *Semester Y*, and *Semester Z*, ran in the transformed re-sequencing of topics, with threshold concepts integrated into the curriculum. Thus, while all four semesters during the research period involved the integration of threshold concepts into the curriculum, only three of the four semesters experienced a transformed curriculum sequencing. For comparison purposes I use one semester before the study period, which I call *Semester N*. In *Semester N*, threshold concepts were neither integrated into the curriculum, nor was the curriculum re-sequenced for threshold concepts.

Across all *Semesters N*, *X*, *Y*, *Z*, and *A*, the content covered was identical, the course convenor (co-ordinator) was identical, the lecturers were identical, and the team of tutors was similar. The integrity of the curriculum's content, the teaching activities, and the assessment, was ensured by a rigorous moderation process which exists within the economics department, independent of this research. Nevertheless, each semester has a new cohort of students so whilst I have controlled as much as possible, there will still be some variation in the cohorts.

Data

I transformed the curriculum of this entry-level microeconomics course via the integration of all the relevant threshold concepts, re-sequencing the course's content according to these threshold concepts, and scaffolding each week's learning and teaching activities according to the *R.E.A.L. framework*. The objective was to: (1) enhance the student learning and experience, and (2) enhance the student learning outcomes of the course. These are the two metrics that can be used to evaluate the effectiveness of a transformed and re-designed curriculum. Furthermore, a third metric was used to assess the student voice.

Hedges and Webber (2014) shows how student evaluation surveys of courses are useful in identifying areas of strength and weakness for both instructors and entire departments. In my research, each semester, a student survey was conducted to gauge their experience of the curriculum re-design. The first survey consisted of 22 questions, which involved both Likert-scale ranking questions as well as open-ended free response questions. The survey questions as well as average results for a sample semester are presented in the Thesis Appendix B.

To elicit the student voice, they were presented with another survey consisting of the list of threshold concepts and they were asked to list five concepts that they deemed ‘essential’ in the learning of economics, as well as list five concepts that they deemed ‘difficult’.

To assess student learning outcomes, I relied on my university’s grading system. Insofar as the curriculum is constructively aligned (Biggs, 1996), the student attainment of learning outcomes – at the levels described by the university’s grading system – helped me gauge the level at which student learning outcomes were achieved.

The ethics approvals for this research can be found in Thesis Appendix C.

Results

In Chapter 1 through Chapter 4 I demonstrate that the transformed curriculum does deliver a significant impact. There is a significant improvement in the student learning experience, and there is a significant improvement in student learning outcomes. Furthermore, the student voice indicates that the curriculum design enables students to address the troublesome nature of the threshold concepts of economics.

Reflections

The thinking on threshold concepts has evolved over the last decade and the approach has been utilised in the transforming and integration into contemporary curricula in various disciplines across the arts, sciences and business fields. For any discipline, the recognition of the existence of

threshold concepts has the potential to assist in both the learning and teaching facets of higher education. An understanding by practitioners of the existence of threshold concepts can address some common student issues regarding the attainment of learning outcomes.

One such learning issue across disciplines is the issue of the application of discipline-specific knowledge. Students may acquire the discipline's formal knowledge but may then be unable to use this knowledge when it comes to its application within the discipline itself. In addition to this, learners may be unable to apply this knowledge to discipline-related phenomena in the real world.

Thus, the recognition of the existence of threshold concepts can assist in a common learning issue; that is, that some students struggle with fully understanding the underlying theories of a discipline. These students therefore regurgitate rote-learned isolated nodes pertaining to their discipline. As the learners have rote-learned isolated nodes of the discipline, they are then unable to effectively amalgamate the discipline-specific content.

As discussed in this chapter, without attaining the discipline's threshold concepts, learners are left in a limbo state of understanding. While they may possess discipline-specific knowledge and content, they are unable to either utilise this knowledge in a transformative way or utilise this knowledge in an integrative way. Thus, threshold concepts can be the benchmarking criteria for the development of curricula, the strategising of teaching, as well as the achievement of learning outcomes. Furthermore, learning taxonomies can help navigate a student to utilise these threshold concepts in evaluative and critical thinking.

In order to determine whether threshold concepts can assist lecturers in higher education, each discipline must initially identify the threshold concepts that in fact apply to their discipline. According to Davies (2006), the process of identifying threshold concepts is inherently a cumbersome task.

Tertiary economics curricula have been proven to be homogeneous across both institutions and over time. Such homogeneity does not imply a flaw in the curriculum design. However, rather than accepting the status quo economics curricula, improvements can be made by explicitly modelling tertiary curricula around threshold concepts.

Furthermore, it is questionable whether the current homogeneity of economics curricula, as well as curricula being developed without threshold concepts in mind, is indeed best practice. While there are threshold concepts in economics, the current practice is that these are not explicitly addressed in entry-level economics courses. These concepts are scattered throughout the various content modules of current economics curricula. Thus, they are presented to students in an implicit rather than an explicit sense. The disadvantage of this approach is that the targeted student cohort is never presented with an opportunity to grasp each threshold concept itself, with the result that they are neither able to understand the presented theory of a module, nor are they able to apply their knowledge in varying circumstances and scenarios.

By looking at the literature on threshold concepts in economics to date, this thesis proposes the development of the entire entry-level economic curriculum with the framework of threshold concepts and learning taxonomies in mind. This should result in enhanced learning experiences and enhanced learning outcomes for entry-level economics students.

This research also presents evidence via the student voice that sequencing a course around the threshold concepts, rather than the foundational concepts, has the potential to make difficult concepts easier for students, without changing their perceptions of the important concepts of economics.

The research in this thesis on applying the threshold concept framework will be useful to curriculum developers. It provides curriculum developers with the tools to re-imagine the traditional presentation of their content. The research in this thesis on the *R.E.A.L. framework* will also be useful to curriculum developers. This scaffolding mechanism in learning and teaching activities to integrate the threshold concepts of economics could prove to be a useful tool for both learners and teachers alike.

I utilised four approaches to assist and engage a diverse cohort via a transformation of the curriculum around threshold concepts. This incorporated:

- An incorporation of all the threshold concepts that are relevant to a microeconomics curriculum.
- A transformation of the sequence of topics, by explicitly integrating threshold concepts.
- A transformation of the learning and teaching activities, by highlighting the threshold concepts of economics, and scaffolding the learning of these via the *R.E.A.L. framework*.
- A transformation of assessments from an assessment *of* learning to an assessment *for* learning, by giving students the opportunity to apply their knowledge.

In Chapter 1, I provide an initial introduction of incorporating the threshold concept framework and the *R.E.A.L. framework* into my curriculum design. In Chapter 2, I elaborate on the threshold concept framework and its impact, and in Chapter 3, I elaborate on the *R.E.A.L. framework* and its impact. In Chapter 4, I apply and test two alternative economic curriculum frameworks around threshold concepts – one that integrates threshold concepts into an existing economics curriculum, and one that goes further by transforming the curriculum by re-sequencing the content. I show that the utilisation of threshold concepts in both curriculum frameworks does improve both the student learning experience as well as the learning outcomes. However, the transformation of the entire curriculum sequencing for threshold concepts has a better impact on the student learning experience and the learning outcomes compared to only integrating threshold concepts into an existing curriculum.

The result was: (1) an improvement in the student learning experience indicated by the student surveys, as well as (2) an improvement in student learning outcomes indicated by the improved grade distribution. The student survey results indicate that, compared to previous offerings, the new curriculum is more organised in a way that promotes student learning, offers face-to-face sessions that are more engaging, has assessments that are more effective in developing student understanding, contributes more to the development of their graduate capabilities, and the course is more intellectually challenging.

Thus, the curriculum that has been transformed by integrating threshold concepts is now more engaging for the diverse cohort, while still maintaining the quality and rigour of the course's existing legacy content. In summary, the curriculum transformation promotes an enhanced student experience and enhanced learning outcomes, by making the course more engaging for a diverse

cohort – engaging students with the ‘*why*’ of learning economics, and equipping students with the ‘*how*’ of learning economics.

The thesis

After this introductory chapter, this thesis consists of four chapters, followed by a concluding chapter. I briefly outline the contents of each chapter below.

In Chapter 1 – *Transformative learning and teaching in economics – why, what, how and for whom?* – I introduce the four key innovations to the curriculum:

- Integrating all of the threshold concepts of economics that are relevant to an introductory microeconomics curriculum,
- Re-sequencing the economics curriculum with an eye for the threshold concepts of economics – engaging students with the ‘*why*’ of learning economics.
- Scaffolding the learning and teaching activities of the curriculum around an application of learning taxonomies according to the *R.E.A.L. framework*,
- Utilising assessments for learning, rather than purely using assessments of learning – equipping students with the ‘*how*’ of learning economics.

In Chapter 2 and Chapter 3 I discuss the two arms of these innovations – the ‘*why*’ of learning and teaching economics, and the ‘*how*’ of learning and teaching economics.

In Chapter 2 – *Transforming the economics curriculum by integrating threshold concepts*– I explore the literature on threshold concepts as well as the literature on curriculum re-design to re-sequence the traditional mainstream introductory microeconomics curriculum. This re-sequencing utilised the threshold concepts of economics to guide the sequencing of weekly topics while maintaining the traditional mainstream content of the curriculum. I discuss extensively the economics pedagogy behind the re-sequencing of topics, and how this re-sequencing can engage students in the ‘*why*’ of learning economics. In this chapter, I also present statistical tests on both the student learning experience and the learning outcomes. I found that there are significant improvements in both these metrics because of the innovations discussed across this thesis.

In Chapter 3 — *Making economics R.E.A.L. – a scaffolding for engaging, equipping and empowering students in economics* I explore the literature on learner transitions to university as well as that on learning taxonomies, to create a four-step scaffolding that I term the *R.E.A.L. framework*. This scaffolding is created by integrating the work of Davies and Mangan (2008) into the revised Bloom’s taxonomy to create four steps to navigate learners from base-level knowledge to higher level evaluative and critical thinking in economics. In this chapter I present samples of a *R.E.A.L.* lecture, a *R.E.A.L.* tutorial, as well as a *R.E.A.L.* assignment – learning and teaching activities than equip students with the ‘how’ of learning economics.

In Chapter 4 – *The ‘why’ and the ‘how’ of learning and teaching economics* – I disentangle the effects of the different curriculum innovations. A natural experiment resulted during the period of research where one semester of study ran with the traditional mainstream sequencing of topics – however, in this semester, I still incorporated the *R.E.A.L. framework* to integrate threshold concepts into the curriculum. In this chapter I compare and contrast the results of the student learning experience and the learning outcomes compared to the other semesters during the period of study, which not only underwent the incorporation of the *R.E.A.L. framework* but also underwent a transformed sequencing of weekly topics. I found that in all instances there were improvements in the student learning experience and improvements in the students learning outcomes. However, the semesters that had both the re-sequencing of weekly topics as well as the application of the *R.E.A.L. framework* experienced greater improvements in both the learning experience and the learning outcomes. This indicates that the ‘why’ and the ‘how’ of learning and teaching economics go hand-in-hand in creating an engaging economics curriculum, that equips learners with the threshold concepts of economics to empower them during their study, careers and beyond.

At the time of submitting this thesis, Chapter 2 has been published in a peer-reviewed journal, and Chapters 1, 3 and 4 have been submitted to other peer-reviewed journals where all these chapters are currently undergoing the review process. Details of these submissions are outlined at the beginning of each chapter.

To exhibit how the four chapters are part of a single research project, I present the thesis in a diagram of four quadrants in Figure 3. Each quadrant will be utilised as a visual before the beginning of each chapter.

The thesis



Figure 3: The thesis

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The thesis



Chapter 1: Transformative learning and teaching in economics – why, what, how and for whom?

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Statement of authorship:

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Chapter 1

1. Transformative learning and teaching in economics

– why, what, how and for whom?

Motivation: To embed the '*why*' and the '*how*' of learning and teaching economics into an economics curriculum.

Key literature: Threshold concepts | Teaching sequences
| Learner progression | Learning taxonomies

Innovation: I transformed an economics curriculum by integrating the '*why*' and the '*how*' of learning and teaching economics, to engage students to enhance their learning experiences and learning outcomes.

Chapter 1: Transformative learning and teaching in economics – why, what, how and for whom?

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Abstract

The challenge for university economics curriculum designers is to ensure that their entry-level course is relevant, interesting and engaging. To emphasise the ‘*why*’ of learning, we framed our teaching methodology on research into threshold concepts – emphasising the transferrable skills of economics. To incorporate the ‘*how*’ of learning, we developed a four-step pedagogy based on learning taxonomies. The course grades noted an improvement in the students’ learning outcomes. Student surveys indicated an improvement in the student learning experience. An engaging entry-level economics course is often the only exposure most business graduates have to the economics way of thinking and practice.

Keywords: threshold concepts; learning taxonomies; economics curriculum; learning and teaching; higher education

Chapter 1: Transformative learning and teaching in economics – why, what, how and for whom?

Introduction

Economics is relevant to everyone (Dwyer, 2017). Whether you are an agent in a household, a firm or the government, your life is affected by economic decisions. Economics is the study of how these agents, and their societies choose how to allocate their scarce resources in such a way as to maximise their wants. Broadly speaking, households want to maximise utility, firms want to maximise profits, and the government wants to maximise indicators of social welfare. Economics looks at how these agents respond to the incentives that they face, evaluate the costs and benefits, and make a choice that thus results in a trade-off. Economics also looks at whether these choices result in an efficient allocation, as well as whether these choices result in a fair allocation. As such, economics embodies useful concepts and frameworks to assist agents in making their decisions. Economics also empowers agents to make sense of the economic conditions and economic policies that affect their lives (Dwyer, 2017).

Due the pervasive relevance of economics, society would benefit if there was a rise in economic literacy. However, at both high school as well as university, while economics was once a popular subject of choice, that is no longer the case (Wilson, 2018). This lack of interest in economics has a direct impact on economic literacy, which in turn has an impact on society.

One way to address the lack of interest in studying economics is by attending to the economics curriculum design. The curriculum design could be explicitly framed on the ‘*why*’ of learning economics, and the ‘*how*’ of learning economics. Students learn best when they are inspired to learn – the ‘*why*’ about their learning (Becker, 2000). Students also learn best when teachers acknowledge that learning itself is a journey that requires tools to navigate – equipping students with the ‘*how*’ of learning (Boud, 2000). With first-year undergraduate economics students, imparting the ‘*why*’ about learning is challenging as these students may have a limited experience of the world beyond schooling. The ‘*how*’ to learn economics is also key, especially at university. The importance of assisting the transition to university is well documented in the literature (Kift,

et. al. 2010; Breyer and Wood, 2017). Embedding the ‘*why*’ and the ‘*how*’ into the curriculum would assist student transitions by enhancing their experience as well as their learning outcomes. However, there is little evidence that the economics curriculum has been designed around the ‘*why*’ and the ‘*how*’ of learning economics, instead economics curricula are built around the content of economics (Becker, 2000). Across the higher education sector, the entry-level undergraduate economics curriculum has been homogenous across institutions and across time (Becker, 2000; Alauddin and Valadkhani, 2009; Thornton 2012). This traditional undergraduate economics curriculum is built on foundational concepts, (Shanahan, 2016). Foundational concepts are building blocks that historically have been considered essential to the learning of economics. Traditional educational approaches suggest that there are concepts which are foundational or fundamental to the respective discipline. These foundational concepts are the initial stones that must be laid for the learner’s ongoing knowledge and application to be built upon. Shanahan (2016) argues that these traditional approaches are the existing approaches in economics curricula. The disadvantage of this foundational concept approach is that it removes the classroom discussion from the real world, (Davies and Mangan, 2005). As discussed in Hedges and Pacheco (2015, p. 54): *“fundamental concepts are considered ‘building blocks’ or ‘core ideas’ that are considered essential to progress learning in the discipline... Their use may result in a ‘theory first’ approach.”*

An alternative approach

One way to integrate the ‘*why*’ and the ‘*how*’ of learning economics, is to build an economics curriculum that focuses on the threshold concepts of economics. Threshold concepts are the transformative and integrative concepts that are the lens of seeing the world through the eyes of each discipline (Meyer and Land, 2003). The threshold concept approach to curriculum design explicitly focuses on building a curriculum around the learning outcomes – the learning outputs. On the other hand, the foundational concept approach to curriculum design explicitly focuses on building a curriculum around building blocks – the learning inputs.

The foundational concept approach focuses on the accumulation of inputs and eventually, the student achieves the learning output of the course – to see the world through the eyes of an economist. The threshold concept approach implies a curriculum that explicitly incorporates the learning outputs of a course at the beginning, rather than leaving these outputs towards the end of the course. This is particularly important in a service economics course in a faculty of business, as most students will only ever complete one introductory course in economics – not the whole

degree. Using the traditional approach, these students will never get to see the world through the lens of an economist as they will only be exposed to the initial ideas of economics. For example, in a traditional entry-level textbook, the first chapter usually presents the model of the Production Possibilities Frontier (PPF). Here, the example also tends to be traditional, where guns and butter are the two goods that are utilised to build the model. To illustrate the threshold concept of *opportunity cost*, the traditional approach would introduce opportunity cost as the amount of guns foregone to make a unit of butter, or the amount of butter foregone to make a unit of guns. The same scenario is traditionally used to explain the threshold concept of *marginal analysis*. The student is not able to attain the threshold concept and see through the eyes of an economist as the presentation is abstract and disconnected from the student's life experience.

To transform an economics curriculum requires curriculum developers to re-sequence this content, so that it engages the learning outputs of threshold concepts. This re-sequencing requires flipping the traditional sequence of topics in an economics curriculum – bringing the final topics to the beginning of the curriculum, and the initial topics to the end of the curriculum. With such a re-sequencing of the curriculum, learners are engaged with the learning outputs, i.e. the threshold concepts of a discipline, at the outset, and thus, learners are engaged in seeing the world through the eyes of an economist. Student interest is captured by initially focusing on the '*why*' of learning economics. *After* students begin to see the world through the eyes of an economist, learners can *then* be introduced to the inputs, i.e. the foundational concepts that are 'working behind the scenes'.

Introducing learners to the curriculum output at the outset, rather than the curriculum input, has the potential to engage students in the discipline of economics. Initial undergraduate economics courses in modern universities are mostly service courses that students are completing as part of a major in another discipline in a faculty of business, (Thornton, 2012). Seeing economics in practise in the real world at the beginning of a curriculum, rather than the foundational building blocks of theory, has the potential to promote interest and engagement in economics.

This research studies the transformation of a traditional economics curriculum by re-sequencing this content according to the threshold concepts of economics. The curriculum content and the subject learning outcomes are not changed, and we explore whether an explicit formulation of the curriculum around threshold concepts would improve student learning outcomes, as well as the student learning experience.

This research also integrates into a single curriculum, the previous research of threshold concepts in economics curricula. Each prior study of threshold concepts in an economics curriculum, addressed a specific part of the curriculum, such as: quiz design, assignment design, and learning activities. We integrate threshold concepts into every aspect of the economics curriculum, including: lectures, tutorials, assessments, and feedback. With regards to the discipline of economics, research is lacking on integrating threshold concepts into every element of an economics curriculum.

There is some critique, in working papers and conference presentations, of the threshold concept approach in economics (O'Donnell, 2010) as well as whether 'opportunity cost' is indeed a threshold concept (O'Donnell, 2010; Tang and Robinson, 2010). The main criticisms in this literature are about the way one would identify a threshold concept via the characteristics of a threshold concept. These authors argue that it would be difficult or arbitrary to identify threshold concepts when looking at characteristics of threshold concepts such as whether they are transformative or integrative.

However, published work in books such as Davies (2012), tertiary regulations such as QAA (2007), and journals such as Shanahan, *et. al.* (2006), Cousin (2006), Davies and Mangan (2007), and Hedges (2014), highlight the acceptance of both the list of threshold concepts, as well as the threshold concept approach to pedagogy in economics.

The contribution of this research is that it explores both the transformation of an economics curriculum, as well as the integration of threshold concepts into an economics curriculum. The curriculum is transformed via the re-sequencing of content using threshold concepts. Furthermore, the curriculum has threshold concepts integrated into every curriculum activity.

Addressing the 'why' of learning economics using the threshold concepts of economics

This research *transforms* a traditional economics curriculum that is built on the foundational concepts approach by re-sequencing this content according to the threshold concepts of economics.

This research aims to explore student learning outcomes as well as the student learning experience by transforming the way this curriculum is sequenced and delivered.

Through years of experience in teaching an entry-level microeconomics course, the researchers were able to identify where each of the threshold concepts of economics are best engaged in the pre-determined content of this course. With this knowledge, the researchers were then able to re-sequence the curriculum. The result was a curriculum whose teaching sequence and learning progression was guided by the learning outputs – the threshold concepts of economics, rather than a teaching sequence and learning progression that was guided by the building blocks – foundational concepts. The foundational concepts approach places the easiest ideas towards the beginning of the course, whereas the threshold concepts approach places the hardest ideas towards the beginning.

In our research, the content of this economics course was taken as a given. The researchers did not alter the quality or the quantity of the course's pre-determined content. Instead, the motivation of this research was to re-think the teaching sequence and the learning progression throughout the semester. This re-design of the teaching sequence was brought about by utilising the lens of threshold concepts itself to transform the course's curriculum.

Addressing the ‘*how*’ of learning economics using a *R.E.A.L.* framework to teach and learn economics

Once the threshold concepts are identified in lectures, they need to be strategically integrated into the course's tutorials. Here, our research is informed by Davies and Mangan (2008). These researchers developed three types of activities: ‘reflective exercises’, ‘problem-focused exercises’ and ‘threshold network exercises’. This research incorporates the exercises of Davies and Mangan (2008) into a revision of Bloom's Taxonomy (Anderson, Krathwohl, *et. al.*, 2001), to create a scaffolding for the teaching of economics in tutorials:

- ‘*Re-cap and Remind*’ – informed by the ‘reflective exercises’ of Davies and Mangan (2008), where students reflect, re-cap and remind themselves of the concepts and content covered in the prior week's lecture.
- ‘*Economics Everyday*’, where students can engage with and relate to these concepts by connecting these concepts to examples or scenarios that they experience every day;

- *‘Application and Awareness’* – informed by the aforementioned ‘problem-focused exercises’ of Davies and Mangan (2008). Here, the ‘economics everyday’ activity highlights how the concepts and the content can be utilised in an everyday real-world situation; and the ‘application and awareness’ activity asks students to solve a problem by utilising the concepts and content of the prior week’s lectures.
- *‘Learning Life Lessons’* – informed by the aforementioned ‘threshold network exercises’ of Davies and Mangan (2008). This is the last activity for the tutorial, where students are encouraged to critically evaluate a contemporary economic scenario by creatively utilising the concepts and content of the prior week’s lectures.

We represent this scaffolding of tutorials to engage the threshold concepts of economics as, *‘The R.E.A.L. framework’* for the learning and teaching of economics. Here, ‘R.E.A.L.’ stands for – Re-cap and remind; Economics every day; Application and awareness; Learning life lessons. This framework gradually and methodically equips the learner with the ‘*how*’ of learning economics, allowing a learning progression from base level learning to evaluative and critical thinking within the discipline of economics.

Literature Review

In the United Kingdom (UK), the threshold concepts of economics are being encouraged to be used as a guide when developing economics curricula (Shanahan, 2016). The UK’s tertiary education regulator, the Quality Assurance Authority (QAA) has created a Benchmark Statement for Economics (2007, 2015) which outlines the economics curriculum framework for higher education providers. This framework is based on four pillars:

- Subject knowledge and understanding.
- Subject specific skills.
- The transferable concept.
- Numeracy.

Within the third pillar: ‘the transferable concept’ is an explicit recognition of the threshold concepts of economics, which are transferable to other subject areas as they are transformative and integrative – the characteristics of threshold concepts: “From learning economic principles, the typical student acquires a facility with some key concepts that are present in most of the decision problems that they are likely to face subsequently in their careers,” (QAA, 2007, section 5.4). The

fourth pillar of the UK framework, on ‘numeracy’, incorporates core competencies in numeracy that are non-specific to the discipline of economics, but generic and transferrable across any context. What are deemed as the transferable concepts within the UK framework are the threshold concepts of economics which are listed in the ‘Embedding Threshold Concepts in First Year Undergraduate Economics’ (ETC project).

The ETC project was funded by the Higher Education Funding Council for England (HEFCE) and the Department for Employment and Learning (DEL) – in the UK, under the Fund for the Development of Teaching and Learning (Davies and Mangan, 2005). At the end of the project, there was agreement amongst the group about the importance of recognising the threshold concepts within economics with regards to the learning and teaching of the economics discipline (Davies and Mangan, 2005). The threshold concepts developed by the ETC Project as reported by Davies and Mangan (2005) are:

- Economic Models
- Opportunity Cost
- Marginal Analysis
- Equilibrium and Disequilibrium
- Markets – Interactions and Structures
- Elasticity
- Efficiency
- Comparative Advantage
- Real versus Nominal
- Cumulative Causation

The seminal works of threshold concepts in economics are Davies and Mangan (2003, 2005, 2006), who have researched and authored several papers on the topic. Davies and Mangan (2005) argue that once learners recognise the threshold concepts of economics, it would amount a transformation of the learners’ way of thinking within the discipline. Davies and Mangan (2005) also argued that the threshold concepts of economics are interconnected with each other to form a web, rather than a hierarchy of threshold concepts of economics. The synergy of multiple threshold concepts results in a further transformation of the learner.

As discussed in Karunaratne, Breyer and Wood (2016), there is some critique of the threshold concept approach in economics (O'Donnell, 2010; Tang and Robinson, 2010). However, published work in books such as Davies (2012), tertiary regulations such as QAA (2007, 2015), and journal articles such as Shanahan, Foster and Meyer (2006), Cousin (2006), Davies and Mangan (2007), Hedges (2014), Shanahan (2016), and Meyer (2016) highlight that there are improvements in both the student learning experience as well as student learning outcomes when using threshold concepts to inform curriculum design. These studies also confirm that there is general acceptance of the list of economics threshold concepts that was developed by the ETC Project.

Hedges and Pacheco (2015) discusses how the University of Auckland re-thought their economic curriculum around the threshold concepts of economics. The aim of the curriculum designers at the University of Auckland was to adopt a 'less-is-more' approach to cater to a diverse student cohort. The curriculum designers agreed that to innovate the curriculum, the pedagogy would need to be based on the threshold concepts of economics. However, unlike these researchers, our research does not alter the content that is taught in the curriculum. Rather, our research investigates whether attention to threshold concepts when designing a curriculum can improve the student learning outcomes and student learning experience for a given set of curriculum content.

Unlike Hedges and Pacheco (2015), the aim of our curriculum design was to integrate the threshold concepts of economics into an already existing curriculum. By using the literature on the application of threshold concepts in economics curricula, including the benchmark UK economic framework, the researchers aimed to integrate threshold concepts into the learning and teaching activities – to apply economics in the real world at the outset. This would then present the '*why*' of learning economics to engage students throughout the semester.

As the threshold concepts agreed upon by the ETC Project are discussed in the literature since (Cousin, 2006; Shanahan, Foster and Meyer, 2006; Hedges and Pacheco, 2015; Shanahan, 2016; Meyer, 2016), the researchers utilised this list of threshold concepts to transform the curriculum of this entry-level microeconomics course by integrating these threshold concepts. The objectives are to (1) enhance the student learning and experience, and (2) enhance the student learning outcomes of the course.

Context

An entry-level microeconomics course, at a large Australian university was transformed and investigated over three semesters of study by integrating threshold concepts, and by transforming the teaching sequence. In the Faculty of Business at this university, all undergraduate students are required to take this entry-level microeconomics course. These degrees include the: Bachelor of Actuarial Studies, Bachelor of Applied Finance, Bachelor of Business Analytics, Bachelor of Business Administration, Bachelor of Business Leadership, Bachelor of Economics, Bachelor of Commerce, and the Bachelor of Marketing and Media. Within a Bachelor of Commerce, students can choose from a range of majors: accounting, business information systems, decision science, economics, entrepreneurship, finance, human resources, international business and marketing. The different degree programs and the different majors attract students with different motivations for studying economics. These students also come from diverse academic backgrounds, due to the subjects studied in secondary education, as well as the differing entry criteria into each of these programs, (Karunaratne, Breyer and Wood, 2016)

Over the years, this entry-level economics course has grown from approximately 1,000 students in 2007, to 2,000 students in 2010, and 3,000 students in 2017. The highly theoretical and often abstract concepts in microeconomics are challenging for this large and diverse student cohort. Thus, we utilise a teaching philosophy to inspire, motivate and engage this cohort by emphasising the ‘*why*’, and by focusing on the ‘*how*’ of learning. To achieve these objectives, the curriculum has been re-designed by underpinning the curriculum around research including: threshold concepts by Meyer and Land (2003) and Davies (2012), learning taxonomies by Anderson, Krathwohl, *et. al.* (2001), and constructive alignment by Biggs (1996).

This research *integrates* into a single curriculum, the previous research on threshold concepts in economics curricula. We integrate threshold concepts into every aspect of the economics curriculum, including: lectures, tutorials, assessments, and feedback. This research does not change the content that is delivered in this microeconomics course. This is because this course is a service course for the Faculty of Business, as it is a core course for students of all majors. The content of each service course is decided at a program level, thus any changes to the content needs to be executed at the program level. This research takes the content as given and formulates a unique approach to delivery, emphasis and sequencing, by focusing on threshold concepts.

Methodology

The success of a curriculum can be judged by changes in student learning outcomes, as well as by investigating any changes in the student learning experience. Our research examines whether the transformation of the sequencing of content, as well as the explicit integration of threshold concepts into an economics curriculum improves student learning outcomes, as well as the student learning experience.

Student learning outcomes

Insofar that the curriculum is constructively aligned (Biggs, 1996), the transformation of the student is judged by the student's ability to see the world through the lens, the portal, and the way of thinking of an economist – achieving the learning outcomes of the course via the final course grade. When it comes to the assessment of student learning outcomes, this university awards grades based on the criteria outlined in Table 1:

Table 1 – Grade descriptors

Grade name	Letter grade	Standardised Numerical Grade range
High Distinction	HD	85 – 100
Distinction	D	75 – 84
Credit	Cr	65 – 74
Pass	P	50 – 64
Fail	F	0 – 49
Fail Absent	FA	
Fail Withdrawn	FW	

Student learning experience

In the aforementioned literature review, where each study incorporates threshold concepts into their pedagogy, student surveys are utilised to gauge the student experience. This approach of using student surveys is also used in the educational literature beyond threshold concepts such as:

Harvey and Fraser (2008), Bilgin, Primi, *et. al.* (2014), and McRae (2017). We evaluate the student learning experience by way of an end-of-semester student survey. This university's policy dictates that courses are surveyed at the end of the semester. The researchers included specific questions to gauge the student experience of the curriculum transformation. We used Likert scale ranking questions which we report in this chapter, as well as open-ended free response questions which we report on in Chapter 4 of this thesis. The questions were piloted in a summer semester offering of the course. As part of the continued research on this project, which is beyond the scope of this thesis, we have also surveyed the economics cohort from this group of students in their capstone course at the end of their program of study.

During the period of research which we will call: *Semester X*, *Semester Y*, and *Semester Z*, the curriculum was conducted in a transformed re-sequencing of topics, with threshold concepts integrated into the curriculum. For comparison purposes we use one semester before the study period, which we call *Semester N*. Excluding summer semesters, these four semesters are the entirety of the author's experience in co-ordinating this course, followed by a fifth semester, *Semester A*, which explores a further research question that is discussed in Chapter 4 of this thesis. In *Semester N*, threshold concepts were neither integrated into the curriculum, nor was the curriculum re-sequenced for threshold concepts. Across all *Semesters N*, *X*, *Y*, and *Z*, the content covered was identical, the course convenor (co-ordinator) was identical, the lecturers were identical, and the team of tutors was similar. The integrity of the curriculum's content, the teaching activities, and the assessment, was ensured by a rigorous moderation process which exists within the economics department, independent of this research. Nevertheless, each semester has a new cohort of students, so whilst we have controlled as much as possible, there will still be some variation in the cohorts.

The survey consisted of 22 questions, which consisted of both Likert Scale ranking questions as well as open-ended free response questions. Five of the Likert Scale ranking questions were relevant to evaluating the impact of the curriculum re-design. These questions (using the coding system of the survey) are displayed in Table 2. Students respond on a standard five-point Likert Scale with options ranging from ‘Strongly Agree’ (a score of 5) to ‘Strongly Disagree’ (a score of 1).

Table 2 – Survey Questions

Question code	Survey statement
CRU05	The unit content was organised in ways that assisted my learning.
CRU06	Teaching sessions (face-to-face and/or online) kept me engaged in the unit.
CRU07	The unit’s learning activities (e.g. assessments, in-class or online discussions and exercises) were effective in developing my understanding.
CRU11	This unit contributed to my development of one or more of the MQ Graduate capabilities.
CRU12	This unit challenged me intellectually.

Prior to the period of research study, the researchers trialled the transformed curriculum sequence discussed below in a smaller summer semester offering. The purpose of this pilot offering was the note both the unforeseen pedagogic implications as well as the unforeseen administrative implications of the re-sequencing of the curriculum.

This study investigates whether attention to the threshold concepts of economics can deliver an improvement in the student learning experience and the student learning outcomes of a microeconomics course. The scope of this microeconomics syllabus did not allow the researchers to address the threshold concepts of *real versus nominal* and the threshold concept of *cumulative causation*. This is because the syllabus content pertaining to these threshold concepts is covered in the complementary macroeconomics syllabus instead. This macroeconomics course is beyond the scope of this research project.

A curriculum transformation

This research *transforms* a traditional microeconomics curriculum that is built on the foundational concepts approach by re-sequencing this content according to the threshold concepts of economics. A vast literature exists on the importance of didaktiks, teaching sequences, and learning progressions, in the engagement of students and the achievement of student learning outcomes (Duncan and Hmelo-Silver, 2009; Duschl, Maeng and Sezen, 2011; Furtak, Morrison, and Kroog, 2014). Therefore, the investigation of the teaching sequence of topics in our introductory economics curriculum is relevant to curriculum redesign.

Through years of experience in teaching the course, the researchers were able to identify where the threshold concepts of economics are best engaged in the pre-determined content of this course. The researchers then used this knowledge to transform the weekly teaching sequence of this course. This ensured that the teaching sequence was guided by the learning outputs – threshold concepts of economics, rather than a teaching sequence that was guided by the building blocks – foundational concepts. The foundational concepts approach places the simplest ideas towards the beginning of the course, whereas the threshold concepts approach places the threshold ideas towards the beginning. The aim of this research was to use the lens of threshold concepts, to explicitly re-think the weekly teaching sequence of the semester.

The researchers worked through the pre-determined curriculum content of the course and re-structured the weekly teaching sequence as shown in Table 3.

Table 3 – Curriculum re-sequencing

Week	Traditional sequence of content	Transformed sequence of content
01	Introduction to Economics	Introduction to Economics and the PPF
02	PPF and Comparative Advantage	<u>Market Structures</u> – Producer Theory
03	Demand and Supply	<u>Market Structures</u> – Perfect Competition
04	<u>Elasticity</u>	Demand and Supply
05	<u>Efficiency</u>	<u>Market Structures</u> – Monopoly
06	<u>Government Actions in Markets</u>	<u>Market Structures</u> – Monopolistic Competition
	<i>Two-week mid-semester break</i>	<i>Two-week mid-semester break</i>
07	Externalities	<u>Elasticity</u>
08	Consumer Theory	<u>Efficiency</u>
09	<u>Market Structures</u> – Producer Theory	Externalities
10	<u>Market Structures</u> – Perfect Competition	<u>Government Actions in Markets</u>
11	<u>Market Structures</u> – Monopoly	Consumer Theory
12	<u>Market Structures</u> – Monopolistic Competition	Game Theory – Oligopoly
13	Game Theory – Oligopoly	Comparative Advantage

The main re-sequences in teaching are highlighted in Table 3. As is evident in this table, there was no alteration to the content or the coverage of the course. The researchers used the research and literature on threshold concepts, the existing content of the course, as well as the researchers' own experience to re-structure a new teaching sequence to deliver the intended learning outcomes of the course – the learning outputs, i.e. the threshold concepts of economics. In Chapter 2 of this thesis, I discuss the rationale behind the specifics of this curriculum re-sequencing, as well as the perceived and achieved advantages this curriculum re-sequencing. The discussion in Chapter 2, which is a published work, Karunaratne, Breyer and Wood (2016) is summarised below:

The main changes to the topic re-sequencing have been highlighted in Table 3. In the traditional topic sequencing, the foundational concepts of *elasticity*, *efficiency*, and *government actions in markets* were presented towards the beginning of the course. The students were then given a two-week break which involved a research-based assignment on these foundational concepts. After the two-week break, the more difficult concept of *market structures* was laid on top of these foundational concepts. The threshold concept of *market structures*, traditionally requires the foundational concepts of *elasticity*, *efficiency*, and *government actions in markets*, because the study of *market structures* involves the incorporation of these foundational concepts, to see how the different markets in the economy work.

In the transformed topic sequencing, the threshold concept of *market structures* is moved to the first half of the semester, engaging the students in this more difficult concept, but allowing the student to see how markets worked and interacted – a learning outcome of the course. During the two-week break, students were given a research-based assignment on this threshold concept of market structures and interactions. The assignment required students to find their own examples of the different market structures in the economy, and critically evaluate their findings based on the theory. This gave students the opportunity to see through the eyes of an economist, by seeing these markets at work in the contemporary world. Furthermore, the assignment gave students the opportunity to query the work that ‘happens behind the scenes’, that is, the foundational concepts of *elasticity*, *efficiency*, and *government actions in markets*. Once the semester re-convened, students were then introduced to the foundational concepts that were working behind the scenes of the threshold concept of *market structures*. We believe that this approach, of presenting the threshold concepts of economics at the outset, presents the learning outcomes of such a course as early as possible, and engages the student with seeing economics in their contemporary world, so that they are inspired to learn the course’s content, which includes the foundational concepts.

Results

The researchers transformed the curriculum of this entry-level microeconomics course by integrating threshold concepts, as well as transforming the sequencing of the content. The objective was to engage students in economics by highlighting the ‘*why*’ of learning economics and the ‘*how*’ of learning economics and thus:

- enhance the student learning and experience, and
- enhance the student learning outcomes of the course.

The student learning experience and the student learning outcomes are key measures by which we can evaluate the effectiveness of a transformed and re-designed curriculum.

The student learning experience

To evaluate the student experience of the curriculum, a student survey was conducted at the end of the semester. The number of valid surveys and the survey response rate are presented in Table 4. The semesters are presented in chronological order.

Table 4 – Survey response rates

	Semester X	Semester Y	Semester Z
Number of valid surveys	599	641	401
Response rate	39.8%	52.5%	27.2%

The university benchmark requires a response rate of 25% of the student cohort. Thus, *Semesters* X, Y, and Z, have high response rates, and based on this, the response rate allows us to draw useful conclusions later in this paper. The average of student survey responses, for each survey question, appears in Table 5.

Table 5 – Student average responses out of 5.0

Question code	Semester N	Semester X	Semester Y	Semester Z
CRU05	4.3	4.7	4.7	4.8
CRU06	4.1	4.5	4.5	4.6
CRU07	4.1	4.6	4.6	4.6
CRU11	4.0	4.3	4.4	4.4
CRU12	4.3	4.4	4.5	4.6

According to Table 5, the student feedback shows that the curriculum transformation via re-sequencing, as well as the integration of threshold concepts, delivered improvements in the student learning experience. Across all the five questions, and across all semesters of the research period, there were improvements in the student learning experience compared to *Semester N*. The responses across *Semesters X, Y, and Z* were very similar where all three semesters experienced the same curriculum transformation. There is evidence that ‘learning-by-doing’ by the teaching team, also contributes to some improvement in the student learning experience, as there is a slight increase in the student learning experience between *Semester X* to *Semester Z*. According to Table 4, there is evidence that the transformation of the curriculum does play a role in enhancing the student learning experience, when attention is paid to the threshold concepts of economics.

The student learning outcomes

Table 6 reports the results the final semester of the study, *Semester Z* against *Semester N*. As noted earlier, *Semesters X, Y and Z* involved a curriculum integrated with threshold concepts, as well as a curriculum re-sequencing around threshold concepts. However, *Semester N* involved a traditional curriculum built on foundational concepts. This university has guidelines which prevent these researchers from publishing the absolute number of students within each grade category. As a result, we report the percentage change in the proportion of each grade in *Semester Z*, relative to *Semester N*. The university has a policy of standards-based assessment and not norm-referenced assessment so that an improvement in the grade distribution demonstrates that more students achieved the required standard, and hence reflects an improvement in student learning outcomes.

Table 6 – Student Grade Distribution Change

Grade	Percentage Change over Semester N – Semester Z
HD	171.4%
D	33.3%
Cr	-11.5%
P	-33.3%
All Fails	-45.5%

As can be seen in Table 6, there is a marked difference in the grade distribution in *Semester Z* compared to *Semester N*, where the grades have improved. This demonstrates that there has been an improvement in the achievement of learning outcomes. There was a proportionate increase in the higher grades: High Distinction (HD) and Distinction (D). At the same time, there was a proportionate decrease in the lower grades: Pass (P) and Fail (F). ‘All Fails’ is a pooled category that combines: Fail (F), Fail Absent (FA) and Fail Withdrawn (FW). This pooled category exhibits a 45.5% reduction in the failure rate. The increase in the higher grades, and the decrease in the lower grades, indicates that overall, the curriculum re-design resulted in an improvement in the student learning outcomes.

Conclusion

One way to address the lack of interest in studying economics is by attending to the design of the economics curriculum. The curriculum design could be explicitly framed on the ‘*why*’ of learning economics, and the ‘*how*’ of learning economics. Students learn best when they are inspired to learn – the ‘*why*’ about their learning. Students also learn best when teachers equip students with the ‘*how*’ of learning. Embedding the ‘*why*’ and the ‘*how*’ into the curriculum can assist student learning journeys by enhancing their learning experience as well as their learning outcomes.

The researchers have applied and tested an alternative economic curriculum framework around threshold concepts – one that integrates threshold concepts into an existing economics curriculum and goes further by transforming the curriculum by transforming the sequencing of the content. It has been shown that the utilisation of threshold concepts in this curriculum framework does improve both the student learning experience as well as the student learning outcomes.

By working through and applying the literature on threshold concepts in economics, we recommend the transformation of the entire entry-level economic curriculum via the integration of threshold concepts, as well as the transformation of the teaching sequence and learning progression of the traditional economic curriculum. This research presents evidence that the teaching sequence of a course around the threshold concepts, rather than the foundational concepts, has the potential to engage students in economics, by highlighting the ‘*why*’ of learning economics explicitly via the threshold concept approach.

Ongoing research in this project, on the ‘*The R.E.A.L. framework*’ will also be useful to curriculum developers. Such a framework can also engage students in economics by highlighting the ‘*how*’ of learning economics explicitly via scaffolded activities based on learning taxonomies. This scaffolding mechanism in learning and teaching activities to integrate the threshold concepts of economics is a useful approach for both learners and teachers alike.

This research project is focused on entry-level economics. Thus, further research is needed on transforming the economics curriculum in intermediate economics courses, as well as capstone economics courses.

In the final chapter of this thesis, I discuss how these two innovations – the re-sequencing due to threshold concepts and the scaffolding of the *R.E.A.L. framework* work in a synergetic way to deliver improvements in learning outcomes and the learning experience. In the final chapter, I also investigate if the scaffolding has value, independent of the re-sequencing due to threshold concepts.

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Chapter 2: Transforming the economics curriculum

by integrating threshold concepts

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Statement of authorship:

As noted throughout this chapter, as the corresponding author, I was responsible for the conception, data collection, analysis and writing of this paper. I am grateful to my PhD supervisors, Dr. Yvonne A. Breyer and Prof. Leigh N. Wood, for their contribution in their role as my PhD supervisors.

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- “A relevant economics curriculum for a dynamic world” – *Annual Conference on Psychology, Education and Learning in Business and Information*, Macau, China (2015).
- “A relevant economics curriculum for a dynamic world” – *Annual Conference on Global Economics, Business and Finance*, Hong Kong, China (2015).

Chapter 2

2. Transforming the economics curriculum by integrating threshold concepts

Motivation: To engage students with the
'*why*' of learning and teaching
economics.

Key literature: Curriculum design
| Threshold concepts | Constructive
alignment

Innovation: Using the threshold concepts
of economics I created a unique
curriculum design and a unique topic
sequencing for economics
to engage students
in the '*why*' of
learning and teaching
economics.

Chapter 2: Transforming the economics curriculum

by integrating threshold concepts

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Abstract

Purpose – Economics is catering to a diverse student cohort. This cohort needs to be equipped with transformative concepts that students can integrate beyond university. When a curriculum is content-driven, threshold concepts are a useful tool in guiding curriculum re-design.

Approach – The evidence for this pedagogic need can be seen in the UK's higher education economics curriculum framework which is formulated around the threshold concepts of economics.

Methodology – Through a literature review of the application of threshold concepts in economics, the researchers have systematically re-designed an entry-level economics course. This research has been applied to the course structure, the learning and teaching activities, as well as the assessments.

Design – At the end of the semester, students were surveyed on the student experience of the curriculum design and the course activities. The course grades noted the achievement of the students' learning outcomes.

Findings – When comparing the survey responses and the student course results to the previous semesters, there is a significant improvement in student experience as well as student learning outcomes of the course curriculum.

Practical Implications – This research provides curriculum developers with a benchmark and the tools required to transform economics curricula.

Social Implications – An engaging, transformative and integrative entry-level economics course is often the only exposure most business graduates have to the economics way of thinking and practice.

Originality – This is the first comprehensive study that applies a curriculum re-design based on threshold concepts across an entry-level economics course.

Keywords: economics; higher education; learning and teaching; curriculum design; threshold concepts

The article on pages 108-125 has been suppressed for copyright reasons. The details of the suppressed article are as follows:

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Chapter 3: Making economics R.E.A.L. – a scaffolding for engaging, equipping and empowering students in economics

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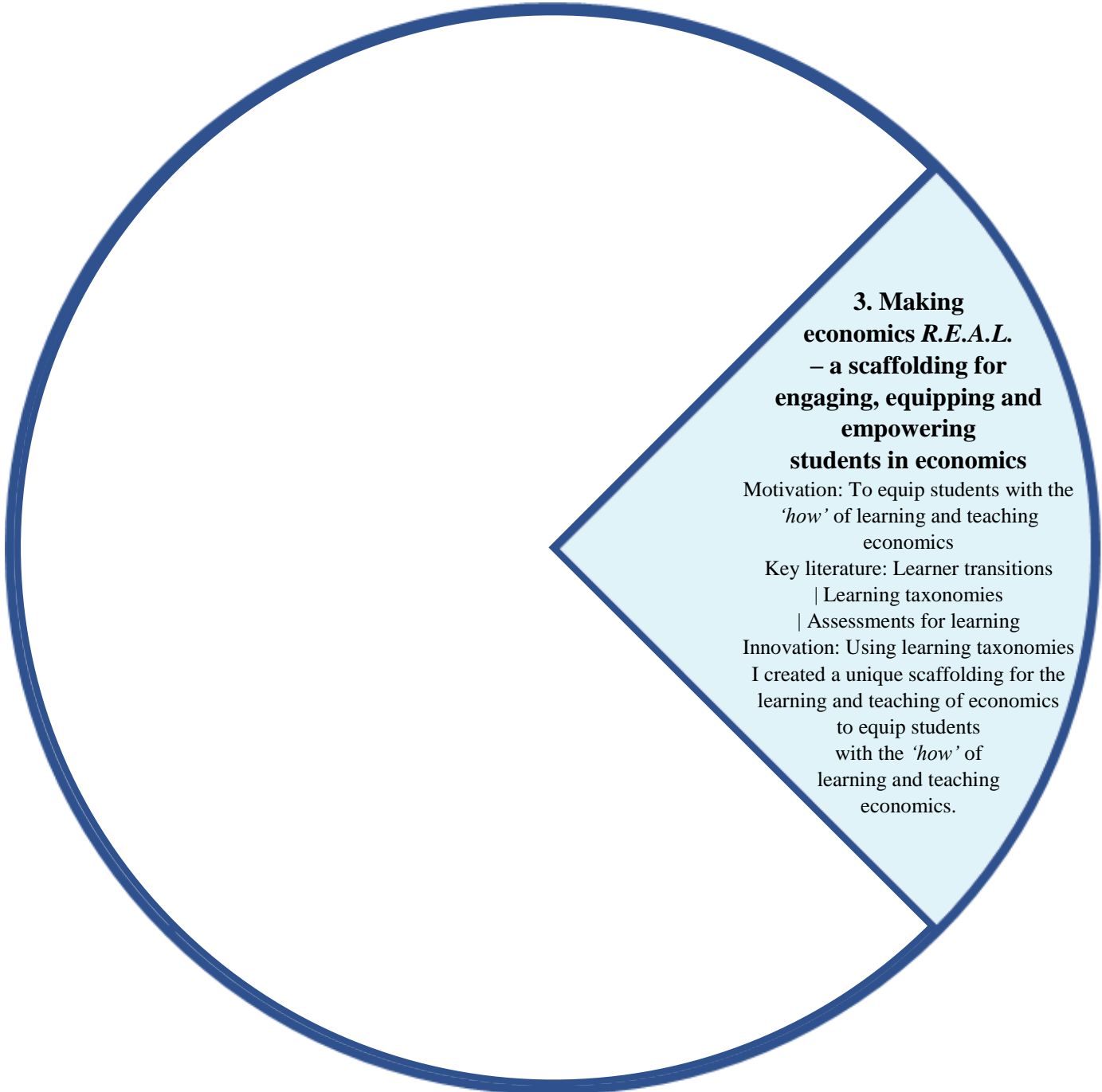
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- “A R.E.A.L. framework for the learning and teaching of economics” – *The Australasian Teaching Economics Conference*, Sydney, Australia (2017).
- “Making your teaching R.E.A.L.” – Learning and teaching workshop, Macquarie University, Australia (2017)

Chapter 3



3. Making economics *R.E.A.L.* – a scaffolding for engaging, equipping and empowering students in economics

Motivation: To equip students with the
'*how*' of learning and teaching
economics

Key literature: Learner transitions
| Learning taxonomies
| Assessments for learning

Innovation: Using learning taxonomies
I created a unique scaffolding for the
learning and teaching of economics
to equip students
with the '*how*' of
learning and teaching
economics.

Chapter 3: Making economics *R.E.A.L.* – a scaffolding for engaging, equipping and empowering students in economics

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Abstract

Learner transitions to university, such as the first course in economics, are critical to the transition from university to professional work or further study. The ‘*why*’ and the ‘*how*’ of learning and teaching economics is a critical transition opportunity. We re-design an economics curriculum around the threshold concepts of economics – engaging learners with the ‘*why*’ of learning economics; and we re-design the curriculum around learning taxonomies – equipping learners with the ‘*how*’ of learning economics. We develop an original *R.E.A.L. framework* – a four-step scaffolding to engage and equip learners with evaluative and critical thinking in economics. In this paper we present: a *R.E.A.L.* lecture, a *R.E.A.L.* tutorial, and a *R.E.A.L.* assignment. These activities will be useful for curriculum developers to create engaging economics lessons to promote interest in the discipline. Via student surveys, we evaluate the effectiveness of this approach where we find a significant improvement in the student learning experience.

Keywords: curriculum design; economics curricula; higher education; learner transitions; learning and teaching; learning taxonomies; threshold concepts

Chapter 3: Making economics *R.E.A.L.* – a scaffolding for engaging, equipping and empowering students in economics

Introduction

Students learn best when they are inspired to learn – the ‘*why*’ about their learning (Becker, 2000). Students also learn best when teachers acknowledge that learning itself is a journey that requires tools to navigate – equipping students with the ‘*how*’ of learning (Boud, 2000).

With first-year undergraduate economics students, imparting the ‘*why*’ about learning is challenging as these students may have a limited experience of the world beyond schooling. The ‘*how*’ to learn university economics is also key. The importance of assisting the transition to university is well documented in the literature (Kift, *et. al.*, 2010; Wood and Breyer, 2017). Embedding the ‘*why*’ and the ‘*how*’ into the curriculum would assist student transitions by enhancing their learning experience as well as their learning outcomes.

One way to integrate the ‘*why*’ and the ‘*how*’ of learning economics, is to build an economics curriculum that focuses on the threshold concepts of economics. Threshold concepts are the transformative concepts that learners can integrate into their careers and their daily lives (Meyer and Land, 2003) – the ‘*why*’ of learning economics.

To create a curriculum that engages the threshold concepts of economics, our research is informed by Davies and Mangan (2008). These researchers developed three types of activities: ‘reflective exercises’, ‘problem-focused exercises’ and ‘threshold-network exercises’. In our research, we incorporate the activity-types of Davies and Mangan (2008) into a revision of Bloom’s Taxonomy (Anderson, Krathwohl, *et. al.*, 2001), to create a scaffolding for the learning and teaching of economics – the ‘*how*’ of learning economics. The work of Davies and Mangan (2008) is a synthesis of the threshold concept approach with Bloom’s taxonomy when one looks at the nature

of the three types of exercises. ‘Reflective exercises’ address the lower-order thinking of Bloom’s taxonomy – *remember* and *understand*, while ‘problem-focused exercises’ address the middle-order thinking of Bloom’s taxonomy – *apply* and *analyse*. Finally, ‘threshold-network exercises’ address the higher-order thinking of Bloom’s taxonomy – *evaluate* and *create*. Thus, we found this work to be a useful benchmark to develop our framework. We term our framework: *R.E.A.L.*, which is an acronym for a four-step scaffolding that we elaborate on later in this paper.

In the next section, we discuss the rationale for choosing economics as a topic of interest due to its falling popularity in high schools and universities, and the impact that this can have on society. We then investigate the literature on learner transitions into higher education and learning taxonomies, to help inform our curriculum design. Following the investigation of the literature, we move on to discussing the innovations that we introduced into the curriculum of a large economics course to make the course engaging for learners by applying the research into threshold concepts – the ‘*why*’ of learning economics. We also innovate our curriculum by equipping learners with the tools to navigate their learning journey in economics by informing our innovations with the research into learning taxonomies – the ‘*how*’ of learning economics. We then present samples of a lecture, a tutorial and an assignment that have been framed around our four-step scaffolding: *R.E.A.L.* The paper concludes with a discussion of student surveys of their learning experience to help us analyse the significance of the impact of our curriculum design.

Why economics?

Everyone’s lives are affected by economic decisions, whether those decisions are made by oneself, or made by others (Dwyer, 2017). This is because economics is the study of how agents decide how to allocate their resources to satisfy their unlimited wants. To make choices, agents make trade-offs by evaluating benefits against costs. These choices then raise questions of the efficient use of resources as well as the fair allocation of resources and outcomes.

Since 2001, even though enrolments in economics at university are declining, enrolments in other subjects have risen, including the overall student population at universities (Dwyer, 2017). According to Dwyer, we are now experiencing a displacement of economic by other business-oriented subjects including: banking, finance, management and commerce.

As economics is relevant to everyone, as a society it is important to consider where economics is not studied more widely. According to Dwyer, interest and enrolments in economics at both high schools and universities has fallen rapidly over the past three decades. This not only has an impact on the discipline of economics, but also on the level of economic literacy that society possesses.

Transitions to higher education

In the higher education sector, students in their first year of study are keenly observed by researchers, administrators and practitioners (Kift, *et. al.*, 2010) as this is a key transition point. Thus, there is a large and growing body of research into the policies and the practices that are designed to target and improve the first-year experience (FYE) of students. This literature on the FYE discusses improving student success, retention and engagement. The literature notes the personal influences on the FYE such as student finances and student commitment to study (Yorke, 2006; Yorke and Longden, 2008). The literature also notes the institutional influences on the FYE such as the institutional structures, teaching staff and support staff – institutions and their teaching and support staff need to provide the necessary “conditions, opportunities and expectations” for such engagement to occur (Coates, *et. al.*, 2005, p. 26). Other papers that discuss the institutional obligations to the FYE are also presented in Bradley, Noonan, Nugent and Scales (2008), Gillard (2010) and Tinto (2009).

Wood and Breyer (2017) introduce a model that argues that the transition to university, such as the first course in economics, is critical to the transition from university to professional work or further study. This first transition into university study sets the scene and creates the conditions for students to be able to make the most of their university learning. The first course in economics introduces the key ideas and lenses through which to view the rest of their degree and professional work. Given that many students are the first in their family to gain access to university study (O’Shea, *et. al.*, 2017), this positioning of their learning at the start of their journey is critical.

The ‘*why*’ and the ‘*how*’ of learning and teaching economics is a critical transition opportunity. While attention to the threshold concepts of economics will help with emphasising the ‘*why*’ of learning economics, attention to learning taxonomies will help with developing the ‘*how*’ of learning economics

Learning taxonomies

Learning taxonomies are classifications of learning (Bloom, 1956). These classifications help describe the different forms and types of learning behaviours. They can be a useful framework for educators and curriculum designers to identify and differentiate between contrasting levels of learner cognition. Educators and curriculum designers can use these taxonomies to identify and differentiate cognition from lower-level learning to higher-level, navigating upwards from: remember, understand, apply, analyze, evaluate, and create (Anderson, Krathwohl, *et. al.*, 2001).

Learning can begin with the memorisation of a fact that is not even understood, to understanding that fact, to applying that fact to solve a problem, all the way to utilising that fact to evaluate a scenario to create new knowledge. Thus, learning taxonomies are useful in the development of curriculum material such as learning and teaching activities, as well as assessments.

Bloom's Taxonomy of Educational Objectives (Bloom, 1956) is the seminal learning taxonomy. According to Bloom, a learner needs to master each level before they can move up to the next. Anderson, Krathwohl, *et. al.* (2001) revised Bloom's Taxonomy, and this revision is presented in Figure 1. The revision was to update the taxonomy with the fifty years of innovations in the literature on learning and teaching since the original taxonomy.

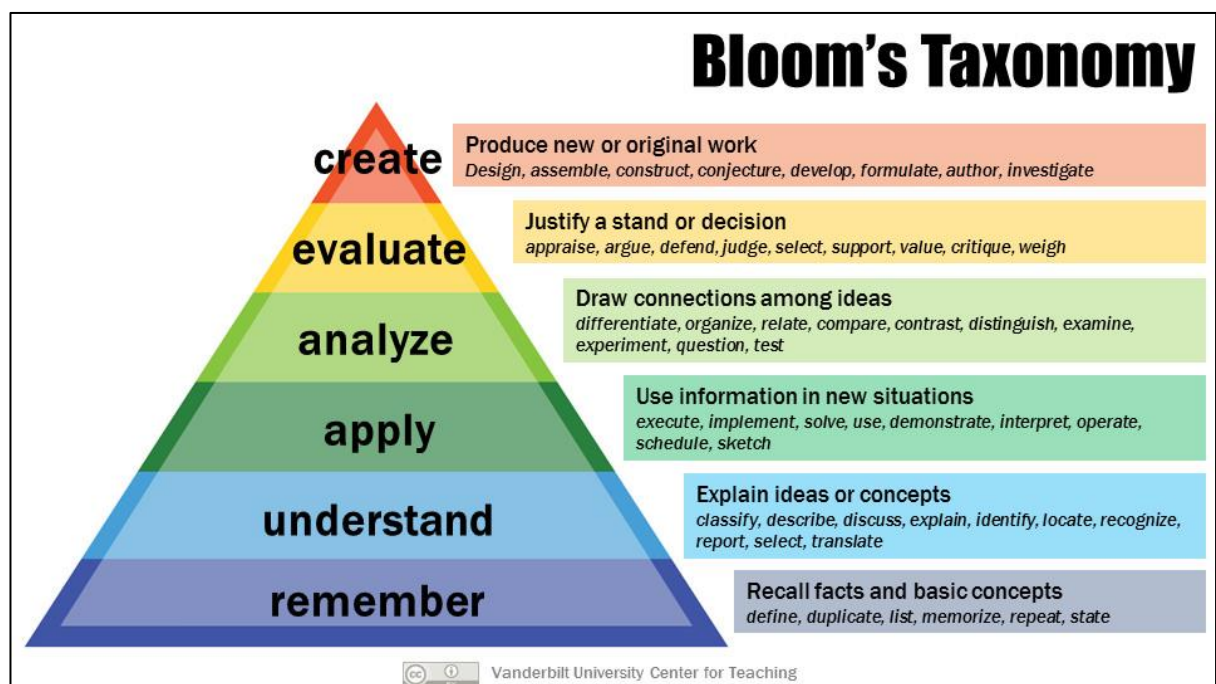


Figure 1: The revised Bloom's Taxonomy (Anderson, Krathwohl, *et. al.*, 2001).

Source: Centre for Teaching, Vanderbilt University, Nashville, Tennessee, U.S.A.

Other notable taxonomies in the literature include: the SOLO (structure of observed learning outcomes) Taxonomy (Biggs and Collis, 1989); the six facets of understanding (Wiggins and McTighe, 1998); and the taxonomy of significant learning (Fink, 2003).

The curriculum design

An entry-level core economics course is often the only exposure business graduates have to economics. Therefore, this course should be self-contained and make a transformative impact on these graduates, providing concepts and tools that they can integrate into any field of work or study. One way to make a transformative impact on these graduates is by re-formulating the course's curriculum around the threshold concepts of economics. Threshold concepts are the transformative concepts that learners will be able to integrate into their careers and their day-to-day lives (Meyer and Land, 2003). Applying a framework of threshold concepts can help us to design a curriculum that is engaging, transformative and integrative – to induct students into the economics way of thinking and practice.

In our research, an entry-level microeconomics course at a large Australian university was transformed and investigated over three semesters of study by integrating the 'why' and the 'how' of learning and teaching economics into the curriculum. All undergraduate students enrolled in the Faculty of Business at this university have *Microeconomic Principles* as a core course in their degree program. These programs encompass the bachelor's degrees of: Actuarial Studies, Applied Finance, Business Administration, Business Analytics, Business Leadership, Commerce, Economics, and Marketing and Media. From these degrees, the Bachelor of Commerce is the only degree where students can choose a major where these majors are: accounting, business information systems, decision science, economics, entrepreneurship, finance, human resources, international business and marketing. The different degree programs and different majors attract students with different motivations for studying economics. Due to the subjects studied in secondary education, as well as the differing entry criteria into these programs, the students come from a diverse range of academic backgrounds (Karunaratne, Breyer and Wood 2016).

Economics is a core course for all business programs, furthermore, the suite of degrees and majors offered by the Faculty of Business is constantly evolving. Over the years, this first year economics course has grown from approximately 1,000 students in 2007, to 2,000 students in 2010, and 3,000 students in 2017. The highly theoretical and often abstract concepts in microeconomics are

challenging for this large and diverse student cohort. Thus, we utilise a teaching philosophy to inspire, motivate and engage this cohort by emphasising the ‘*why*’, and by focusing on the ‘*how*’ of learning.

To achieve these objectives, the curriculum has been redesigned by underpinning the curriculum with research including: threshold concepts by Meyer and Land (2003) and learning taxonomies by Anderson, Krathwohl, *et. al.* (2001).

The ‘*why*’ of learning economics

One way to integrate the ‘*why*’ of learning economics is to build an economics curriculum that focuses on the threshold concepts of economics. Threshold concepts are the transformative and integrative concepts that are the lens of seeing the world through the eyes of each discipline (Meyer and Land, 2003).

The seminal works of threshold concepts in economics are by Davies and Mangan (2005, 2007, 2008), who have researched and authored several papers on the topic. They argue that once a learner recognises the threshold concepts of economics, it would amount to a transformation of the learner’s way of thinking within the discipline. Davies and Mangan also suggest that the threshold concepts of economics are interconnected with each other to form a web, rather than a hierarchy of threshold concepts of economics. The synergy of multiple threshold concepts results in a further transformation of the learner.

The threshold concepts developed by the Embedding Threshold Concepts (ETC) Project as reported by Davies and Mangan are:

- Economic Models
- Opportunity Cost
- Marginal Analysis
- Equilibrium and Disequilibrium
- Markets – Interactions and Structures
- Elasticity
- Efficiency
- Comparative Advantage

- Real versus Nominal
- Cumulative Causation

The ETC project was funded by the Higher Education Funding Council for England (HEFCE) and the Department for Employment and Learning (DEL) – in the UK, under the Fund for the Development of Teaching and Learning (Davies and Mangan, 2005).

Published work in books such as Davies (2012), tertiary regulations such as QAA (2007, 2015), and journal articles such as Shanahan, Foster and Meyer (2006), Cousin (2006), Davies and Mangan (2007), Hedges (2014), Shanahan (2016), and Meyer (2016) highlight that there are improvements in both the student learning experience as well as student learning outcomes when using threshold concepts to inform curriculum design. These studies also confirm that there is general acceptance of the list of economics threshold concepts that was developed by the ETC Project.

This paper is part of a larger research project on the learning and teaching of economics. In Karunaratne, Breyer and Wood (2016) we discuss the transformation of this course's economics curriculum by integrating these threshold concepts of economics – the '*why*' of learning economics. In this paper, we focus on utilising the literature on learning taxonomies to equip students with a scaffolding to higher level learning in economics – the '*how*' of learning economics.

The '*how*' of learning economics

While threshold concepts are useful in articulating the '*why*' of learning economics, students receive a transformative learning experience when we equip them with tools concerning the '*how*' of learning.

In this section of our paper, we discuss how we transformed the learning and teaching activities of our course's curriculum to navigate students from base-level learning to higher level learning. To ensure that the curriculum is designed to transform the learner, every learning and teaching activity is constructed around the revised Bloom's Taxonomy (Anderson, Krathwohl, *et. al.*, 2001).

Lectures, tutorials and the assignment are structured around the theme: *R.E.A.L.* Here, every activity in this course is broken into four parts, where each part gets progressively more challenging and involves higher-level thinking, progressively working through the revised Bloom's Taxonomy in Figure 1 around the acronym, *R.E.A.L.*:

'R' – *Re-cap and Remind*, where students are to recall the concepts covered that week (or the previous week) – *Remember* in the revised Bloom's taxonomy in Figure 1;

'E' – *Economics Everyday*, where students can engage with and relate to these concepts by connecting them to examples or scenarios they experience every day – *Understand* in Figure 1;

'A' – *Application and Awareness*, where students take their knowledge further by applying these concepts to a different, but a practical and contemporary scenario, thus providing an understanding of their learned expertise in a broader context – *Apply* and *Analyse* in Figure 1;

'L' – *Learning Life Lessons*, which is an evaluative exercise, encouraging informed critique, on a contemporary social issue, that builds on research-led, discipline-specific content – *Evaluate* and *Create* in Figure 1.

The *R.E.A.L. framework* systematically equips the learner to progress to the highest level of learning according to the revised Bloom's taxonomy – *Evaluate* and *Create*. This structure also fosters a program-based curriculum. When students attempt the challenging material in '*Learning Life Lessons*', they are equipped with the '*how*' of tackling higher-level courses in their degree programs. With this scaffolding, students are thus equipped with generic work and life skills to apply to their work, career and entrepreneurial endeavours – the transformative and integrative features of threshold concepts. Thus, students engage themselves in the subject as the learning and teaching activities explicitly highlight and work towards the '*why*' of their learning.

Addressing the ‘*how*’ of learning using a *R.E.A.L.* framework to teach and learn economics

In our course we integrated threshold concepts into every aspect of the economics curriculum, including: lectures, tutorials, and the assignment. The *R.E.A.L. framework* provided both learners and teachers a scaffolding to navigate from base-level knowledge of the threshold concepts, to higher level learning.

Lectures

Lectures are large group interactive teaching with around 500 students in one lecture hall generally of two hours’ duration. The threshold concepts were incorporated into lectures. Prior to each lecture, students are provided a set of lecture notes. The only modification of the lecture notes was that the threshold concept/s were highlighted at the beginning and when a threshold concept is explicitly being utilised in the articulation of an economic concept. The lectures are designed to cover most of the content of the curriculum. Lectures are interactive as they incorporate: polling software to engage students, time for students to solve problems together, as well as in-lecture experiments that demonstrate the threshold concepts in action (Emerson and English 2016).

Our curriculum design relies on the agreed-upon threshold concepts of economics in Davies and Mangan (2005). These threshold concepts were incorporated into lectures. The relevant threshold concepts are introduced at the beginning of lectures and the *R.E.A.L. framework* helps engage these threshold concepts and navigate through the lecture content.

Tutorials

Tutorials are small group learning with around 25-30 students facilitated by a tutor. The tutorials are designed to complement lectures via a group discussion to engage the threshold concepts of economics, where this discussion is moderated by a tutor.

While the lecture is the part of the learning and teaching activities of a curriculum where most of the content is introduced, the rest of the learning is delivered via a moderated group discussion to further engage the threshold concepts of economics – within tutorials. For example, *Economics models* is an agreed-upon threshold concept of economics (QAA, 2015; Davies and Mangan, 2005). Content that allows students to critique and question different economic models, as well as decide which models need to be applied to which real-world situation, is more engaging in a small group discussion (Davies and Mangan, 2005). Students can argue their case with peers, with the facilitation of this discussion by their tutors. Rather than the lecturer critiquing the model for the student, and the lecturer directing how each model fits a specific real-world application– students are presented with examples and case-studies in tutorials (O'Donnell, 2010). They can then engage with the threshold concepts in small groups, by discussing why (or why not) each model fits a particular scenario and critically review the model's assumptions for that case. This pedagogical approach is appropriate for engaging a diverse student cohort (Meyer and Land, 2006).

Therefore, once the threshold concepts are identified in lectures, they need to be strategically integrated into the course's tutorials. Here, our research is informed by Davies and Mangan (2008), who developed three types of activities: 'reflective exercises', 'problem-focused exercises' and 'threshold network exercises'. We scaffolded their approach within tutorials in four steps, informed by a revision of Bloom's Taxonomy (Anderson, Krathwohl, *et. al.*, 2001):

- '*R*' – '*Re-cap and Remind*' – informed by the 'reflective exercises' of Davies and Mangan (2008), where students reflect, re-cap and remind themselves of the concepts and content covered in the prior week's lecture.
- '*E*' – '*Economics Everyday*', where students can engage with and relate to these concepts by connecting these concepts to examples or scenarios that they experience every day;
- '*A*' – '*Application and Awareness*' – informed by the aforementioned 'problem-focused exercises' of Davies and Mangan. Here, the 'economics everyday' activity highlights how the concepts and the content can be utilised in an everyday real-world situation; and the 'application and awareness' activity asks students to solve a problem by utilising the concepts and content of the prior week's lectures.
- '*L*' – '*Learning Life Lessons*' – informed by the aforementioned 'threshold network exercises' of Davies and Mangan. This is the last activity for the tutorial, where students are encouraged to critically evaluate a contemporary economic scenario by creatively utilising the concepts and content of the prior week's lectures.

We have represented this four-step scaffolding to engage the threshold concepts of economics as, the *R.E.A.L. framework* for the learning and teaching of economics. In our curriculum design, students are explicitly made aware of the *R.E.A.L. framework* via the structure of each week's tutorial

The assignment

The *R.E.A.L. framework* is again explicitly used to scaffold the student's within-semester take-home assignment. According to the research of Boud (2000), assessments are *for* learning as opposed to solely being assessments *of* learning. Rowntree (1987) notes that the assessment programme needs to be a key teaching tool instead of acting primarily as a measurement tool. Similarly, Gibbs (1999) notes that the goal of assessments is to use the tasks to encourage engagement and integrative learning.

The assignment is designed in such a way to allow learners to connect the various economic concepts and models, and to assess deeper understanding. The language used in the assignment is informed by the research of Dyer (2013) with effective strategies in the framing of assessment questions without comprising on their rigour or quality. Personal reflection and application of knowledge in the take-home assignment allows the student to view the presented problems with the required lenses and gateways of thinking and practice (Meyer and Land, 2003).

Weekly quizzes

Weekly quizzes were utilised to re-cap and remind students about the course's weekly content, building upon the first tier of the *R.E.A.L. framework* – 're-cap and remind'. Our research is informed by the work of Shanahan, Foster and Meyer (2010) where students were given weekly multiple-choice quizzes to examine the acquisition of the basic content of the prior week's tutorial.

The final examination

The largest component of judgment of a student's achievement of a course's learning outcomes is via a final examination. Threshold concepts are integrated into the final exam, by presenting 60% of the final examination paper as unseen questions based on a seen case study. Here students must utilise the lens of the threshold concepts themselves prior to the examination and view the world as an economist; that is, students are encouraged to foresee the questions that economists would

tend to ask when viewing with these lenses of threshold concepts. Thus, this draws upon the evaluative ‘threshold network exercises’ of Davies and Mangan (2008).

Making economics *R.E.A.L.*

The next three sections present a *R.E.A.L.* lecture, a *R.E.A.L.* tutorial, and a *R.E.A.L.* assignment. All these learning and teaching activities were utilised in the delivery of this microeconomics course during the timeframe of our study.

The *R.E.A.L.* lecture that is presented is the traditional microeconomics topic of *Producer Theory*. This is the topic where students are introduced to the various production and cost functions of a firm. The topic is generally considered to be cognitively challenging as the coverage involves prose, mathematics, as well as graphs. By focusing on the threshold concepts of *Marginal Analysis* and *Economics Models*, and utilising the *R.E.A.L. framework*, our curriculum design aimed to make the lecture a transformative experience for the learner.

The *R.E.A.L.* tutorial that is presented is about specialisation and the associated gains from trade. The threshold concepts of economics that are engaged in this tutorial are: *Marginal Analysis* and *Economic Models* as well as *Comparative Advantage*. By underpinning the tutorial on these threshold concepts and gradually navigating the learner from base-level learning to higher-level learning in Bloom’s taxonomy using the *R.E.A.L. framework*, our curriculum design aimed to create an engaging tutorial where students are equipped to take part in contemporary discussions about protection versus free trade.

The *R.E.A.L.* assignment that is presented was aimed to assess student understanding at all levels of Bloom’s taxonomy. Through purposefully structuring the assignment around the *R.E.A.L. framework*, learners are encouraged to be engaged with economics in their everyday lives. The assignment is designed as a tool *for* learning, rather than a tool that is solely *of* learning. After completing the assignment, students should be able to see through the portal and gateway of thinking that is discussed in Meyer and Land (2003) – seeing the world through the eyes of an economist – specifically, seeing the markets that students interact with in their everyday lives, through the eyes of an economist.

A R.E.A.L. lecture – Producer choices and constraints

This lecture, as all lectures, is presented as two 50-minute blocks within a two-hour lecture. This allows for ten minute breaks within each hour. Lectures are presented in a traditional lecture theatre, in a theatre with 500 seats. While students are somewhat fixed into their tiered seats, there is space for interactivity on the theatre floor. With the assistance of the university's facilities department, five desks, five chairs, as well as standard stationery items can help create an interactive lesson by incorporating volunteers from the audience.

The first fifty-minute block within the first hour of a two-hour lecture:

Re-cap and Remind

Introduce the foundational concepts (*Bloom's Taxonomy Level 1 – Remember*) – introduce the key terms that are specific to this lesson (5 minutes).

Re-cap and remind the threshold concepts (*Bloom's Taxonomy Level 1 – Remember*) – review the context of the topic in the broader context of firms wanting to maximise profit. In other words, review the context of the topic in terms of the threshold concepts of economics, introduced in Week 1. The threshold concepts engaged in this topic are – *Marginal Analysis* and *Economic Models* (5 minutes).

Key concepts

- Firms aim to maximise profits. $\text{Profit} = \text{Revenues} - \text{Costs}$.
- Costs are the payments to the resources that firms hire (land, labour, capital and entrepreneurship).
- Some costs are fixed – do not depend on how much you produce (like leasing a factory)
- Some costs are variable – they do depend on how much you produce (like purchasing raw materials).

Economics Everyday

An engaging every day example (*Bloom's Taxonomy Level 2 – Understand*) – Get students to conceptualise the above concepts via reference to the university as an example (the buildings are a fixed cost, but teachers are a variable cost) – As we enrol more students, from 0 to 40,000, the number of buildings is fixed; however, we need more teachers (5 minutes).

Excursion (*Bloom's Taxonomy Level 2 – Understand*) – Invite students to a virtual excursion to the factory production line in the image below (Figure 2). Now get the students to relate the key concepts from the previous activity the picture of this production line (5 minutes).



Figure 2: Huajian shoe factory in the Eastern Industrial Zone in Ethiopia

Source: Flickr, UNIDO, 2015.

<https://www.flickr.com/photos/unido/19095762104>

Application and Awareness

Experiment (*Bloom's Taxonomy Level 3 – Apply*) – We will create a mock production line in the classroom and create a mock product in this activity as per this video: <https://www.youtube.com/watch?v=6wlfx-spPe0>. (15 minutes)

What are we producing – Shoes: fold a piece of paper three times, followed by drawing the logo of the shoe.

Where are we producing – We set up a factory production line in the classroom to run the activity: Set up a row of 4 desks and 4 chairs to emulate the factory line, the students emulate workers, and paper and pens emulate raw materials. Describe the set up to the students while connecting them to the image of an actual factory on the screen.

How are we producing – Assign one student as the timekeeper and assign another student as the “worker”. They get 45 seconds to make as many shoes as possible. We then count the number of shoes produced. Now, invite a second student to the factory floor and ask the class for ideas about

how the two students should work together – now repeat the task. Add students to the production line (up to 5 - 7) progressively and note the number of shoes.

Learning Life Lessons

Life lesson #1 (*Bloom's Taxonomy Level 4 – Analyse*) – The point of the task is to analyse the scenario and teach the students about specialisation, and the increasing returns that come along with specialisation.

Students are progressively added to the production line, and the entire class provides expertise as to how the tasks should be completed.

While this happens, data is constantly entered into an accompanying Excel file that tabulates the results and generates a scatter plot. (7 minutes).

Life lesson #2 (*Bloom's Taxonomy Level 4 – Analyse*) – Eventually, the students get to visualise and analyse that the increasing returns from specialisation begin to diminish, and that eventually that there are diminishing returns on the fixed factory floor. Use the data from the experiment to explain the law of diminishing marginal returns to students (7 minutes).

The second fifty-minute block within the second hour of a two-hour lecture

Discussion (*Bloom's Taxonomy Level 5 – Evaluate*) the law of diminishing returns and ask students to discuss in pairs or groups how a company might be able to work around this law. Invite students to share and highlight the key points to students (10 minutes).

Theory linked to experiment / activity – Go through the accompanying lecture slides to teach the various product and cost curves, and at every new curve, bring back students to connect with these via the experiment that was conducted in class. (25 minutes).

Create an artefact (*Bloom's Taxonomy Level 6 – Create*) – Discuss the case study of a major department store in suburb of Sydney having to exit a large shopping centre that it is based in. Use this case to highlight the importance of understanding the various types of costs of production that were discussed in this lesson. Ask students to create clauses for new contracts for both the shopping centre as well as Myer so that both parties can create scenarios for increased flexibility. (10 minutes).

Summarise the key lesson points (5 minutes).

A R.E.A.L. tutorial – Specialisation and gains from trade

The threshold concepts of economics that are engaged in this tutorial are: *Comparative Advantage*; *Economic Models*; and *Marginal Analysis*. This tutorial is presented in the original formatting provided to students with **key concepts and ideas in bold**, **threshold concepts in bold and underlined**, and the tutorial solutions which are also the *tutor notes in italics*.

Re-cap and Remind

This topic engages the **economics threshold concept of economic models** where our models are usually 2D graphs. Differentiate between a graph that shows a value that is **increasing at an increasing rate** from a graph that shows a value that is **increasing at a decreasing rate**. As we move away from the origin, what is happening to the slope of the graph in each of these two scenarios?

See the solutions incorporated below.

Economics Everyday

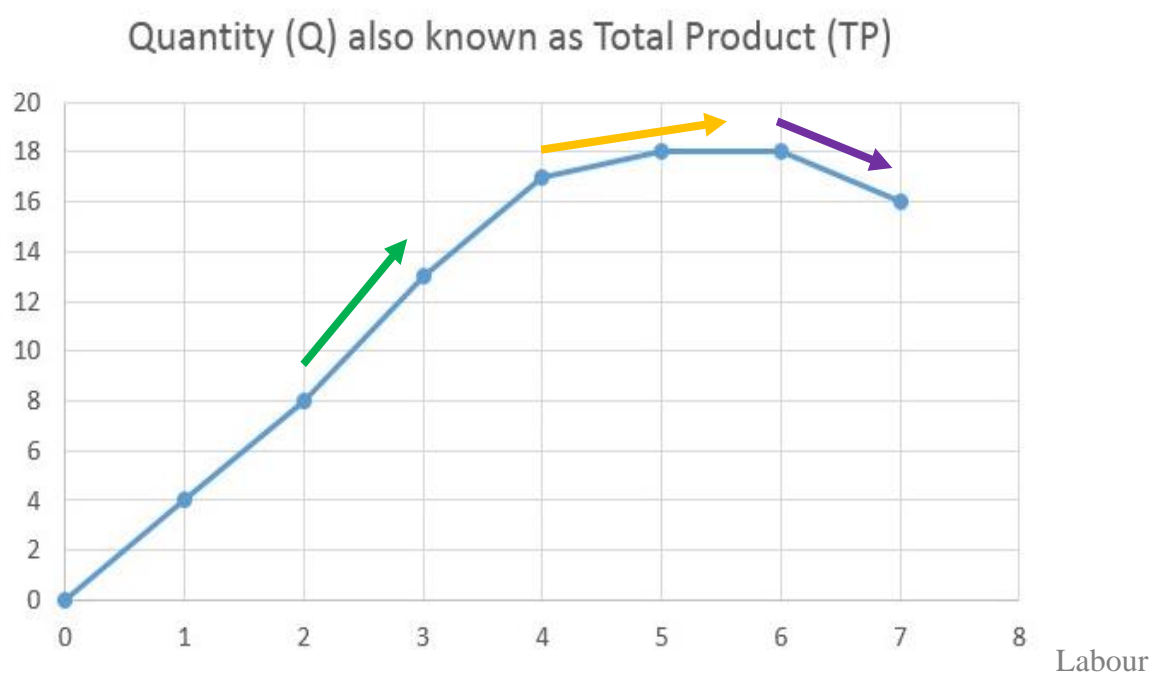
This topic engages the **economics threshold concept of marginal analysis**.

Watch the following video of a factory production line: <https://youtu.be/6wlfx-spPe0>

Complete the following table based on what you observe in the video:

Labour (L)	Total Product (TP)	Marginal Product (MP)
0	0	
1	4	4
2	8	4
3	13	5
4	17	4
5	18	1
6	18	0
7	16	-2

- Draw a large, labelled and accurate graph of the total product (TP) for the table above, with labour (L) on the x-axis and output (Q) on the y-axis.
- Draw a large, labelled and accurate graph of the marginal product (MP) for the table above, with labour (L) on the x-axis and marginal product (MP) on the y-axis.
- Explain the connection between **Total Product (TP)** and **Marginal Product (MP)**.
- Describe what is happening to the output for each section of the production function. Explain what is happening at each section.



$MP = \Delta Q / \Delta L = \text{slope of TP since:}$

$\text{Slope} = \text{rise} / \text{run} = \text{vertical } \Delta / \text{horizontal } \Delta = \Delta Q / \Delta L$

Section I – TP is increasing at an increasing rate. The slope = MP is increasing.

Section II – TP is increasing at a decreasing rate. The slope = MP is decreasing.

Section III – TP is decreasing. The slope = MP is negative.

Application and Awareness

Assume that there are two companies: Nike and IBM. These two firms can only produce two goods: shoes (S) or computers (C). Using all their resources, Nike is able to produce the number of shoes indicated by the output of the 5 workers in the video, or Nike can use all their resources

to produce 3 units of computers. Using all their resources, IBM is able to produce the same number of shoes as Nike, or IBM can use all their resources to produce 9 units of computers.

- a) Draw graphs of each company's linear PPF with shoes (S) on the horizontal axis and computers (C) on the vertical axis.
- b) Using this example, differentiate between **absolute advantage** and the **threshold concept of comparative advantage**.
- c) Based on your answer, who should specialize in the production of shoes and who should specialize in the production of computers? Explain why.
- d) Now assume that the two companies trade. What would be an agreeable rate of exchange, known as the **terms of trade**? Explain why.
- e) Use your terms of trade to draw the PPF after trade known as the **Consumption Possibilities Frontier (CPF)** and thus show the **gains from trade**.

For these tutorial solutions, see Chapter Appendix A.

Learning Life Lessons

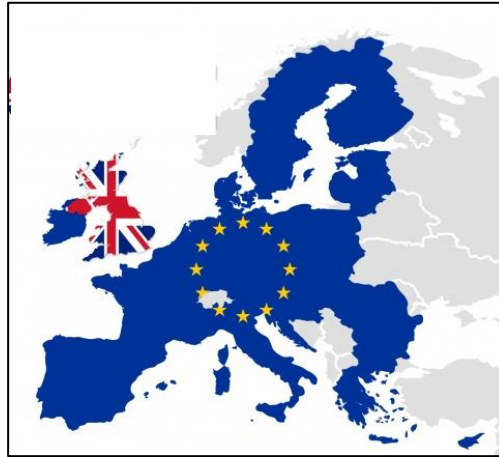


Figure 3: The European Union

Source: *Public Domain Pictures*

<https://www.publicdomainpictures.net/en/view-image.php?image=165944&picture=brexit>

You may have been following the news in June 2016 about The United Kingdom voting to leave the European Union. The European Union is a political and economic union of 28-member European states. This debate and the eventual decision by The United Kingdom to leave the EU has been termed by the popular media as “Brexit”. If you are unfamiliar with this piece of current affairs about “Brexit”, please see the appendix to this set of questions.

- a) Utilise your knowledge of comparative advantage and trade as well as your answer to the Application and Awareness question to explain one of the economic rationales behind the formation of the European Union. Likewise, what economic rationale is there for Australia to sign **Free Trade Agreements** with South Korea, Japan and China in recent years?
- b) What conditions must be met for such gains from trade to be as extensive as the model implies?
- c) Using your answer to (a) and (b) explain why it could be envisaged that there are voters who would vote in favour of The United Kingdom leaving the European Union.

This question is deliberately placed to encourage class discussion based around a contemporary issue which has featured heavily on the news / media – to show that what teach is directly applicable to the real world and that there are ways to question what economic models do tell us. The motivation is not to convince students which argument is correct – but to present both sides of the argument and let them critically evaluate. There are more answers than the ones outlined below, these would have been discussed in class.

For these tutorial solutions, see Chapter Appendix B.

A R.E.A.L. assignment – Market structures

The assignment is also designed around the *R.E.A.L. framework*. The purpose of this assignment is to allow the learner to see the world through the eyes of an economist, by navigating the learner through activities that revolve around the threshold concept of *Market Structures*. A sample assignment is presented in Chapter Appendix C. We provide the rationale for the structure of this sample assignment below:

Re-cap and Remind

The purpose of this question is to re-cap and remind students of the basic production and cost functions. Thus, this question mainly assesses base-level understanding, at the first level of Bloom's taxonomy – *Remember*.

Economics Everyday

The purpose of this question is to assess student understanding of a market structure, such as perfect competition, by relating to an everyday product that students engage with – wheat. Thus, this question assesses the second level of Bloom's taxonomy – *Understand*.

Application and Awareness

This question now takes student understanding of market structures to a higher level, requiring students to be aware that economics concepts can be applied to analyse a contemporary economics case study. Thus, taking students to higher level learning in Bloom's taxonomy – *Apply* and *Analyse*.

Learning Life Lessons

This question assesses the highest levels of Bloom's taxonomy – *Evaluate* and *Create* – in order to learn a life lesson. The context is the changing casino market in Sydney, where there has been discussion in the media about the pros and cons of amending the incumbent casino's exclusive license (The Star casino), to allow a newer entrant into the market (The Crown casino). Students will need to evaluate this using the economics concepts that they have learnt. Furthermore, students are invited to create new knowledge by requiring them to research the market and synthesise ideas to create new scholarly knowledge.

Results

We name the three semesters of research, in chronological order: *Semester X*, *Semester Y*, and *Semester Z*. These semesters underwent the transformed curriculum via the scaffolding of the learning and teaching activities according to our *R.E.A.L. framework*. For comparison purposes we use one semester before the study period, which we call *Semester N*. In *Semester N*, the curriculum was the standard undergraduate microeconomics curriculum without the *R.E.A.L.* scaffolding. Across all *Semesters N, X, Y* and *Z*, we controlled for other variables such as: the coverage of the content, the course convenor (co-ordinator), as well as members of the teaching team. The moderation process in the Faculty of Business, that exists independent of our research ensures the integrity of the content, the learning and teaching activities, as well as the assessment tasks. Despite what we have controlled for, each semester will always experience some variation in the student cohort.

Our research motivation is to gauge whether attention to the ‘*why*’ and the ‘*how*’ of learning and teaching economics can have a positive impact on the student learning experience. A survey was conducted at the end of each semester to gauge the student learning experience of the re-designed curriculum. While the survey is part of the university policy, we included specific questions to gauge the student experience of the curriculum re-design (Table 4). During the period of research, survey response rates were consistently high. For example, of the 1,220 students enrolled in *Semester Y*, 641 students took part in the survey, giving a response rate of 52.5%. Furthermore, the response rate fulfils the university and national benchmark of a requirement that 25% of the student cohort needs to provide feedback for a valid result. As the survey response rate is high, and our sample size is large, this enables us to draw robust conclusions.

The survey consisted of 22 questions, where 5 of these questions are relevant to evaluating the effectiveness of the *R.E.A.L. framework*. The framework was only made explicit to students during tutorials, as well as the structure of the assignment, while the framework was only implicit in the presentation of lectures. Thus, we include specific questions about the student experience of tutorials – about re-capping the lecture content (TUU04) as well as assisting their understanding of the overall subject (TUU01). These questions (using the coding system of the survey) are displayed in Table 4.

Table 4: Survey Questions

Question Code	Survey statement
CMU01	The resources provided with the unit (including online, written, etc) assisted my learning.
TUU04	The tutorials for this unit helped me understand the lecture material.
TUU01	The tutorials for this unit assisted my understanding of the subject.
ENU03	I enjoyed attending classes for this unit.
GLU02	Overall, this unit provided me with a valuable learning experience.

For each survey statement, students were required to give a response on a five-point Likert scale, with responses ranging from ‘Strongly Agree’ to ‘Strongly Disagree’. The average survey responses appear in Table 5. The relative frequency responses for a sample semester, *Semester Z*, appear in Table 6.

Table 5: Student Average Responses out of 5.0

Question	Semester N	Semester X	Semester Y	Semester Z	t statistic	p-value
CMU01	4.2	4.6	4.6	4.6	11.876	0.000
TUU04	4.0	4.1	4.2	4.4	2.841	0.005
TUU01	4.0	4.1	4.2	4.4	2.986	0.003
ENU03	4.0	4.4	4.4	4.3	6.636	0.000
GLU02	4.1	4.5	4.5	4.4	8.240	0.000

Table 6: Relative frequency of responses, Semester Z

Question	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
CMU01	66.7%	27.4%	4.8%	1.2%	0.0%
TUU04	54.3%	33.3%	7.4%	3.7%	1.2%
TUU01	63.0%	24.7%	7.4%	3.7%	1.2%
ENU03	55.3%	27.1%	11.8%	3.5%	2.4%
GLU02	54.2%	33.7%	8.4%	2.4%	1.2%

In Table 5, the results for *Semester X*, *Y* and *Z* are near-identical for three of the survey questions, and *Semester Y*'s responses are somewhat the average of *Semester X* and *Z* for two of the survey questions. Thus, we choose *Semester Y* to conduct our statistical tests, where the t-statistics and p-values provided are for two-sample t-tests of *Semester Y* versus *Semester N*.

The student feedback presented in Table 5 indicates that the *R.E.A.L. framework*, did significantly improve the student learning experience – all the t-statistics are significantly large, and all the p-values are near-zero. Across all these five questions, there were improvements in the student responses compared to *Semester N*. According to Table 5, the resources provided to students based on the *R.E.A.L. framework* assisted their learning (CMU01). Furthermore, tutorials helped students to re-cap and understand lectures (TUU04), and tutorials assisted students' understanding of the subject (TUU01). Students “enjoyed attending classes for this unit” (ENU03) indicating that they were engaged in the economics curriculum, and students felt that the course provided them with a valuable learning experience (GLU02).

The effectiveness of the *R.E.A.L.* approach could be specific to the context of an entry-level economics course. As discussed, the course is a core course that is attempted by students who mostly wish to major in another business discipline. Student pre-conceptions about economics being a theoretical subject, an abstract subject or an irrelevant subject may result in a heightened appreciation of any attempt to make the subject matter more ‘real’. As the literature review in this thesis establishes that this an experience for most entry-level economics courses in business

faculties across the world, while the result could be context specific, the context is a recurring and relevant one for business faculties.

The author of this research has been able to successfully apply the *R.E.A.L.* approach in a different context, in a different discipline, which is discussed in the concluding chapter of this thesis. The *R.E.A.L.* approach has been utilized to create a massive open online course (MOOC) to teach Microsoft Excel to a global cohort of more than 50,000 learners. Furthermore, the concluding chapter of this thesis outlines avenues where the author has presented this research in practical workshops for teachers beyond the field of economics.

Conclusion

Relative to other business-related disciplines, fewer students are studying economics. However, economics covers the key ideas needed for a career in business and therefore it is important to stimulate students to engage with these ideas. We have shown that students learn best when they are inspired to learn – the ‘*why*’ about their learning, and when they are equipped to learn – the ‘*how*’ about their learning.

We have shown that curriculum designers can create an engaging curriculum using the threshold concepts of economics that transform learners with concepts that they can integrate into their daily lives. Equipping students with threshold concepts will explicitly frame the curriculum around the ‘*why*’ of learning economics.

We have used the *R.E.A.L. framework* to assist teachers to develop the ‘*how*’ of learning. Such a framework engages students in economics by highlighting the ‘*how*’ of learning economics explicitly via scaffolded activities based on learning taxonomies. This scaffolding mechanism is a useful approach for both learners and teachers alike. Furthermore, learners are equipped and empowered with the ability to engage economic concepts with contemporary scenarios and current affairs at a higher level of learning – utilising evaluative and creative thinking.

Explicitly discussing contemporary scenarios and current affairs engages learners in the economics curriculum which has positive impacts on their interest in the discipline. Embedding the ‘*why*’ and

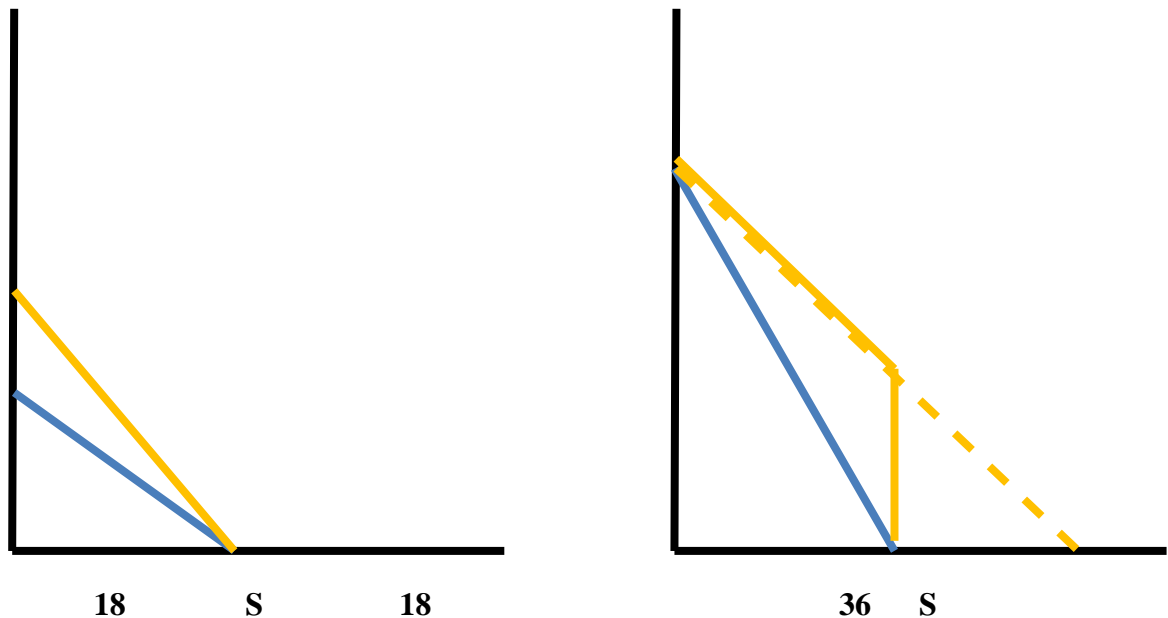
the ‘*how*’ into the curriculum can assist student learning journeys by enhancing their learning experience as well as their learning outcomes.

It is possible that *R.E.A.L.* learning and teaching activities that presented in this chapter such as the lecture, the tutorial, and the assignment, can all be created independent of a curriculum that has an eye for threshold concepts. In the final chapter of this thesis, I discuss how these two innovations – the re-sequencing due to threshold concepts and the scaffolding of the *R.E.A.L. framework* work in a synergetic way to deliver improvements in learning outcomes and the learning experience. In the final chapter, I also investigate if the scaffolding has value, independent of the re-sequencing due to threshold concepts.

Future research will focus on the improvements this transformed curriculum has on both the student learning experience, as well as the student learning outcomes and there are opportunities to use the *R.E.A.L. framework* with intermediate economics courses, as well as capstone economics courses.

Chapter Appendix A

These are the tutorial solutions to the sample *R.E.A.L.* tutorial – the *Application and Awareness* section:



BLUE = PPF

ORANGE = Trade Line (dashed) and CPF (thick)

Absolute Advantage: the ability to produce more than another.

IBM has an absolute advantage in the production of computers (C). Neither firm has an absolute advantage in the production of shoes (S).

Comparative Advantage: the ability to produce at a lower opportunity cost.

Computers

NIKE

$$3C = 18S \rightarrow 1C = 6S$$

IBM

$$9C = 18S \rightarrow 1C = 2S$$

Therefore, IBM has a comparative advantage in the production of computers

Shoes

NIKE

$$18S = 3C \rightarrow 1S = 1/6 C$$

IBM

$$18S = 9C \rightarrow 1S = 1/2 C$$

Therefore, Nike has a comparative advantage in the production of shoes.

Therefore, Nike should specialize in the production of shoes, and IBM should specialize in the production of computers.

The agreeable rate of exchange must be one that is mutually beneficial to both countries. This price is in between the two countries' opportunity costs:

$$2S < \text{Price of } C < 6S, \text{ e.g.: } 1C = 4S$$

$$1/6 C < \text{Price of } S < 1/2 C, \text{ e.g.: } 1S = 1/4 C$$

This price is known as the terms of trade (T.o.T.). The price can be anything that satisfied the inequality and would depend on each agent's relative bargaining power. Another possible example for a valid terms of trade could be:

1C = 5S and therefore 1S = 1/5 C (Both countries still benefit from trade, but these T.o.T. are preferred by IBM than the previous one – can you see why?)

To get the trade line follow this important step:

Value what each country has produced according to the terms of trade.

Nike has produced 18 shoes (S). Now, the terms of trade state that $1S = 1/4 C$, therefore $18 S = 4.5 C$, this gives us the vertical intercept for the trade line.

IBM has produced 9 computers (C). Now, the terms of trade state that $1C = 4S$, therefore $9C = 36 S$, this gives us the horizontal intercept for the trade line.

To convert the dashed line (trade line) to a CPF (thick line), see if the trading partner actually has the amount indicated by the intercept. For example, the vertical intercept for Nike is 4.5 C, and IBM produces a maximum of 9 C, and thus, 4.5 C is possible and therefore the entire line becomes the CPF. However, the horizontal intercept for IBM is 36 S, and Nike produces a maximum of 18 S, and thus, only 18 S is possible, and therefore trade along the trade line will cease at this amount, giving a kinked CPF.

Both countries have gained from trade as their CPFs post-trade are greater than their PPFs pre-trade.

Chapter Appendix B

There are the tutorial solutions to the sample *R.E.A.L.* tutorial – the *Learning Life Lessons* section:

Countries gain from trade as their CPFs post-trade are greater than their PPFs pre-trade.

The conditions for the gains to be as extensive as the model implies are:

- *The transaction and transportation costs must be very low.*
- *The quality of the goods is assumed to be identical. If the qualities are not identical, gains are still possible, but not as extensive as the model implies*

Some industries lose in the short run – think about the computer workers in Nike and the shoe workers in IBM if Nike and IBM were two different countries. The short-term loss needs to be supplemented by government microeconomic policy to retrain workers for the industry that the country has chosen to specialize in. The other option is to allow the free flow of labour between countries, such as in the case of the European Union. Computer workers from the country of Nike would freely migrate to the country of IBM, and shoe workers from the country of IBM would migrate to the country of Nike. Immigration was one of the considerations that voters considered when voting for the UK to Brexit the EU.

Chapter Appendix C – A *R.E.A.L.* assignment

The assignment is also designed around the *R.E.A.L. framework*. The purpose of this assignment is to allow the learner to see the world through the eyes of an economist, by navigating the learner through activities that revolve around the threshold concept of *Market Structures*.

Re-cap and Remind

The purpose of this question is to re-cap and remind students of the basic production and cost functions. Thus, this question mainly assesses base-level understanding, at the first level of Bloom's taxonomy – remember.

Question 01 – Calculation Question (25 marks) – 400-600 Words

The following incomplete tables shows two competitive firms' various costs of producing output.

a) Complete the table for **FIRM A**

Q	TC	TVC	TFC	AC	MC	AVC
1	36					
2						20
3					32	
4	132					
5			20	36		
6		216				

b) Complete the table for **FIRM B**

Q	TC	TVC	TFC	AC	MC	AVC
1	40				20	
2				36		
3						30
4		144				
5					60	
6	288					

c) Assume the market for this product is perfectly competitive and the current market price is \$28.

Determine the quantity produced by each firm and their economic profit/loss. Explain your answer.

d) What will happen to this market in the long run and why?

e) Now suppose that the market price falls to \$16. Do both firms make economic profit? Explain why.

f) If one or both of them makes an economic loss, would they shut down temporarily?

g) Assume these two firms now are actually two factories of one corporation, and the corporation can operate either one or the other at a time. Using the two tables above, determine which factory should be in operation to produce up to a certain level of output. What is this level of output? h) Explain your answer to (g).

Economics Everyday

*The purpose of this question is to assess student understanding of a market structure, such as perfect competition, by relating to an everyday product that students engage with – wheat. Thus, this question assesses the second level of Bloom’s taxonomy – **understand**.*

Question 02 – Theory Question (25 marks) – 400-600 Words

Assume that the world market for wheat is perfectly competitive.

- a) Use a landscaped A4 page to demonstrate the world market for wheat in long run equilibrium conditions. The market for wheat is to be on the left, and a representative farm (firm) is to be on the right.
- b) Explain and discuss the long run conditions above.
- c) Illustrate on this diagram, the short run impact of a growing world population.
- d) Explain and discuss your answer to (c).
- e) Re-draw your diagram in (c). Illustrate on this new diagram what would happen in the long run. f) Explain and discuss your answer to (e).
- g) Explain and discuss what could prevent your answer to (f) from occurring and why.
- h) Explain and discuss what strategies a firm in this situation could adopt to retain what it is losing in (e) and (f).

Application and Awareness

This question now takes student understanding of market structures to a higher level, requiring students to be aware that economics concepts can be applied to analyse a contemporary economics case study. Thus, taking students to higher-level learning in Bloom's taxonomy – apply and analyse.

Question 03 – Application Question (25 marks) – 400-600 Words

Assume that the Sydney clothing market is monopolistically competitive.

- a) Use half an A4 page to illustrate a representative firm in monopolistic competition in long run conditions.

Assume that clothing stores in Macquarie Centre sign 24-month leases with the shopping centre. Further assume that there is a clause in the lease contract that allows Macquarie Centre to increase the monthly rent every 6 months of a signed 24-month lease, in line with market conditions. Even if the rent is re-adjusted (in line with market conditions every 6 months) according to the contract, the lease term still remains at 24 months.

- b) Re-draw your diagram from (a). Show on this new diagram the immediate impact of an increase in rent as described in the situation above.
- c) Explain and discuss your answer to (b).
- d) Explain and discuss the short run decision-making process of the firm, given the situation in (b) and (c).
- e) Re-draw your diagram in (b). Show on this new diagram the long run impact.
- f) Explain and discuss your answer to (e).

Assume that the Retail Store Workers' Union successfully bargains for an increase in casual staff wage rates, despite no proven improvements in worker productivity.

- g) Re-draw your diagram in (a). Show on this new diagram the immediate impact of an increase in casual staff wage rates.
- h) Explain and discuss your answer to (g).

Learning Life Lessons

*This question assesses the highest levels of Bloom's taxonomy – **evaluate** and **create** – in order to learn a life lesson. The context is the changing casino market in Sydney, where there has been discussion in the media about the pros and cons of amending the incumbent casino's exclusive license (The Star), to allow a newer entrant into the market (The Crown). Students will need to evaluate this using the economics concepts that they have learnt. Furthermore, students are invited to create new knowledge by requiring them to research the market and synthesise ideas to create scholarly ideas.*

Question 04 – Research Question (25 marks) – 400-600 Words

- a) Research and explain why 'The Star' (Star City) has been a monopoly in Sydney for several years. You must quote relevant dollar figures, as well as relevant dates, and cite your sources.
- b) Using half an A4 page, illustrate with a diagram of a monopoly, the economic position of 'The Star' over recent years. Use researched data in your diagram.
- c) Research and describe how the Sydney casino industry is currently changing and will be changing over the next few years. You must quote relevant dollar figures, as well as relevant dates, and cite your sources.
- d) Apply economic theory to explain and discuss the changes in (c).
- e) Re-draw your diagram in (b). Show the impact of the events in (c) and (d) on this new diagram. f) Explain and discuss your answer to (e).
- g) Research and explain the differentiation that the new player is offering. Apply economic theory to explain and discuss this differentiation.
- h) Consider the aforementioned Sydney players on a broader stage – across Australia, as well as over the South East Asian region, such as Singapore and Macau. If we consider the casino industry from this angle, what market structure best describes this industry? Explain and discuss your answer.

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Chapter 4: The ‘why’ and the ‘how’ of learning and teaching economics

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Chapter 4



4. The 'why' and the 'how' of learning and teaching economics

Motivation: to disentangle the impact of the transformation of the curriculum via the curriculum re-sequencing from the impact of the integration of threshold concepts into the curriculum via the *R.E.A.L. framework*.

Innovation: I confirm that a synergy results when taking both the 'why' and the 'how' of learning and teaching economics. The synergy of these two innovations via a natural experiment has a proven impact on student learning outcomes and the student learning experience – and this is also confirmed via the student voice.

Chapter 4: The ‘why’ and the ‘how’ of learning and teaching economics

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Abstract

When economics is a core course for students in a business faculty, learners need to be conveyed the ‘why’ and the ‘how’ of learning economics to ensure that the course is relevant, interesting and engaging. To emphasise the ‘why’ of learning, we framed our teaching methodology on threshold concepts – emphasising the transformative and integrative concepts of economics. To incorporate the ‘how’ of learning, we developed a four-step pedagogy based on learning taxonomies. The course grades noted an improvement in learning outcomes. Student surveys demonstrated an improvement in learning experiences. The student voice indicated that attention to curriculum design can alter student perceptions of difficulty. An engaging entry-level economics course is often the only exposure business graduates have to the economics way of thinking and practice.

Keywords: threshold concepts; learning taxonomies; economics curriculum; learning and teaching; higher education

Chapter 4: The ‘why’ and the ‘how’ of learning and teaching economics

Introduction

Initial undergraduate economics courses in universities are mostly service courses that students are completing as part of a major in another discipline in a faculty of business, (Thornton 2012). Furthermore, economics as a major is in steady decline, (Alauddin and Valadkhani 2009; Dwyer 2017). Thus, there is disinterest in the discipline of economics which curriculum developers need to strategically address.

Across the higher education sector, the entry-level undergraduate economics curriculum has been homogenous across institutions and across time (Becker 2000; Alauddin and Valadkhani 2009; Goffe and Kaupe 2014). This traditional undergraduate economics curriculum is built on foundational concepts, (Hedges and Pacheco 2015; Goebel 2017). Foundational concepts are building blocks that traditionally have been considered essential to learning economics. Traditional educational approaches suggest that there are concepts which are foundational or fundamental to the respective discipline. These foundational concepts are the initial stones that must be laid for the learner’s ongoing knowledge and application to be built upon. The disadvantage of this foundational concept approach is that it removes the classroom discussion from the real world, (Davies and Mangan 2005). As discussed in Hedges and Pacheco (2015 p. 54): *“fundamental concepts are considered ‘building blocks’ or ‘core ideas’ that are considered essential to progress learning in the discipline... Their use may result in a ‘theory first’ approach.”* Cousin (2006) also discusses the fact that the foundational concept approach may result in an approach that places the theory at the front end of the curriculum and the more practical and application-based content at the back end of the curriculum.

An alternative way to build an economics curriculum is to focus on threshold concepts. Threshold concepts are the transformative and integrative concepts that are the lens of seeing the world through the eyes of each discipline (Meyer and Land 2003). The threshold concept approach to curriculum design explicitly focuses on building a curriculum around the learning outcomes – the

learning outputs. On the other hand, the foundational concept approach to curriculum design explicitly focuses on building a curriculum around building blocks – the learning inputs.

When designing a curriculum according to the foundational concept approach, the curriculum focuses on the accumulation of learning inputs. Once the learning inputs are accumulated, the learner begins to see the world through the eyes of an economist – thereby achieving the learning outcomes of the course. On the other hand, when designing a curriculum according to the threshold concept approach, the curriculum focuses on incorporating the learning outputs at the outset without leaving these learning outcomes right at the end of a course. When an economics course is a core course for non-economics majors in a faculty of business, this is important because these non-economics majors will complete just one introductory course of economics in their entire degree program. If we design a curriculum via the traditional foundational concept approach, students may not be given the chance to observe the world through the eyes of an economist, the lens of viewing the world that is discussed in Meyer and Land (2003).

To transform the traditional economics curriculum, curriculum developers need to actively re-think the sequencing of this traditional content so that learners are engaged with the learning outputs of the threshold concepts of economics from the beginning. This can promote interest in the discipline of economics when learners begin to see the relevance of economics when they see economics at work in their everyday lives. Such a re-sequencing of this content will require flipping the traditional sequencing of topics in the standard entry-level curriculum. This would entail bringing the final topics of the four market structures at work to the beginning of the curriculum, and the initial topics of elasticity and efficiency to the end of the curriculum. Students will then be able to see the context of economics right at the outset, where real world firms are making economics decisions to allocate their scarce resources and maximise their well-being via maximising profits. Later in the curriculum, learners will then be able to place the ‘workings behind the scenes’ of elasticity and efficiency towards the end of the curriculum. Learners are then engaged with the course from day one, because the course design focuses on seeing through the eyes of an economist, the lens of viewing the world, that is the threshold concepts of economics (Meyer 2003). The curriculum is not compromising on the depth of economics content, since after students begin to see the world through the eyes of an economist, learners are then be introduced to the inputs, i.e. the foundational concepts that are ‘working behind the scenes’.

Introducing learners to the curriculum output at the outset, rather than the curriculum input, has the potential to engage students in the discipline of economics. Seeing economics in practise in the real world at the beginning of a curriculum, rather than the foundational building blocks of theory, has the potential to promote interest and engagement in economics.

In this study, we transform a traditional economics curriculum by re-sequencing the standard content by using the threshold concepts of economics as the guide to inform this re-sequencing. This research does not address the ‘*what*’ of economics that should be taught – which is a different, yet valid research question (Freeman 2010; Mearman, *et. al.* 2011; Gwartney 2012). Instead this research focuses on the ‘*why*’ of learning and teaching economics, and the ‘*how*’ of learning and teaching economics. We investigate whether an explicit formulation of the curriculum around threshold concepts would improve student learning outcomes, as well as the student learning experience.

To achieve this objective, this study integrates the previous research of threshold concepts in economics curricula into a single curriculum. Studies on threshold concepts in economics curricula each address one aspect of the economics curriculum, such as the threshold concept of opportunity cost (Shanahan 2016). This research goes further by integrating all¹⁵ of the agreed upon threshold concepts of economics (Davies and Mangan 2005) into one economics curriculum, as well as integrating threshold concepts across all parts of the economics curriculum, from lectures, to tutorials, to learning and teaching activities, as well as assessment design.

The contribution of this study is that we investigate integrating all the threshold concepts of economics into one curriculum, we integrate threshold concepts into every learning and teaching activity, we transform the teaching sequence as well as the learning progression by re-sequencing the standard content around the lens of threshold concepts, and we gauge the student voice on which threshold concepts are important and which threshold concepts are difficult to learn.

¹⁵ As noted later in this paper, the economics course that was researched was a microeconomics course. Two of the ten threshold concepts of economics do not apply to a microeconomics curriculum, and these two threshold concepts (*real versus nominal* and *cumulative causation*) are part of the complementary macroeconomics curriculum. As such, our research integrated all the threshold concepts that are relevant to a microeconomics curriculum

Literature Review

In the United Kingdom (UK), the threshold concepts of economic are being encouraged to be used as a guide when developing economics curricula (Karunaratne, Breyer and Wood 2016). The UK's tertiary education regulator, the Quality Assurance Authority (QAA) has created a Benchmark Statement for Economics (2007, 2015) which outlines the economics curriculum framework for higher education providers. This framework is based on four pillars:

- Subject knowledge and understanding.
- Subject specific skills.
- The transferable concept.
- Numeracy.

The first of these four pillars focus on the content of economics itself – ‘subject knowledge and understanding’. Here the UK framework outlines the core content that a graduate of economics must possess. The pillars of: subject specific skills, the transferrable concept, and numeracy are pillars that are applicable beyond pure economic contexts. The Benchmark Statement for Economics identifies that an economics curriculum also caters to students who may be choosing a major in another discipline (QAA 2007, section 2.3 and 2.4). The second pillar: ‘subject specific skills’ recognises that: “Some of the attributes that a graduate in economics possesses are generic and not specific to the study of the subject. Their enhancement would be part of any degree program,” (QAA 2007, section 5.1). Here, the subject specific skills are determined to be: abstraction; analysis, deduction and induction; quantification, evaluation and design; and framing.

Within the third pillar: ‘the transferable concept’ is an explicit recognition of the threshold concepts of economics, which are transferable to other subject areas as they are transformative and integrative – characteristics of threshold concepts: “From learning economic principles, the typical student acquires a facility with some key concepts that are present in most of the decision problems that they are likely to face subsequently in their careers,” (QAA 2007, section 5.4). What are deemed as the transferable concepts within the UK framework are the threshold concepts of economics which are listed in the ‘Embedding Threshold Concepts in First Year Undergraduate Economics’ (ETC project).

The ETC project was funded by the Higher Education Funding Council for England (HEFCE) and the Department for Employment and Learning (DEL) – in the UK, under the Fund for the

Development of Teaching and Learning (Davies and Mangan 2005). At the end of the project, the group agreed on the importance of the recognition of threshold concepts within economics regarding the learning and teaching of the discipline (Davies and Mangan 2005). The threshold concepts developed by the ETC Project as reported by Davies and Mangan (2005) are:

- Economic Models
- Opportunity Cost
- Marginal Analysis
- Equilibrium and Disequilibrium
- Markets – Interactions and Structures
- Elasticity
- Efficiency
- Comparative Advantage
- Real versus Nominal
- Cumulative Causation

As discussed in Karunaratne, Breyer and Wood (2016), there is some critique of the threshold concept approach in economics (O'Donnell 2010; Tang and Robinson 2010). However, published work in books such as Davies (2012), tertiary regulations such as QAA (2007, 2015), and journals such as Shanahan, Foster and Meyer (2006), Cousin (2006), Davies and Mangan (2007), Hedges (2014), Shanahan (2016), and Meyer (2016) highlight the acceptance of both the list of threshold concepts, as well as the threshold concept approach to pedagogy in economics.

The University of Auckland re-thought their economic curriculum around the threshold concepts of economics (Hedges and Pacheco 2015). These curriculum designers aimed to adopt a 'less-is-more' approach to cater to a diverse student cohort. To invigorate the curriculum, the designers recognised that their curriculum would need to be framed upon the threshold concepts of economics. Unlike these researchers, our research does not address the '*what*' of teaching and learning economics. Rather, our research investigates whether attention to threshold concepts when designing a curriculum can help learners realise the '*why*' of learning economics (Burdina and Sasser 2018), and thus improve student learning experience for a given set of curriculum content, as well as improve the student learning outcomes.

The aim of our curriculum design was to integrate all the threshold concepts of economics into an already existing curriculum, as well as integrate the lens of threshold concepts into every learning and teaching activity. This would then present the ‘*why*’ of learning economics to engage students throughout the semester. As the threshold concepts agreed upon by the ETC Project are discussed in the literature since (Cousin 2006; Shanahan, Foster and Meyer 2006; Hedges and Pacheco 2015; Shanahan 2016; Meyer 2016), the researchers utilised this list of threshold concepts to transform the curriculum of this entry-level microeconomics course by integrating these threshold concepts. The objectives are to (1) enhance the student learning and experience, and (2) enhance the student learning outcomes of the course.

The scope of this microeconomics syllabus did not allow the researchers to address the threshold concepts of: *real versus nominal* and *cumulative causation*. This is because the syllabus content pertaining to these threshold concepts is covered in the complementary macroeconomics syllabus instead of the microeconomics syllabus. The macroeconomics course is beyond the scope of this research project where we solely focus on the microeconomics course in our current research.

Design features of the entry-level economics course

An entry-level microeconomics course (ECON111), at a large Australian university was transformed and investigated over four semesters of study by integrating threshold concepts. All undergraduate students studying in the Faculty of Business at this university have ECON111 as a core course in their degree program. These programs encompass the degrees of: Bachelor of Actuarial Studies, Bachelor of Applied Finance, Bachelor of Business Administration, Bachelor of Business Analytics, Bachelor of Business Leadership, Bachelor of Commerce, Bachelor of Economics, and Bachelor of Marketing and Media. As part of a Bachelor of Commerce, students choose one or two majors in: accounting, business information systems, decision science, economics, entrepreneurship, finance, human resources, international business and marketing. The different degree programs and different majors attract students with different motivations for studying economics. Due to the subjects studied in secondary education, as well as the differing entry criteria into these programs, the students come from a diverse range of academic backgrounds (Karunaratne, Breyer and Wood 2016).

The course has an enrolment of approximately 1,400 students per semester. ECON111 is a service course, and thus this course provided us with a suitable sample to have its curriculum transformed

by the integration of threshold concepts. According to Gajwani and Miron (2015) it is possible to create an active and engaging community of learners in a large undergraduate economics course.

This research integrates into a single curriculum, the previous research on threshold concepts in economics curricula, as well as all the agreed threshold concepts of economics that pertain to microeconomics. We integrate all these threshold concepts into every aspect of the economics curriculum, including: lectures, tutorials, assessments, and feedback. In this section, we first discuss how threshold concepts were integrated into the curriculum. In the next section on ‘curriculum re-sequencing’ we will discuss how we transformed the sequencing of the content with an eye for threshold concepts.

This research does not change the content that is delivered in the course, ECON111. This is because ECON111 is a service course for the Faculty of Business, as it is a core course for students of all majors. The content of each service course is decided at a program level, thus any changes to the content needs to be executed at the program level. This research takes the content as given and formulates a unique approach to delivery, emphasis and sequencing, by focusing on threshold concepts.

The proposed advantage of the threshold concept approach in addressing this diverse student cohort is due to the fact that course is a service course for the Faculty of Business. Less than 10% of the students in the course would choose to major in economics, whereas more than 90% of the students would choose to major in one of the discipline areas highlighted above. As the threshold concept approach is to train learners to see through the eyes of an economist, this is a transferrable skill that students can take away to any endeavour of their lives. As threshold concepts are transformative and integrative, a focus on such concepts would make economics relevant and engaging to learners beyond the discipline of economics.

Data collection

By way of a natural experiment over several semesters of study, this research was able to separate the impact of the transformation of the sequencing of the curriculum content, and the impact of the integration of threshold concepts into every curriculum activity.

To measure the success of the curriculum design, we investigate changes in the student learning outcomes, as well as changes in the student learning experience. This research investigates whether the integration of all the threshold concepts of economics into every learning and teaching activity, as well as the transformation of the teaching sequence and learning progression improves the student learning experience, as well as the student learning outcomes.

When a curriculum is constructively aligned (Biggs 1996), the transformation of the learner is judged by the learner's ability to see the world through the lens, the portal, and the way of thinking as an economist (Neal 2013) – achieving the learning outcomes of the course as noted by the final course grade. We evaluate the student learning experience by way of an end-of-semester student survey. Furthermore, a third metric was used to assess the student voice using a separate survey to assess perceptions of importance of threshold concepts as well as the difficulty of threshold concepts.

Lectures

Lectures are large group interactive teaching with around 500 students in one lecture hall generally of two hours' duration. The threshold concepts were incorporated into lectures. Prior to each lecture, students are provided a set of lecture notes. The only modification of the lecture notes was that the threshold concept/s were highlighted at the beginning and when a threshold concept is explicitly being utilised in the articulation of an economic concept. The lectures are designed to cover most of the content of the curriculum. Lectures are interactive as they incorporate: polling software to engage students, time for students to solve problems together, as well as in-lecture experiments that demonstrate the threshold concepts in action (Emerson and English 2016).

Tutorials

Tutorials are small group learning with around 25-30 students facilitated by a tutor. The tutorials are designed to complement lectures via a group discussion to engage the threshold concepts of economics, where this discussion is moderated by a tutor. All students are guaranteed a seat in a tutorial.

As an example, 'Economics models' is an agreed upon threshold concept of economics (QAA 2015; Davies and Mangan 2005). A small group discussion is conducive to engage students to evaluate and critique economic models, as well as to discuss and decide which economic models

are applicable to specific real-world scenarios (Davies and Mangan 2005). While the tutor facilitates the discussion, students can evaluate and critique their cases with peers. This is preferable to engaging the threshold concept of ‘Economic models’ in a lecture, where the lecturer themselves would evaluate and critique the economic models, as well as discussing and deciding which economic model is the best fit for each unique real-world scenario (Davies and Mangan 2005). A tutorial discussion in this context would enable every student in attendance to take part in a face-to-face discussion, and have the full attention of an academic who is the moderator of the discussion, which would be difficult to ensure in a large lecture setting. Examples and case-studies are presented to students in tutorials, where students are encouraged to engage the threshold concepts of economics in small groups. Small groups discuss how each model fits, or does not fit each real-world scenario, especially by critically reviewing the assumptions of the economic model that is being discussed. Meyer and Land (2006) discusses that this approach helps to engage a diverse student cohort.

The threshold concepts of economics are identified in lectures, and then they are strategically integrated into tutorials (Davies and Mangan 2008). These researchers developed three types of activities: ‘reflective exercises’, ‘problem-focused exercises’ and ‘threshold network exercises’. Utilising the approach of Davies and Mangan (2008), in our course, we scaffolded tutorials into four steps, informed by a revision of Bloom’s Taxonomy (Anderson, Krathwohl, *et. al.* 2001):

- *‘Re-cap and Remind’* – informed by the ‘reflective exercises’ of Davies and Mangan (2008), where students reflect, re-cap and remind themselves of the concepts and content covered in the prior week’s lecture.
- *‘Economics Everyday’* – where the concepts and the content are connected to an everyday example from the students’ own life experiences.
- *‘Application and Awareness’* – informed by the aforementioned ‘problem-focused exercises’ of Davies and Mangan (2008). Here, the ‘economics everyday’ activity highlights how the concepts and the content can be utilised in an everyday real-world situation; whereas the ‘application and awareness’ activity asks students to apply their knowledge to solve a problem by utilising the concepts and content of the prior week’s lectures.
- *‘Learning Life Lessons’* – informed by the aforementioned ‘threshold network exercises’ of Davies and Mangan (2008). This is the last activity for the tutorial, where students are encouraged to critically evaluate a contemporary economic scenario by creatively utilising the concepts and content of the prior week’s lectures.

We represent this scaffolding of tutorials to engage the threshold concepts of economics as, ‘*The R.E.A.L. framework*’ for the learning and teaching of economics. ‘R.E.A.L.’ is an acronym that summarises the four-part scaffolding – Re-cap and remind; Economics everyday; Application and awareness; Learning life lessons. This research incorporates the exercises of Davies and Mangan (2008) into a revision of Bloom’s Taxonomy (Anderson, Krathwohl, *et. al.* 2001), to create ‘*The R.E.A.L. framework*’ for scaffolding the teaching of economics. Such scaffolding is supported by Dowd, *et. al.* (2015) which exhibits how structured workshops can result in improved reasoning when it comes to undergraduate writing.

The assignment

The R.E.A.L. framework is again used to scaffold the student’s within-semester take-home assignment. Rowntree (1987) notes that the assessment program needs to be a key teaching tool instead of acting primarily as a measurement tool. These authors also note the research of Gibbs (1999), where the goal is to use the assessment to encourage engagement and integrative learning. A take-home assignment gives students the opportunity to explore the assignment questions with the threshold concept lenses and gateways of thinking and practice (Meyer and Land 2003), by giving students to opportunity to reflect on their knowledge. Boud (2000), discusses this approach to assessments as assessment *for* learning, to complement assessments *of* learning. The assignment provides an opportunity to integrate the economic concepts that they have learnt, which is a characteristic of a threshold concept. Without the lecturer delivering the entire curriculum from the stage, students reflect on what they have learnt and are challenged to integrate the concepts into specified real-world scenarios. The assignment language used is informed by the research of Dyer (2013) with effective strategies in the framing of assessment questions without comprising on their rigour or quality.

Weekly quizzes

Weekly quizzes were utilised to re-cap and remind students about the weekly content building upon the first tier of the ‘*R.E.A.L. framework*’ – ‘re-cap and remind’. Our research is informed by the work of Shanahan, Foster and Meyer (2006) where students were given weekly multiple-choice quizzes to examine the acquisition of the basic economic content.

The final examination

The largest component of judgment of a student's achievement of a course's learning outcomes is via a final examination. Threshold concepts are integrated into the final examination, by presenting 60% of the final examination paper as unseen questions based on a seen case study. Here students must utilise the lens of the threshold concepts of economics and view the world as an economist. Students are encouraged to foresee the questions that economists would ask. Thus, this draws upon the 'threshold network exercises' of Davies and Mangan (2008).

Grading

Ultimately, the grade received by student is based on the attainment of the learning outcomes of the course. The grade is not based on the attainment of the threshold concepts. Our research is thus examining whether an explicit incorporation and integration of threshold concepts into an economics curriculum can transform the individual student into seeing the world through the lens, the portal, and the way of thinking as an economist – and thus, achieve the learning outcomes of the course.

Curriculum re-sequencing

This research also *transforms* a traditional economics curriculum that is built on the foundational concepts approach by re-sequencing this content according to the threshold concepts of economics. A vast literature exists on the importance of didaktiks, teaching sequences, and learning progressions, in the engagement of students and the achievement of student learning outcomes (Duncan and Hmelo-Silver 2009; Duschl, Maeng and Sezen 2011; Furtak, Morrison and Kroog 2014). Therefore, the investigation of the teaching sequence of topics in our introductory economics curriculum is relevant to curriculum redesign.

Through experience in teaching the course for over a decade, the researchers were able to identify where the threshold concepts of economics are best engaged in the pre-determined content of this course. The researchers then used this knowledge to transform the weekly teaching sequence of this course. This ensured that the weekly teaching sequence was guided by the learning outputs – threshold concepts of economics, rather than a weekly teaching sequence that was guided by the building blocks – foundational concepts. The foundational concepts approach places the simplest ideas towards the beginning of the course, whereas the threshold concepts approach places the threshold ideas towards the beginning. The aim of this research was to use the lens of threshold concepts, to explicitly re-think the weekly teaching sequence of the semester. Prior to the period of research study, the researchers piloted this transformed weekly teaching sequence in a summer semester. This trial was successful which was evidenced by improvements in the student experience survey results as well as the improvements in the overall grade distribution and hence learning outcomes.

In this study, we worked through the pre-determined curriculum content of the course and re-sequenced the weekly teaching according Table 1. Table 1 shows both the traditional sequencing of the content, as well as the transformed sequencing of the content.

Table 1 – Curriculum re-sequencing

Week	Traditional sequence of content	Transformed sequence of content
01	Introduction to Economics	Introduction to Economics and the PPF
02	PPF and Comparative Advantage	Market Structures – Producer Theory
03	Demand and Supply	Market Structures – Perfect Competition
04	Elasticity	Demand and Supply
05	Efficiency	Market Structures – Monopoly
06	Government Actions in Markets	Market Structures – Monopolistic Competition
	Two-week mid-semester break	Two-week mid-semester break
07	Externalities	Elasticity
08	Consumer Theory	Efficiency
09	Market Structures – Producer Theory	Externalities
10	Market Structures – Perfect Competition	Government Actions in Markets
11	Market Structures – Monopoly	Consumer Theory
12	Market Structures – Monopolistic Competition	Game Theory – Oligopoly
13	Game Theory – Oligopoly	Comparative Advantage

As can be seen from in Table 1, there was no change in the content of the course. The researchers were able to utilise the research and literature on threshold concepts, the existing content of the course, as well as the researchers' own experience to re-structure a new teaching sequence to deliver the intended learning outcomes of the course – the learning outputs, i.e. the threshold concepts of economics. Karunaratne, Breyer and Wood (2016) discuss the rationale behind the specifics of this curriculum re-sequencing, as well as the perceived and achieved advantages this curriculum re-sequencing. The discussion in Karunaratne, Breyer and Wood (2016) is summarised below:

While there has been a transformation of the teaching sequence and learning progression in the curriculum, we highlight the main changes to the re-sequencing in Table 1. Traditionally, the foundational concepts of *elasticity*, *efficiency*, and *government actions* were presented to learners right at the beginning of the course. During the mid-semester break, which is for two weeks at this university, students were given a research-based, application-style assignment on these foundational concepts. Once students returned from their mid-semester break, students were introduced to the more difficult concept of *market structures*, as this topic would be the culmination of the curriculum via the foundational concept approach. The threshold concept of *market structures*, requires the foundational concepts of *elasticity*, *efficiency*, and *government actions*, in the foundational concept approach to curriculum design, as the concept of *market structures* incorporates all these foundational concept building blocks.

In our study, with the transformed teaching sequence and learning progression, the threshold concept of *market structures* is moved to the first half of the semester, engaging the students in this more difficult concept, but allowing the student to see how markets work and interact – a learning outcome of the course. During the two-week mid-semester break, students were then given a research-based application-style assignment on this threshold concept of market structures and interactions.

The assignment required students to find their own examples of the different market structures in the economy that they themselves experiences and interacted with. Learners had to not only find their own examples, but they had to critically evaluate their findings based on the theory that they had learnt. The opportunity to find their own examples that learners themselves experiences and interacted with gave learners the opportunity to see through the eyes of an economist, by seeing these markets at work in the contemporary world. Furthermore, the assignment gave students the opportunity to query what was ‘working behind the scenes’, that is, the foundational concepts of *elasticity*, *efficiency*, and *government actions in markets*, because some of the assignment questions encouraged students to think about the missing pieces in their knowledge. Once the semester re-convened, students were then introduced to these missing pieces, the foundational concepts that were working behind the scenes of the threshold concept of *market structures*.

We believe that this approach, of presenting the threshold concepts of economics at the outset, presents the learning outcomes of such a course as early as possible, and engages the student with seeing economics in their contemporary world, so that they are inspired to learn the course’s

content, which includes the foundational concepts. Furthermore, the missing pieces of the foundational concepts encourages learners to query what they have learnt and encourage them to journey on in the course's curriculum where their thirst for these foundational concepts is inspired by them seeing the 'why' of learning economics in the first place.

Control and experiment

During the four semesters of the period of research between, a natural experiment resulted which assisted in controlling the impact of the re-sequencing of the content. One semester during this period, which we will call: *Semester A*, ran in the traditional sequence of topics, even though threshold concepts were integrated into the curriculum. Whereas, three of the semesters in the period of research, which will call: *Semester X*, *Semester Y*, and *Semester Z*, ran in the transformed re-sequencing of topics, with threshold concepts integrated into the curriculum. Thus, while all four semesters during the research period involved the integration of threshold concepts into the curriculum, only three of the four semesters experienced a transformed curriculum sequencing. For comparison purposes we use one semester before the study period, which we call *Semester N*. In *Semester N*, threshold concepts were neither integrated into the curriculum, nor was the curriculum re-sequenced for threshold concepts. Across all *Semesters N*, *X*, *Y*, *Z*, and *A*, the content covered was identical, the course convenor (co-ordinator) was identical, the lecturers were identical, and the team of tutors was similar. The integrity of the curriculum's content, the teaching activities, and the assessment, was ensured by a rigorous moderation process which exists within the economics department, independent of this research. Nevertheless, each semester has a new cohort of students so whilst we have controlled as much as possible, there will still be some variation in the cohorts.

Results

Effective teaching is essentially a constrained optimisation problem (Hultberg and Calonge 2017). In our research, we transformed the curriculum of an entry-level microeconomics course via the integration of threshold concepts, as well as re-sequencing the course's content. The objective was to:

- enhance the student learning and experience, and
- enhance the student learning outcomes of the course.

These are the two metrics that can be used to evaluate the effectiveness of a transformed and re-designed curriculum (Karunaratne, Breyer and Wood 2016). Furthermore, a third metric was used to assess the student voice. At the end of the semester, students were presented with the list of threshold concepts and asked to list five concepts that they deemed 'essential' in the learning of economics, as well as list five concepts that they deemed 'difficult' in the learning of economics.

The student learning experience

To evaluate the student experience of the curriculum, a student survey was conducted at the end of the semester. This survey is part of the university policy, with specific questions included by the researchers to gauge the student experience of the curriculum transformation in *Semesters X, Y, Z, and A*. The number of valid surveys and the survey response rate are presented in Table 2.

Table 2 – Survey response rates

	Semester X	Semester Y	Semester Z	Semester A
Number of valid surveys	599	641	401	332
Response rate	39.8%	52.5%	27.2%	23.2%

The university and national benchmark require a response rate of 25% of the student cohort. Thus, *Semesters X, Y, and Z*, have high response rates, based on this benchmark, while *Semester A* is just below the benchmark. One possible explanation for the markedly lower response rate in *Semester A* could be due to the reduced student experience of the course in *Semester A* which is discussed in a later section. Other than this, the high response rate allows us to draw useful conclusions later in this paper. The reduced response rate in *Semester A* compared to other semesters could also be indicative of reduced student engagement in the course in *Semester A* compared to prior semesters. This reduction in student engagement is discussed after the results are presented in Table 4.

The survey consisted of 22 questions, which consisted of both Likert Scale ranking questions as well as open-ended free response questions. Five of the Likert Scale ranking questions were relevant to evaluating the impact of the curriculum re-design. These questions (using the coding system of the survey) are displayed in Table 3. Students respond on a standard five-point Likert Scale with options ranging from ‘Strongly Agree’ (a score of 5) to ‘Strongly Disagree’ (a score of 1).

Table 3 – Survey questions

Question Code	Survey statement
CRU05	The unit content was organised in ways that assisted my learning.
CRU06	Teaching sessions (face-to-face and/or online) kept me engaged in the unit.
CRU07	The unit’s learning activities (e.g. assessments, in-class or online discussions and exercises) were effective in developing my understanding.
CRU11	This unit contributed to my development of one or more of the MQ Graduate capabilities.
CRU12	This unit challenged me intellectually.

The average of student survey responses, for each survey question, appears in Table 4. The semesters are presented in chronological order.

Table 4 – Student average responses out of 5.0

Question	Semester N	Semester X	Semester Y	Semester Z	Semester A
CRU05	4.3	4.7	4.7	4.8	4.6
CRU06	4.1	4.5	4.5	4.6	4.4
CRU07	4.1	4.6	4.6	4.6	4.3
CRU11	4.0	4.3	4.4	4.4	4.3
CRU12	4.3	4.4	4.5	4.6	4.4

According to Table 4, the student feedback indicates that the curriculum transformation of the curriculum via re-sequencing, as well as the integration of threshold concepts, delivered an improved student experience of the curriculum. Across all the five questions, and across all semesters of the research period, there were improvements in the student responses compared to *Semester N*. The responses across *Semesters X, Y, and Z* were very similar where all three semesters experienced the same curriculum transformation. There is evidence that ‘learning-by-doing’ by the teaching team, also contributes to some improvement in the student learning experience, as there is a slight increase in the student learning experience between *Semester X* to *Semester Z*.

According to Table 4, there is evidence that the transformation of the curriculum does play a role in enhancing the student learning experience, independent of the integration of threshold concepts into the curriculum. As noted earlier, *Semester A* involved the curriculum of *Semester X, Y, and Z*, without the re-sequencing. Furthermore, *Semester A*, was the last semester of the period of research, thus, any impact of ‘learning-by-doing’ for the teaching team should have been positive, if the re-sequencing had no part to play in the student learning experience. Across all the five questions, the average responses worsened in *Semester A* compared to *Semester Z*. For *Semester A*, the student feedback indicates that the curriculum without the transformed curriculum re-sequencing resulted in a reduced student experience compared to the transformed curriculum sequencing experienced in *Semester X, Y, and Z*.

The student learning outcomes

Insofar that the curriculum is constructively aligned (Biggs 1996), the transformation of the student is judged by the student's ability to see the world through the lens, the portal, and the way of thinking of an economist – achieving the learning outcomes of the course via the final course grade. In assessing student learning outcomes, this university awards grades based on the criteria outlined in Table 5:

Table 5 – Grade descriptors

Grade name	Letter grade	Standardised Numerical Grade range
High Distinction	HD	85 – 100
Distinction	D	75 – 84
Credit	Cr	65 – 74
Pass	P	50 – 64
Fail	F	0 – 49
Fail Absent	FA	
Fail Withdrawn	FW	

Table 6 reports the results of the pooled semesters of *Semester X* and *Y* against *Semester N*. As noted earlier, *Semester X* and *Y* involved a curriculum integrated with threshold concepts, as well as a curriculum re-sequencing around threshold concepts. However, *Semester N* involved a traditional curriculum built on foundational concepts. This university has guidelines which prevent these researchers from publishing the absolute number of students within each grade category. As a result, we report the percentage change in the proportion of each grade in *Semester X* and *Y*, relative to *Semester N*. The university has a policy of standards-based assessment and not norm-referenced assessment so that an improvement in the grade distribution demonstrates that more students achieved the required standard.

As can be seen in Table 6, there is a difference in the grade distribution in *Semester X* and *Y* compared to *Semester N*, where the grades have improved. This demonstrates that there has been

an improvement in the achievement of learning outcomes. There was a proportionate increase in the higher grades: High Distinction (HD) and Distinction (D). At the same time, there was a proportionate decrease in the lower grades: Pass (P) and Fail (F). ‘All Fails’ is a pooled category that combines: Fail (F), Fail Absent (FA) and Fail Withdrawn (FW). This pooled category exhibits a 37.6% reduction in the failure rate. The increase in the higher grades, and the decrease in the lower grades, indicates that overall, there the curriculum re-design resulted in an improvement in the student learning outcomes.

Table 6 – Student grade distribution change

Grade	Percentage Change over Semester N – Semester X and Y
HD	50.9%
D	29.5%
Cr	1.3%
P	-10.2%
F	-47.2%
FA	-16.3%
FW	-49.5%
All Fails	-37.6%

Table 7 – Student grade distribution change

Grade	Percentage Change over Semester Z – Semester A
HD	-84.4%
D	-54.1%
Cr	-8.0%
P	+61.9%
F	+280.0%
FA	-14.3%
FW	+100.0%
All Fails	+138.0%

In Table 4, the differential in results between *Semester A* and *Semester Z* is a smaller difference than the differential in results between *Semester N* and *Semester Z*. Table 7 reports the results of *Semester A* against *Semester Z*. As noted earlier, *Semester Z* involved a curriculum integrated with threshold concepts, as well as a curriculum re-sequencing around threshold concepts. *Semester A* involved a curriculum integrated with threshold concepts while still retaining the traditional sequencing of content based on the foundation concepts approach. We report the percentage change in the proportion of each grade in *Semester A*, relative to *Semester Z*. As can be seen in Table 7, there was a deterioration in the grade distribution in *Semester A* compared to *Semester Z*, which indicates that there has been a deterioration in the achievement of learning outcomes. The higher grades: HD, D and Cr proportionately fell, whereas the lower grades: P and F which proportionately rose. Furthermore, for the pooled category of ‘All Fails’, there was a 138% increase in the failure rate. Thus, when implementing the transformed curriculum without the re-sequencing of content, there was an overall deterioration in the student learning outcomes.

Our research concludes that the transformation of an economics curriculum results in a significant improvement in both the student learning experience, as well as the student learning outcomes.

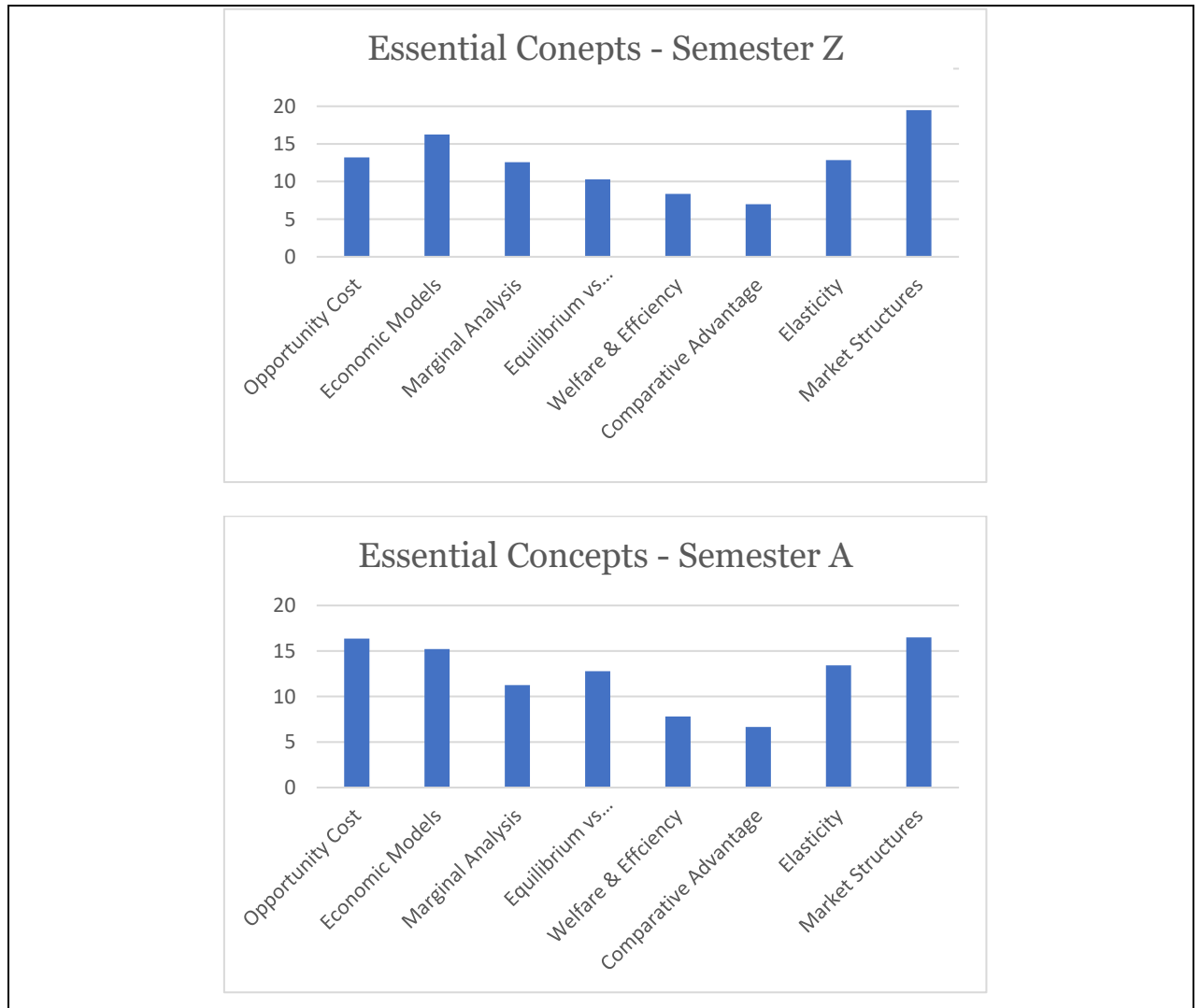
Across all *Semesters N, X, Y, Z, and A*, the content covered was identical, the course convenor (co-ordinator) was identical, the lecturers were identical, and the team of tutors was similar. The integrity of the curriculum's content, the teaching activities, and the assessment, was ensured by a rigorous moderation process which exists within the economics department, independent of this research. Nevertheless, each semester has a new cohort of students, so whilst we have controlled as much as possible, there will still be some variation in the cohorts. *Semesters X and Y* were in one calendar year, while *Semester Z and A* were in the subsequent calendar year. There was a structural break in the cohort in the year of *Semesters X and Y*, compared to the prior *Semester N*. This being that the university had a policy change that resulted in accepting students with lower academic entry standards with the aim of making higher education accessible to a larger group in society. As such, the improvement in the learning outcomes in *Semesters X, Y, and Z*, compared to *Semester N* can possibly be attributed to the pedagogical changes made to the course, rather than an improvement in the student cohort.

The Faculty of Business has five core courses that are common to all undergraduate degree programs. During the period of study, when comparing the results for these core courses, the same reported improvement in student learning outcomes did not occur when comparing *Semester N* to *Semesters X, Y, and Z*. For some of these core courses, there was in fact a deterioration in the student learning outcomes in terms of the grade distribution.

The student voice

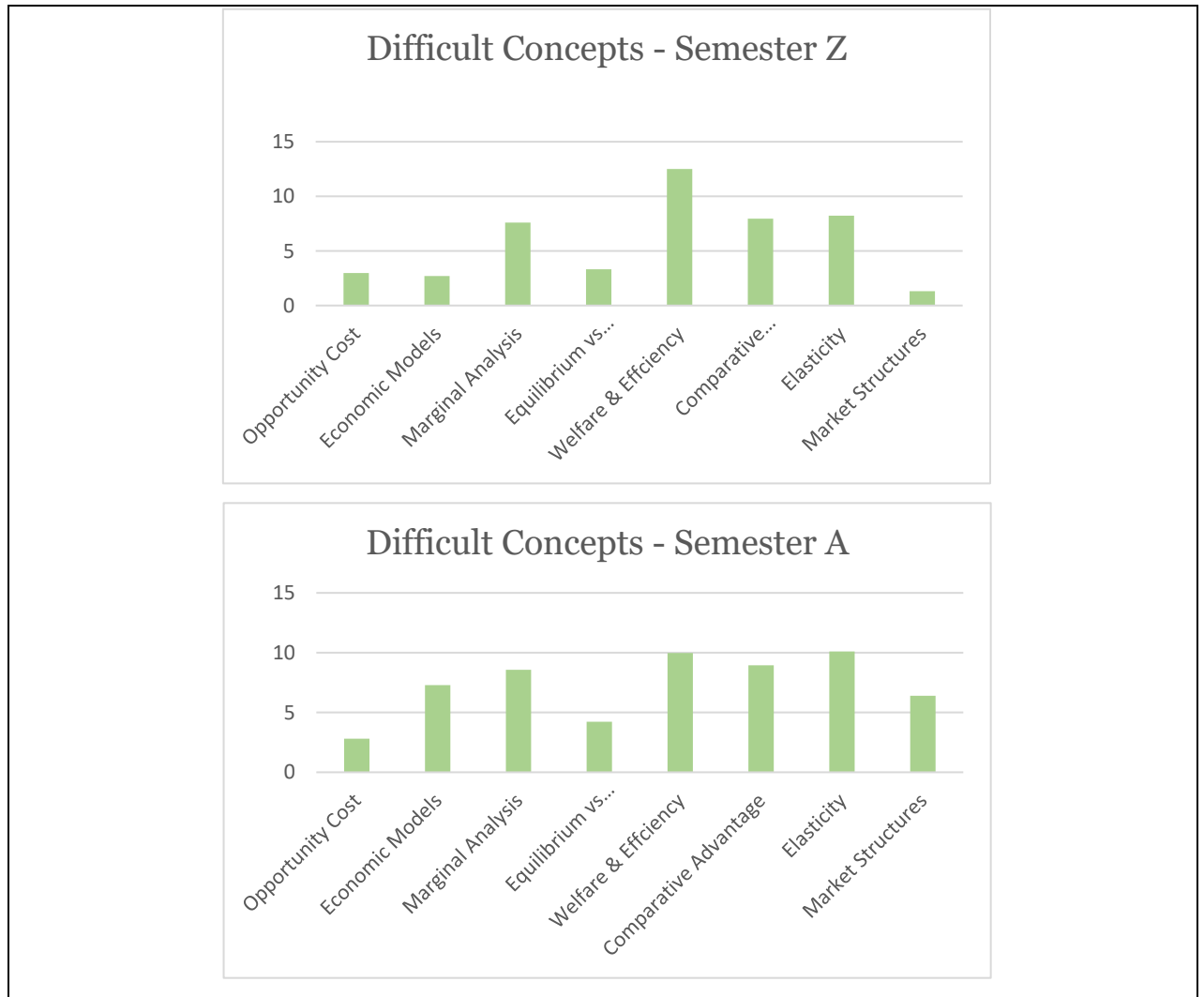
At the end of the semester (*Z and A*), students were presented with the list of threshold concepts and asked to list five concepts that they deemed 'essential' in the learning of economics, as well as list five concepts that they deemed 'difficult' in the learning of economics. Graph 8 displays the histograms of relative frequency of student responses for the essential concepts of economics. Graph 9 displays the histograms of relative frequency of student responses for the difficult concepts of economics. All graphs are presented in relative frequency formats due to the differing student enrolments and response rates in each semester. The results are for *Semester Z* with the transformed topic sequencing and *Semester A* with the traditional topic sequencing.

Figure 8 – The essential concepts of economics



In Figure 8, it is interesting to note that, despite the difference in topic sequencing in *Semester A* compared to *Semester Z*, the relative frequency graphs for the two semesters have roughly the same shape. There is a match in the peaks as well as the troughs in the two relative frequency graphs in Figure 8. Furthermore, it is interesting to note that in both semesters, students felt that the concept of *market structures* was the most essential concept that they learnt in the course, despite the order of learning. Thus, there is evidence that the sequencing of the topics has little, if any impact on student perceptions of what the essential concepts of the course are. This then achieves the desired learning outcomes of the courses, without skewing students' attention to the importance of lack thereof, of different economic concepts. A contributing factor to the similarity in the responses across the two semesters could also be due to the fact that the amount of class time spent on each threshold concept was approximately the same across both semesters as there was no change to the content that was taught, but simply an emphasis on the 'why' and the 'how' of learning the content.

Figure 9 – The difficult concepts of economics



Here, there is an interesting contrast in the two relative frequency graphs in Figure 9. In *Semester Z*, the concept of *market structures* was considered the least difficult concept of the course, whereas in *Semester A*, this was considered of medium-level difficulty. This difference is notable because the concept of *market structures* takes up four weeks in the entire thirteen-week course, whereas the concepts of *opportunity cost*, *economic models* and *marginal analysis* are all taught in a single week. Thus, there is evidence, that a re-sequencing of topics by presenting material earlier in the course, can make the troublesome threshold concepts, such as the concept of *market structures*, relatively easier for students.

Conclusion

The researchers have applied and tested two alternative economic curriculum frameworks around threshold concepts – one that integrates threshold concepts into an existing economics curriculum, and one that goes further by transforming the curriculum by re-sequencing the content. Our research has shown that the utilisation of threshold concepts in both curriculum frameworks does improve both the student learning experience as well as the student learning outcomes. However, the transformation of the entire curriculum sequencing for threshold concepts has a better impact on the student learning experience and the student learning outcomes compared to only integrating threshold concepts into an existing curriculum.

This research also presents evidence that sequencing a course around the threshold concepts, rather than the foundational concepts, has the potential to make difficult concepts easier for students, without changing their perceptions of the important concepts of economics.

By working through and applying the literature on threshold concepts in economics, we recommend the transformation of the entire entry-level economic curriculum via the integration of all the threshold concepts of economics into every learning and teaching activity of an economics curriculum.

Ongoing research in this project, on the '*The R.E.A.L. framework*' will also be useful to curriculum developers. The *R.E.A.L.* scaffolding mechanism in learning and teaching activities to integrate the threshold concepts of economics could prove to be a useful tool for both learners and teachers alike.

While our research project is focused on entry-level economics, further research is needed on transforming the economics curriculum in intermediate economics as well as capstone economics courses.

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The thesis



Concluding chapter

The research as presented and discussed in the previous chapters enables significant and original conclusions to be drawn in relation to the economics curriculum. Conclusions can be drawn in relation to threshold concepts as a theoretical framework for teaching, and learning taxonomies as a methodical approach for the design of teaching activities. Areas for further research are identified at the end of the chapter.

The contribution of this research is that it formulated both the transformation of an economics curriculum, as well as the integration of threshold concepts into an economics curriculum. The curriculum was transformed via the re-sequencing of content using threshold concepts. Furthermore, the curriculum has threshold concepts integrated into every activity with a purposeful scaffolding for learning and teaching economics.

I introduced four key innovations to the curriculum:

- integrating all the threshold concepts of economics that are relevant to an introductory microeconomics curriculum,
- re-sequencing the economics curriculum with an eye to the threshold concepts of economics – engaging students with the ‘*why*’ of learning economics.
- scaffolding the learning and teaching activities of the curriculum around an application of learning taxonomies according to the *R.E.A.L. framework* – equipping students with the ‘*how*’ of learning economics,
- utilising assessments *for* learning, rather than purely using assessments *of* learning,

Transformative learning and teaching in economics

I am a firm believer that the learning journey becomes a fruitful one for both teachers and students when the focus is on inspiring students to want to learn – by emphasising the ‘*why*’ of learning via the application of my research into the threshold concepts of economics and teaching sequences (Meyer and Land, 2003). As I also believe that teaching is about empowering students to navigate their own learning journey, I aim to equip students with the tools that they require – by focusing on the ‘*how*’ of learning via the application of my research into learning taxonomies and learning progressions (Anderson, Krathwohl, *et. al.*, 2001).

In Chapter 1 I showed that one way to integrate the ‘*why*’ and the ‘*how*’ of learning economics is to build an economics curriculum that focuses on the threshold concepts of economics. These concepts are the transformative and integrative concepts that are the lens of seeing the world through the eyes of each discipline (Meyer and Land, 2003). The threshold concept approach to curriculum design explicitly focuses on building a curriculum around the learning outcomes – the learning outputs. On the other hand, the foundational concept approach to curriculum design explicitly focuses on building a curriculum around building blocks – the learning inputs.

The foundational concept approach focuses on the accumulation of inputs and eventually, the student achieves the learning output of the course – to see the world through the eyes of an economist. The threshold concept approach implies a curriculum that explicitly incorporates the learning outputs of a course at the beginning, rather than leaving these outputs towards the end of the course. I showed that this is particularly important in a service economics course in a faculty of business, as most students will only ever complete one introductory course in economics – not the whole degree. Using the traditional approach, these students will never get to see the world through the lens of an economist as they will only be exposed to the initial ideas of economics.

To transform an economics curriculum, I re-sequenced the existing content, so that it would engage the learning outputs of threshold concepts. This re-sequencing required flipping the traditional sequence of topics in an economics curriculum – bringing the final topics to the beginning of the curriculum, and the initial topics to the end. With such a re-sequencing of the curriculum, learners are engaged with the learning outputs, i.e. the threshold concepts of a discipline, at the outset, and thus, learners are engaged in seeing the world through the eyes of an economist. Student interest is captured by initially focusing on the ‘*why*’ of learning economics. *After* students begin to see

the world through the eyes of an economist, learners can *then* be introduced to the inputs, i.e. the foundational concepts that are working behind the scenes.

I showed that introducing learners to the curriculum output at the outset, rather than the curriculum input, engages students in the discipline of economics. This is especially important because initial undergraduate economics courses in modern universities are mostly service courses that students are completing as part of a major in another discipline, which is predominantly a major in a faculty of business (Thornton, 2012). I showed that seeing economics in practice in the real world at the beginning of a curriculum, rather than the foundational building blocks of theory, promotes interest and engagement in economics – which enables a service course in economics to serve its intended purpose.

This research studied the transformation of a traditional economics curriculum by re-sequencing this content according to the threshold concepts of economics. The curriculum content and the subject learning outcomes were not changed, and I explored and showed that an explicit formulation of the curriculum around threshold concepts would improve student learning outcomes, as well as the student learning experience.

This research also integrated, into a single curriculum, the previous research of threshold concepts in economics curricula. Prior studies of threshold concepts in an economics curriculum addressed only a specific part of the curriculum, such as: quiz design, assignment design, and learning activities. I integrated threshold concepts into every aspect of the economics curriculum, including lectures, tutorials, assessments and feedback.

In Chapters 2 and 3 I explored the two arms of these innovations – the ‘*why*’ of learning and teaching economics in Chapter 2, and the ‘*how*’ of learning and teaching economics in Chapter 3.

Transforming the economics curriculum

In Chapter 2 I explored the literature on threshold concepts as well as that on curriculum re-design, which enabled me to re-sequence the traditional mainstream introductory microeconomics curriculum. This re-sequencing utilised the threshold concepts of economics to guide the sequencing of weekly topics while maintaining the traditional mainstream content of the curriculum. In this chapter, I extensively explained the economics pedagogy behind the re-sequencing of topics, and how this re-sequencing can engage students in the ‘*why*’ of learning economics. In this chapter, I also presented statistical tests on both the student learning experience and the learning outcomes. I found that there are significant improvements in both these metrics because of the innovations discussed across this thesis.

The discipline of economics, like other disciplines, is now catering to an ever-diversifying student cohort each decade (Cheah, Stokes and Wilson, 1999; Goebel, 2017). Economics graduates will also face a world with career and business opportunities that did not in fact exist during their time in university (Gale and Parker, 2013). Thus, it is important for graduates to have developed the essential skills needed to interact with diverse colleagues, as well as a diverse career landscape. Economics graduates may find that the content gained from their university education is either redundant or irrelevant in a dynamic world. Thus, they need to be equipped with concepts that have transformed their way of thinking. With these concepts in hand, graduates can then integrate these transferrable skills into their careers.

Threshold concepts are the transferrable concepts of economics because they are both transformative and integrative (Meyer and Land, 2003). While there are threshold concepts in economics, these are arguably not explicitly addressed in entry-level economics courses and these concepts do not guide the curriculum design. Traditionally, the content of economics guides the curriculum design, and hence the result is the homogeneity of courses across institutions and time. Thus, the threshold concepts in economics are arguably scattered throughout the various content modules and lecture topics, rather than guiding the curriculum design. Instead, they are presented to students in an implicit rather than an explicit sense. A disadvantage of this approach, as noted by Meyer and Land (2003), is that the targeted student cohort could potentially not be presented with an opportunity to grasp the threshold concept itself. Therefore, the students would find themselves unable to understand the theory and consequently unable to apply their knowledge in varying circumstances and scenarios.

In Chapter 2, I showed that transforming an entry-level economics curriculum by integrating threshold concepts allowed learners to better grasp these concepts of economics, and thus: (i) achieve a better student learning experience of the course, and (ii) achieve an improvement in the course's set learning outcomes. Beyond the course, learners should be able to apply these concepts to the dynamic world that they will graduate into. This dynamic world is one which the existing, content-based curriculum is unable to adequately prepare them for, as the content may in fact be, or eventually become, irrelevant.

I used the transformative, integrative and troublesome concepts, i.e. threshold concepts as a guide to the sequencing of content – which led to an improvement in both the student learning experience as well as the learning outcomes. Furthermore, by purposely sequencing content around the threshold concepts, all the learning and teaching activities in the course implicitly and explicitly worked towards inviting students to cross the liminal boundary and walk through the gateway of thinking like an economist, and thus achieve improved learning outcomes. I worked through the lecture content of the past offerings of the content of the course and re-structured the weekly curriculum schedule as shown in Table 1.

Table 1 – Curriculum re-sequence

Week	Traditional sequence of content	Transformed sequence of content
01	Introduction to Economics	Introduction to Economics and the PPF
02	PPF and Comparative Advantage	Market Structures – Producer Theory
03	Demand and Supply	Market Structures – Perfect Competition
04	Elasticity	Demand and Supply
05	Efficiency	Market Structures – Monopoly
06	Government Actions in Markets	Market Structures – Monopolistic Competition
	Two-week mid-semester break	Two-week mid-semester break
07	Externalities	Elasticity
08	Consumer Theory	Efficiency
09	Market Structures – Producer Theory	Externalities
10	Market Structures – Perfect Competition	Government Actions in Markets
11	Market Structures – Monopoly	Consumer Theory
12	Market Structures – Monopolistic Competition	Game Theory – Oligopoly
13	Game Theory – Oligopoly	Comparative Advantage

The main changes to the topic re-sequencing have been highlighted in Table 1. In the traditional topic sequencing, the foundational concepts of *elasticity*, *efficiency*, and *government actions in markets* were presented towards the beginning of the course. The students were then given a two-week break which involved a research-based assignment on these foundational concepts. After the break, the more difficult concept of *market structures* was laid on top of these foundational concepts. The threshold concept of *market structures* traditionally requires the foundational concepts of *elasticity*, *efficiency*, and *government actions in markets*, because the study of *market structures* involves the incorporation of these foundational concepts to see how the different markets in the economy work.

In the transformed topic sequencing, the threshold concept of *market structures* is moved to the first half of the semester, engaging the students in this more difficult concept, but allowing them to see how markets work and interact – a learning outcome of the course. During the two-week break, students were given a research-based assignment on this threshold concept of market structures and interactions. The assignment required students to find their own examples of the different market structures in the economy, and critically evaluate their findings based on the theory. This gave students the opportunity to see through the eyes of an economist, by seeing these markets at work in the contemporary world. Furthermore, the assignment gave students the opportunity to query the work that happens behind the scenes, that is, the foundational concepts of *elasticity*, *efficiency*, and *government actions in markets*. Once the semester re-convened, students were then introduced to the foundational concepts that were working behind the scenes of the threshold concept of *market structures*. I believe that this approach, of presenting the threshold concepts of economics at the outset, presents the learning outcomes of such a course as early as possible, and engages the student with seeing economics in their contemporary world so that they are inspired to learn the course's content, which includes the foundational concepts.

Making economics R.E.A.L.

Students learn best when they are inspired to learn – the ‘*why*’ about their learning (Becker, 2000). They also learn best when teachers acknowledge that learning itself is a journey that requires tools to navigate – equipping students with the ‘*how*’ of learning (Boud, 2000).

In Chapter 3, I discussed the literature on learner transitions to university as well as that on learning taxonomies, to create a four-step scaffolding that I term the *R.E.A.L. framework*. This scaffolding is created by integrating the work of Davies and Mangan (2008) into the revised Bloom's taxonomy (Anderson, Krathwohl, *et. al.*, 2001) to create four steps to navigate learners from base-level knowledge to higher level evaluative and critical thinking in economics. In this chapter I presented samples of a *R.E.A.L.* lecture, a *R.E.A.L.* tutorial, as well as a *R.E.A.L.* assignment – learning and teaching activities that equip students with the ‘*how*’ of learning economics.

With first-year undergraduate economics students, imparting the ‘*why*’ about learning is challenging as these students may have a limited experience of the world beyond schooling. The ‘*how*’ to learn university economics is also key. The importance of assisting the transition to university is well documented in the literature (Kift, *et. al.*, 2010; Wood and Breyer, 2017).

Embedding the ‘*why*’ and the ‘*how*’ into the curriculum can assist student transitions by enhancing their learning experience as well as their learning outcomes. While threshold concepts are useful in articulating the ‘*why*’ of learning economics, students receive a transformative learning experience when we equip them with tools concerning the ‘*how*’ of learning.

To create a curriculum that equips students with the tools required for their learning, I built upon the research of Davies and Mangan (2008). Davies and Mangan developed three types of activities: ‘reflective exercises’, ‘problem-focused exercises’ and ‘threshold-network exercises’. In my research, I incorporated the activity types of Davies and Mangan into a revision of Bloom’s Taxonomy (Anderson, Krathwohl, *et. al.*, 2001), to create a scaffolding for the learning and teaching of economics – the ‘*how*’ of learning economics. In Chapter 3, I discussed how I transformed the learning and teaching activities of my course’s curriculum to navigate students from base-level learning to higher level learning. To ensure that the curriculum is designed to transform the learner, every learning and teaching activity was constructed around the revised Bloom’s taxonomy.

Lectures, tutorials and the assignment were structured around the theme: *R.E.A.L.* Here, every activity in this course is broken into four parts, where each part gets progressively more challenging and involves higher-level thinking, progressively working through the revised Bloom’s Taxonomy in Figure 1 around the acronym, *R.E.A.L.*:

‘*R*’ – *Re-cap and Remind*, where students are to recall the concepts covered that week (or the previous week) – *Remember* in the revised Bloom’s taxonomy;

‘*E*’ – *Economics Everyday*, where students can engage with and relate to these concepts by connecting them to examples or scenarios that they experience every day – *Understand* in the revised Bloom’s taxonomy;

‘*A*’ – *Application and Awareness*, where students take their knowledge further by applying these concepts to a different, but a practical and contemporary scenario, thus providing an understanding of their learned expertise in a broader context – *Apply* and *Analyse* the revised Bloom’s taxonomy;

‘*L*’ – *Learning Life Lessons*, which is an evaluative exercise, encouraging informed critique, on a contemporary social issue, that builds on research-led, discipline-specific content – *Evaluate* and *Create* the revised Bloom’s taxonomy.

I showed that the *R.E.A.L. framework* systematically equipped the learner to progress to the highest level of learning according to the revised Bloom's taxonomy – *Evaluate* and *Create*. This structure also fosters a program-based curriculum. When students attempt the challenging material in '*Learning Life Lessons*', they are equipped with the '*how*' of tackling higher-level courses in their degree programs. With this scaffolding, students are thus equipped with generic work and life skills to apply to their work, career and entrepreneurial endeavours – the transformative and integrative features of threshold concepts. Thus, students engage themselves in the subject as the learning and teaching activities explicitly highlight and work towards the '*why*' of their learning.

The 'why' and the 'how' of learning and teaching economics

In Chapter 4 I disentangled the effects of the different curriculum innovations. A natural experiment resulted during the period of research where one semester of study ran with the traditional mainstream sequencing of topics; however, in this semester, I still incorporated the *R.E.A.L. framework* to integrate threshold concepts into the curriculum. In this chapter I compared and contrasted the results of the student learning experience and the learning outcomes compared to the other semesters during the period of study, which not only underwent the incorporation of the *R.E.A.L. framework* but also underwent a transformed sequencing of weekly topics. I found that in all instances there were improvements in the student learning experience and improvements in the students learning outcomes. However, the semesters that had both the re-sequencing of weekly topics as well as the application of the *R.E.A.L. framework* experienced greater improvements in both the learning experience and the learning outcomes. This indicates that the '*why*' and the '*how*' of learning and teaching economics go hand-in-hand to create an engaging economics curriculum, that equips learners with the threshold concepts of economics to empower them during their study, careers and beyond.

The natural experiment that resulted therefore assisted with controlling the impact of the re-sequencing of the content. One semester during this period, which I call *Semester A*, ran in the traditional sequence of topics, even though threshold concepts were integrated into the curriculum, especially by the *R.E.A.L. framework*. Whereas three of the semesters in the period of research – which I call *Semester X*, *Semester Y*, and *Semester Z* – ran in the transformed re-sequencing of topics, with threshold concepts integrated into the curriculum. Thus, while all four semesters during the research period involved the integration of threshold concepts into the curriculum, only three of the four semesters experienced a transformed curriculum sequencing. For comparison

purposes I use one semester before the study period, which I call *Semester N*. In *Semester N*, threshold concepts were neither integrated into the curriculum, nor was the curriculum re-sequenced for threshold concepts. Across all *Semesters N, X, Y, Z, and A*, the content covered was identical, the course convenor (co-ordinator) was identical, the lecturers were identical, and the team of tutors was similar. The integrity of the curriculum's content, the teaching activities, and the assessment was ensured by a rigorous moderation process, which exists within the economics department independent of this research. Nevertheless, each semester has a new cohort of students so whilst I controlled the variables as much as possible, there would have been some variation in the cohorts.

Thus, in Chapter 4, I applied and tested two alternative economic curriculum frameworks around threshold concepts – one that integrates threshold concepts into an existing economics curriculum, and one that goes further by transforming the curriculum through re-sequencing the content. I showed that the utilisation of threshold concepts in both curriculum frameworks does improve both the student learning experience as well as the learning outcomes. However, the transformation of the entire curriculum sequencing for threshold concepts had a greater impact on the student learning experience and the learning outcomes compared to only integrating threshold concepts into an existing curriculum.

Concluding thoughts on the thesis

I utilised four approaches to assist and engage a diverse cohort via a transformation of the curriculum around threshold concepts. This incorporated:

- integrating all the threshold concepts of economics that are relevant to an introductory microeconomics curriculum,
- re-sequencing the economics curriculum with an eye for the threshold concepts of economics – engaging students with the ‘*why*’ of learning economics,
- scaffolding the learning and teaching activities of the curriculum around an application of learning taxonomies according to my *R.E.A.L. framework* – equipping students with the ‘*how*’ of learning economics.
- utilising assessments *for* learning, rather than purely using assessments *of* learning,

The result was: (1) an improvement in the student learning experience indicated by the student surveys, as well as (2) an improvement in student learning outcomes indicated by the improved

grade distribution. The student survey results indicated that, compared to previous offerings, the new curriculum was more organised to promote student learning; offered face-to-face sessions that are more engaging; had assessments that were more effective in the development of student understanding; contributed more to the development of their graduate capabilities; and the course was more intellectually challenging.

Thus, the curriculum that was transformed by integrating threshold concepts was more engaging, while still maintaining the quality and rigour of the course's content. In summary, the curriculum transformation promoted an enhanced student experience and enhanced learning outcomes, by making economics relevant – engaging students with the '*why*' of learning economics, and equipping students with the '*how*' of learning economics.

Further research

This research project is focused on entry-level economics. Thus, further research is needed on transforming the economics curriculum in intermediate economics courses, as well as within capstone economics courses. Future research needs to explore how the incorporation of threshold concepts, the re-sequencing of topics, utilising assessments for learning, and the use of the *R.E.A.L. framework* can improve the student learning experience and student learning outcomes in intermediate economics courses, as well as capstone economics courses.

This thesis sits within a larger research project and ongoing research is examining the student voice. In this regard, the survey that examined the student voice in the entry-level course is being conducted in the final-year capstone economics courses as well, asking students what they perceive to be the threshold concepts of economics; that is, asking students what they feel are the most difficult concepts to learn. This forthcoming research will provide further feedback into this curriculum transformation of the entire degree program by integrating threshold concepts.

Beyond the course, the curriculum re-design should also develop enhanced graduate capabilities. Addressing and assessing the post-course graduate capabilities is beyond the scope of this thesis and will be dealt with in ongoing research of the larger project.

Impact of my research – I

My research into the theory and the application of the aforementioned teaching pedagogies have been published in the highly-ranked journal, *Education + Training* – Karunaratne, P. S. M., Breyer, Y. A., and Wood, L. N. (2016). Transforming the economics curriculum by integrating threshold concepts. *Education+ Training*, 58(5), 492-509. Currently this paper has approximately 5,250 downloads, 10 citations, and it was the 7th most read paper of this journal in 2016. Of these 10 citations, 6 of the works that cite my research are outside of the discipline of economics – thereby proving that my research is applicable and practical beyond economics learning and teaching. This published work is presented here as Chapter 2 of this thesis. Chapter 2 has also been presented at *The Australian Conference of Economists (ACE 2016)*, as well as at *The Australasian Teaching Economics Conference (ATEC 2016)*. At *ATEC 2016*, I was acknowledged as having presented the best paper, thus rewarding excellence in my teaching and my research.

As outlined at the beginning of each chapter, the other chapters in this thesis have been presented at *ACE 2018*, at *ATEC 2017* – where I presented four papers; and at *ATEC 2018* – where I presented two papers. In 2018 I presented at the inaugural pathways-to-university conference jointly organised by the *International Education Association of Australia* and *English Australia*. The conference was titled *Pathways PD²*, and I presented at both the Melbourne and Sydney conferences, sharing my pedagogy, resources and activities with lecturers across disciplines from around Australia.

Recognition of my scholarship in the field of learning and teaching in economics is exhibited by my invitation to review a paper that was submitted to the journal: *The International Review of Economics Education*.

Impact of my research – II

At my home institution, Macquarie University, I have presented the innovations from my thesis to equip and empower teachers across all disciplines by running training workshops for teachers across the university: *Transformative teaching via the 'why' and the 'how' of learning* (2017), *Making your teaching R.E.A.L.* (2017), *The connected classroom – connected experiences, connected curriculum, connected people* (2018), and *The connected classroom – where everyone says wow* (2018). The main innovations from my thesis that are presented in these teacher training workshops are the curriculum re-design based on threshold concepts and the curriculum scaffolding based on the *R.E.A.L. framework*.

The *R.E.A.L. framework* can be utilised across disciplines by re-imagining the second step in the scaffold – *Economics Everyday* – as *Engaging Everyday Examples*. This would retain the acronym *R.E.A.L.*, but more importantly achieve the same motivation for the second step in the scaffold. *Engaging Everyday Examples* connect students' personal experiences with the curriculum to help them understand the content, while requiring the same level of cognition that is required in the second step of the *R.E.A.L. framework* that is outlined in my study.

Impact of my research – III

Beyond Australia, in 2018 I have been invited to present the innovations from my thesis to engage and equip teachers and lecturers overseas. I was invited by the international education specialist firm, *PacAsia*, where I presented the work from my thesis to train teachers and lecturers in Kathmandu, Nepal, (Thesis Appendix D) where the workshop was titled: *Teachers' Training: Transformative Learning and Teaching – Why, What, How and For Whom?* In 2018, I was also invited by the *Australian Trade and Investment Commission (AusTrade)* to present this teacher training workshop based on my thesis, in Dhaka, Bangladesh, (Thesis Appendix E). At both these workshops I was honoured to engage and equip teachers and lecturers with the proven teaching tools and practices that are discussed in the chapters of my thesis, thereby fostering – *A Connected Learning Community*.

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Thesis Appendix A

A sample *Unit Guide*, which is the document that outlines the entire course, ECON111.



ECON111

Microeconomic Principles

S1 Day 2016

Dept of Economics

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General Information

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ALL DISRUPTIONS TO STUDIES ENQUIRIES

Monday - Friday - 9:00 a.m. to 5:00 p.m.

BESS

ALL NON-ECON111 UNIVERSITY RELATED ENQUIRIES

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Contact via .

Credit points

3

Prerequisites

Corequisites

Co-badged status

Unit description

This unit provides an introduction to the main ideas and concepts involved in modern economics, and attempts to provide students with an understanding of how the economy works, what type of problems economists attempt to solve, and how they set about trying to solve them. The unit is primarily concerned with the analysis of individual decision-making units, and the behaviour of firms and industries in the economy, i.e. with microeconomics. Topics include: consumer choice and demand analysis; the firm and its production and costs; market structures from perfect competition to monopoly; welfare economics; and market failure and microeconomic reform.

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at <https://students.mq.edu.au/important-dates>

Learning Outcomes

1. Recognise the threshold concepts of economics.
2. Recall the principles of microeconomics.
3. Explain observed behaviour using microeconomic theory.
4. Apply microeconomic theory to aid in decision-making.
5. Differentiate contemporary market structures based on microeconomic theory.
6. Review contemporary social issues and policies using microeconomic tools.

General Assessment Information

Disruptions to Study (DTS)

Weekly Online Quizzes and Feedback - as we count the best 4 quizzes from a possible 12 quizzes, there is no need to submit a DTS if you miss a quiz.

Weekly Tutorial Work and Feedback - as we count the best 8 home-works from a possible 12 home-works, there is no need to submit a DTS if you miss a tutorial.

Assignment - THREE submissions

- If you are unable to make the first submission of the assignment on time (due to a valid reason), you may submit a DTS. If your case is approved, the Unit Convenor will give you an appropriate extension. Assignments that are late without an approved DTS application will incur a penalty of 12.5% per 24 hour period. Late assignments need to be handed in to BESS (E4B 106)
- If you are unable to make the second and/or third re-submissions of the assignment (due to a

valid reason), you may submit a DTS. If your case is approved, the Unit Convenor will organise a time where all students will be allocated to sit for the re-submissions. No further extensions will be provided.

Final Examination

- If you are unable to sit for the final examination (due to a valid reason), you may submit a DTS. If your case is approved, the university will organise a supplementary examination for you.

Assessment Tasks

Name	Weighting	Due
<u>Weekly Online Quiz & Feedback</u>	10%	Weekly from Week 3
<u>Weekly Tute Work & Feedback</u>	10%	Weekly from Week 2
<u>Assignment - THREE submissions</u>	30%	Wk 7 & Wk 8 & Wk 9 Tutorials
<u>Final Examination</u>	50%	University Examination Period

Weekly Online Quiz & Feedback

Due: **Weekly from Week 3**

Weighting: **10%**

There will be an online quiz conducted weekly throughout the session from Week 3 on iLearn. This assessment task is intended to give you ongoing feedback on your progress in the unit. Online quizzes will consist of multiple choice questions only. As some of these quizzes are before the census date, you will get immediate feedback for your decision to drop or continue in the unit.

From Week 3 and onwards, quizzes will be released weekly at 1 a.m. on Monday of each week and closed at 11:59 p.m. on the following Sunday.

Together the online quizzes will contribute 10% to your final mark in this unit. The best 4 out of all released quizzes will count towards your online quiz mark. Quizzes will be released every week from Week 3 to Week 14.

The purpose of the quizzes is to check your understanding of the unit material on a regular basis. While only the best 4 attempts count, you are STRONGLY recommended to attempt as many quizzes as possible to check on your ongoing progress in the unit, as well as to receive immediate feedback.

Please note that no extensions will be granted. Failure to complete any quiz will result in a zero mark for that quiz. As only the best 4 quizzes will be counted, you need not apply for special consideration via the Disruptions to Study Policy unless you have a serious misadventure that prevents you from attempting at least 4 quizzes. Students are advised not to apply for Disruptions to Study for missing a quiz, as only the best 4 quizzes will be counted.

If students undertake a quiz off-campus, it is their responsibility to ensure the compatibility of the software they use with that of the university. Technical failures that occur when the quizzes are done off-campus cannot be verified by the university and would usually result in the student receiving zero for that quiz.

The university computing labs are available throughout the weekend and have lab demonstrators to assist with technical issues.

If you have a valid reason that prevents you from attempting at least 4 quizzes throughout the session please consult BESS for advice on the Disruptions to Studies Policy.

This Assessment Task relates to the following Learning Outcomes:

- Recognise the threshold concepts of economics.
- Recall the principles of microeconomics.
- Explain observed behaviour using microeconomic theory.

Weekly Tute Work & Feedback

Due: **Weekly from Week 2**

Weighting: **10%**

Tutorial home-work submission will comprise 5% and participation within the tutorial via questions and answers will make up the remaining 5%. Each week, students will be required to submit one-quarter of their tutorial questions as home-work. A tutorial will generally consist of four questions, thus, one designated question each week will require submission. Submission details will be explained in your first tutorial as well as via iLearn.

The purpose of the home-work submission is to give you an incentive to attempt some of the questions prior to the tutorial in order to gain maximum benefit from the tutorial discussions.

A separate document with detailed instructions about the tutorial format and assessment will be made available on the unit web page. Your tutor/s will also outline tutorial requirements to you in your first tutorial.

The emphasis in marking the tutorial participation will be on how well you prepare for class. You will be placed in groups by your tutor to assist you with tutorial preparation. Your participation in the tutorials will allow you to practise how to apply economic theory to solve problems, to communicate your ideas to others and thereby to improve the confidence with which you undertake future economic studies.

You are expected to attend all tutorials.

However, we recognise that you may miss a couple due to other commitments. In this regard, failure to attend at least 8 tutorials and make 8 home-work submissions will be regarded as unsatisfactory and this will negatively impact on your tutorial mark.

If you miss more than 4 tutorials due to an unavoidable disruption/s, you may apply for special consideration (see the Disruption to Studies Policy below). If that application is approved the

attendance and home-work submission requirement will be waived for that tutorial.

Please consult BESS for advice on the Disruptions to Studies Policy.

This Assessment Task relates to the following Learning Outcomes:

- Recognise the threshold concepts of economics.
- Recall the principles of microeconomics.
- Explain observed behaviour using microeconomic theory.
- Apply microeconomic theory to aid in decision-making.
- Differentiate contemporary market structures based on microeconomic theory.
- Review contemporary social issues and policies using microeconomic tools.

Assignment - THREE submissions

Due: **Wk 7 & Wk 8 & Wk 9 Tutorials**

Weighting: **30%**

The assignment will comprise of 8 questions. **For the first of the three submissions** - students will hand in answers to all 8 questions **during their designated tutorial in Week 07. The document that you hand in Week 07 will be the typed and hand-drawn answers that you have prepared at home.**

NOTE: If a Public Holiday falls on any of the dates for your submissions - please check the 'Assessments' folder on iLearn for the submission details.

Detailed instructions for submission will be available on iLearn. Late assignments that have not followed the Disruptions to Studies Policy will incur a penalty of 12.5% per 24 hours. **The physical submission of the assignment in Week 07 will not be the end of the assignment submission. This is because THREE submissions of the assignment are required. The second two submissions are explained below and detailed on iLearn.**

In your tutorials in Week 08 and Week 09, two questions (each) will be randomly selected from these eight questions and you will be required to re-submit the answer to these during these tutorials. You will not have access to any resources during the tutorials of Week 08 and Week 09. You will need to answer the given questions on the day in writing within 40 minutes. You will be given two of these eight questions in Week 08. You will be given another two of these eight questions in Week 09. This is to ensure that the intended learning outcomes have been achieved via the assignment. These submissions will be given under MQ University test conditions.

If you miss your tutorial in Week 08 or Week 09, thus missing the 2nd and/or 3rd submissions of the assignment, you will receive a zero for the question required to be submitted in that tutorial. If you have a valid reason for special consideration you must apply for Disruptions to Study via BESS. If your application for Disruptions to Study is successful, you will be advised of an alternate method of submission for the 2nd and/or 3rd submissions of the assignment.

The documents that will be marked will be:

- the assignment questions answered in the Week 08 tutorial,
- the assignment questions answered in the Week 09 tutorial,
- the other four assignment questions that were handed in Week 07.

Thus, in total all 8 questions will be marked. All 8 marked questions will be weighted EQUALLY.

The purpose of the assignment is to give you the opportunity to demonstrate your knowledge of basic economic concepts, the economic way of thinking and to use this knowledge to solve economic problems.

The purpose of the repeat submissions is to ensure that you indeed have attained the learning outcomes of the unit.

All students who apply for special consideration (see the Disruption to Studies Policy below) in relation to the assignment will be given an extension for their submission in discussion with the Unit Convenor.

Please consult BESS for advice on the Disruptions to Studies Policy.

This Assessment Task relates to the following Learning Outcomes:

- Recognise the threshold concepts of economics.
- Recall the principles of microeconomics.
- Explain observed behaviour using microeconomic theory.
- Apply microeconomic theory to aid in decision-making.
- Differentiate contemporary market structures based on microeconomic theory.
- Review contemporary social issues and policies using microeconomic tools.

Final Examination

Due: **University Examination Period**

Weighting: **50%**

End of unit three hour written examination, to be taken during the end of session examination period.

The examination will cover material drawn from all parts of the unit's subject matter.

The exam will consist of multiple choice questions and written-answer questions.

The purpose of the final exam is to give you the opportunity to demonstrate your knowledge of basic economic concepts, the economic way of thinking and to use this knowledge to solve economic problems.

All students who apply for special consideration (see the Disruption to Studies Policy below) in relation to the final exam will be required to sit a supplementary examination, if the special consideration application is approved. Please note that the supplementary examination, held during the university supplementary exam period, may have a different format to the original

exam. It is reasonable to point out that because students who sit the supplementary examination usually have much longer to prepare for their examination, the supplementary examination will be more difficult and marked at a higher level than the original examination.

Please consult BESS for advice on the Disruptions to Studies Policy.

This Assessment Task relates to the following Learning Outcomes:

- Recognise the threshold concepts of economics.
- Recall the principles of microeconomics.
- Explain observed behaviour using microeconomic theory.
- Apply microeconomic theory to aid in decision-making.
- Differentiate contemporary market structures based on microeconomic theory.
- Review contemporary social issues and policies using microeconomic tools.

Delivery and Resources

Required and Recommended Texts and/or Materials

The required textbook in ECON111 is one of the following (in alphabetical order):

- McEachern, W., *Microeconomics: A Contemporary Introduction*, Cengage Learning
- Parkin, M., *Microeconomics: Australia in the Global Economy*, Pearson
- Stiglitz, J., *Introductory Microeconomics: Australian Edition*, Wiley

The Co-op bookstore has these books and it is recommended that students purchase a copy of one of these. A copy of these books has been placed in the reserve section of the library. The publisher provides a range of support material for the textbook, including a website.

Information on accessing this material is provided in the introduction to the text. The website material includes trial questions and quizzes. You may find it useful to devote some limited time to these questions and quizzes. They will give you some feedback on how your understanding is progressing. Note however that the bulk of your study time, outside of the classroom, should be devoted to studying

Additional References

Your recommended textbook will be more than adequate for this unit. Listed below are a series of other texts on microeconomics that you should feel free to consult if you wish. These books cover most of the material covered in your textbook, but each one does so in its own unique way. You may choose to consult these books if you feel that a slightly different presentation of the material might aid your understanding. These books have been placed in the reserve section of the library:

Gans, J., King, S., & Mankiw, N. G. *Principles of Microeconomics: Australia and New Zealand Edition*, Cengage Learning

McTaggart, Findlay and Parkin, *Principles of Microeconomics*, Pearson Education, Australia.

Technology Used and Required

Unit Web Page The unit uses the learning management system (iLearn) that can be accessed via iLearn.mq.edu.au. The lecture slides for each week's lecture will be posted on the unit web page, before the lecture. You will find it useful to download the slides prior to the lecture, and bring them to the lecture. The web page is also used to post important notices from time to time. You should check this web page regularly. The unit web page has the facility to allow peer to peer discussion. The unit web page also allows students to put questions to an Online-Tutor. The Online-Tutor will attempt to answer your questions in a timely manner.

Learning and Teaching Activities

This unit is taught as a mix of tutorials and lectures. The lectures are designed to provide the tools which can then be applied in tutorials.

Lectures – large group learning (2 hours for each topic)

Lectures are intended to provide an overview of the key concepts explored in the unit. Students are expected to read the relevant chapters before each lecture. Independent learning ECON111 relies heavily on independent learning where students read the relevant chapter, revise lecture notes and prepare answers to the tutorial questions.

Tutorials – small group learning (1 hour for each topic)

Tutorials constitute a critical learning experience of this unit and students must attend. Group work is an essential part of this learning. In ECON111 we emphasise peer-to-peer learning by working as a group through the exercises and learning from others. Your tutor's role is to help you understand the material. Ask your tutor for guidance on how to approach questions and problems.

After the tutorials – the learning continues. At the end of each teaching day, review your tutorial notes, compare your answers to those of friends, members of your group and the discussion board. Note that model answers will not be provided. You get the answers by engaging in all the above activities.

PAL, Peer Assisted Learning (1 hour for each topic)

Revision of the material from both lectures and tutorials.

Unit Schedule

The curriculum has been transformed by integrating the threshold concepts of economics. Each topic will revolve around the threshold concepts of economics. Students are not to consider the

unit as a series of 13 topics of content. Rather, students will be trained to master the eight threshold concepts of economics. The Topic Content each week is simply to highlight the utilisation of one or more of the eight Threshold Concepts of economics. While each topic engages more than one threshold concept, the main threshold concept for each topic has been **underlined in bold**. The corresponding chapter readings will be provided on iLearn.

Topic #	Topic Content covered *	Threshold Concepts engaged		
1	Production Possibilities Frontier	<u>Economic Models</u> Opportunity Cost Marginal Analysis		
2	Producer Theory	Economic Models Opportunity Cost <u>Marginal Analysis</u>		
3	Perfect Competition	Economic Models <u>Opportunity Cost</u> Marginal Analysis Markets - Interactions & Structures		
4	Demand & Supply	Economic Models Opportunity Cost Marginal Analysis <u>Equilibrium & Disequilibrium</u>		
5	Monopoly	Economic Models <u>Markets - Interactions & Structures</u> Welfare & Efficiency		
6	Monopolistic Competition	Markets - Interactions & Structures Welfare & Efficiency <u>Elasticity</u>		
7	Elasticity	Equilibrium & Disequilibrium Markets - Interactions & Structures <u>Elasticity</u>		
8	Efficiency	<u>Marginal Analysis</u> Welfare & Efficiency Equilibrium & Disequilibrium		

Topic #	Topic Content covered *	Threshold Concepts engaged		
9	Externalities	Marginal Analysis <u>Welfare & Efficiency</u> Equilibrium & Disequilibrium		
10	Govt. Actions in Markets	Marginal Analysis <u>Welfare & Efficiency</u> Equilibrium & Disequilibrium		
11	Consumer Theory	<u>Economic Models</u> Opportunity Cost <u>Marginal Analysis</u>		
12	Game Theory / Oligopoly	<u>Economic Models</u> Markets - Interactions & Structures .		
13	Trade	Opportunity Cost <u>Comparative Advantage</u> .		

*** The Unit Schedule is subject to change depending on the lecture pace. Any alterations will be advised via iLearn.**

While the coverage of each lecture stream is identical, students are encouraged to attend a single lecture stream for the entire session. This is to ensure continuity of a train of thought within a lecture stream. **It is expected that students will be attending lectures on a weekly basis.** The lecture streams are advertised on iLearn. Students are free to attend any lecture stream, regardless of their official enrolment in e-Student.

Learning and Teaching Activities

Lectures - large group learning (2 hours for each teaching topic)

Lectures are intended to provide an overview of the key concepts explored in the unit. Students are expected to read the relevant chapters before each lecture.

Independent learning

ECON111 relies heavily on independent learning where students read the relevant chapter,

revise the lecture notes and prepare answers to the pre-set tutorial questions.

Tutorials - small group learning (1 hour for each teaching topic)

Tutorials constitute a critical learning experience of this unit and students must attend them. Group work is an essential part of this learning. In Econ111, we emphasise peer-to-peer learning by working as a group through the exercises and learning from others (the tutor and fellow students). Participation in question and answer (Q&A) in class will allow you to not only learn, but develop the ability to communicate what you have learnt to others. This will in turn reinforce your learning. Your tutor's role is to help you understand the topics by showing how tools learnt in lectures are applied in the tutorial. Your tutor should be your first point of contact if you encounter any difficulties with the course material or tutorial exercises. Ask your tutor for guidance on how to approach questions/difficulties.

After the tutorials - the learning continues

At the end of each teaching day, review your tutorial notes, compare your answers to those of your peers / group and consult the discussion board for further postings on the topic. NOTE: Model answers to tutorial questions WILL NOT be provided. You are required to attend your allocated class to receive feedback and answers, as well as to participate in class discussions.

PAL - Peer Assisted Learning (1 hour for each teaching topic)

Revision of the material covered in lectures and tutorials.

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Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central](#). Students should be aware of the following policies in particular with regard to Learning and Teaching:

Academic Honesty Policy http://mq.edu.au/policy/docs/academic_honesty/policy.html

New Assessment Policy in effect from Session 2 2016 http://mq.edu.au/policy/docs/assessment/policy_2016.html. For more information visit http://students.mq.edu.au/events/2016/07/19/new_assessment_policy_in_place_from_session_2/

Assessment Policy prior to Session 2 2016 <http://mq.edu.au/policy/docs/assessment/policy.html>

Grading Policy prior to Session 2 2016 <http://mq.edu.au/policy/docs/grading/policy.html>

Grade Appeal Policy <http://mq.edu.au/policy/docs/gradeappeal/policy.html>

Complaint Management Procedure for Students and Members of the Public http://www.mq.edu.au/policy/docs/complaint_management/procedure.html

Disruption to Studies Policy http://www.mq.edu.au/policy/docs/disruption_studies/policy.html *The Disruption to Studies Policy is effective from March 3 2014 and replaces the Special Consideration Policy.*

In addition, a number of other policies can be found in the [Learning and Teaching Category](#) of Policy Central.

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: https://students.mq.edu.au/support/student_conduct/

Results

Results shown in *iLearn*, or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in [eStudent](#). For more information visit ask.mq.edu.au.

Academic Honesty

The nature of scholarly endeavour, dependent as it is on the work of others, binds all members of the University community to abide by the principles of academic honesty. Its fundamental principle is that all staff and students act with integrity in the creation, development, application and use of ideas and information. This means that:

- all academic work claimed as original is the work of the author making the claim
- all academic collaborations are acknowledged
- academic work is not falsified in any way
- when the ideas of others are used, these ideas are acknowledged appropriately.

Further information on the academic honesty can be found in the Macquarie University Academic Honesty Policy at http://www.mq.edu.au/policy/docs/academic_honesty/policy.html

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Grades

Macquarie University uses the following grades in coursework units of study:

- HD - High Distinction
- D - Distinction
- CR - Credit
- P - Pass
- F - Fail

Grade descriptors and other information concerning grading are contained in the Macquarie University Grading Policy which is available at:

<http://www.mq.edu.au/policy/docs/grading/policy.html>

Grading Appeals and Final Examination Script Viewing

If, at the conclusion of the unit, you have performed below expectations, and are considering lodging an appeal of grade and/or viewing your final exam script please refer to the following website which provides information about these processes and the cut off dates in the first instance. Please read the instructions provided concerning what constitutes a valid grounds for appeal before appealing your grade.

http://www.businessandconomics.mq.edu.au/new_and_current_students/undergraduate_current_students/how_do_i/grade_appeals/

Student Support

Macquarie University provides a range of support services for students. For details, visit <http://students.mq.edu.au/support/>

Learning Skills

Learning Skills (mq.edu.au/learningskills) provides academic writing resources and study strategies to improve your marks and take control of your study.

- [Workshops](#)
- [StudyWise](#)
- [Academic Integrity Module for Students](#)
- [Ask a Learning Adviser](#)

Student Enquiry Service

For all student enquiries, visit Student Connect at ask.mq.edu.au

Equity Support

Students with a disability are encouraged to contact the [Disability Service](#) who can provide appropriate help with any issues that arise during their studies.

IT Help

For help with University computer systems and technology, visit http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/.

When using the University's IT, you must adhere to the [Acceptable Use of IT Resources Policy](#). The policy applies to all who connect to the MQ network including students.

Graduate Capabilities

Discipline Specific Knowledge and Skills

Our graduates will take with them the intellectual development, depth and breadth of knowledge, scholarly understanding, and specific subject content in their chosen fields to make them competent and confident in their subject or profession. They will be able to demonstrate, where relevant, professional technical competence and meet professional standards. They will be able to articulate the structure of knowledge of their discipline, be able to adapt discipline-specific knowledge to novel situations, and be able to contribute from their discipline to inter-disciplinary solutions to problems.

This graduate capability is supported by:

Learning outcomes

- Recognise the threshold concepts of economics.
- Recall the principles of microeconomics.
- Explain observed behaviour using microeconomic theory.
- Apply microeconomic theory to aid in decision-making.
- Differentiate contemporary market structures based on microeconomic theory.
- Review contemporary social issues and policies using microeconomic tools.

Assessment tasks

- Weekly Online Quiz & Feedback
- Weekly Tute Work & Feedback
- Assignment - THREE submissions
- Final Examination

Critical, Analytical and Integrative Thinking

We want our graduates to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments; to be able to critique constraints, assumptions and limitations; to be able to think independently and systemically in relation to scholarly activity, in the workplace, and in the world. We want them to have a level of scientific and information technology literacy.

This graduate capability is supported by:

Learning outcomes

- Explain observed behaviour using microeconomic theory.
- Apply microeconomic theory to aid in decision-making.
- Differentiate contemporary market structures based on microeconomic theory.
- Review contemporary social issues and policies using microeconomic tools.

Assessment tasks

- Weekly Online Quiz & Feedback
- Weekly Tute Work & Feedback
- Assignment - THREE submissions
- Final Examination

Problem Solving and Research Capability

Our graduates should be capable of researching; of analysing, and interpreting and assessing data and information in various forms; of drawing connections across fields of knowledge; and they should be able to relate their knowledge to complex situations at work or in the world, in order to diagnose and solve problems. We want them to have the confidence to take the initiative in doing so, within an awareness of their own limitations.

This graduate capability is supported by:

Learning outcomes

- Apply microeconomic theory to aid in decision-making.
- Differentiate contemporary market structures based on microeconomic theory.
- Review contemporary social issues and policies using microeconomic tools.

Assessment tasks

- Weekly Tute Work & Feedback
- Assignment - THREE submissions
- Final Examination

Effective Communication

We want to develop in our students the ability to communicate and convey their views in forms effective with different audiences. We want our graduates to take with them the capability to read, listen, question, gather and evaluate information resources in a variety of formats, assess, write clearly, speak effectively, and to use visual communication and communication technologies as appropriate.

This graduate capability is supported by:

Learning outcome

- Review contemporary social issues and policies using microeconomic tools.

Assessment tasks

- Weekly Tute Work & Feedback
- Assignment - THREE submissions
- Final Examination

Changes from Previous Offering

The final examination has been reduced from 60% in 2014 to 50% in 2015 and 2016.

The assignment is now worth 30% in 2015 and 2016 instead of 20% in 2014.

The ordering of the topics has been augmented in line with the literature on "Threshold Concepts". This new curriculum was first implemented successfully in Session 3, 2014.

Lecture Streams

While the coverage of each lecture stream is identical, students are encouraged to attend a single lecture stream for the entire session. This is to ensure continuity of a train of thought within a lecture stream. **It is expected that students will be attending lectures on a weekly basis. You are free to attend any lecture stream, regardless of your official enrolment in e-Student.**

In addition to the aforementioned on-site lecture streams, a live lecture stream will be available (see iLearn for the timetable).

If you are unable to attend an on-site lecture for a particular week, you are encouraged to log on to the live iLecture stream via iLearn from your chosen location. You will be able to interact with the teaching staff live via a chat tool in the live video-streaming-software (instructions on iLearn). The lecturer of this stream, (the Unit Convenor, Prashan Karunaratne) will **aim to** address any issues or questions during the 2 hour time slot - **depending on practicality**. Otherwise, the queries may be attended to post-lecture via iLearn. The purpose of the live lecture stream is to allow interaction between students and teaching staff, even if students choose to attend the lecture on-line for a particular week.

Furthermore, experience and feedback from past years indicate that students who miss an on-site lecture, and thus decide to watch pre-recorded lectures end up delaying the viewing of these. Students have reported that they themselves create a negative situation having accumulated too many hours of pre-recorded lectures to be viewed - and thus feel overwhelmed. Experience and feedback from students also indicates that watching a pre-recorded 2 hour lecture actually ends up taking 3 or more hours - due to continuous pausing and re-playing - thus ending up taking more time than originally intended or envisaged. The live iLecture stream intends to address the negatives of pre-recorded lectures. However, the live iLecture is not intended to be a substitute to attending the on-site lecture in the first place.

NOTE: If you opt for the live iLecture stream, ECON111 staff are NOT able to address any technical, software or internet issues. By opting out of an on-site lecture and choosing the on-line live iLecture, you are responsible for ensuring all required compatibilities of hardware and

software.

In addition to the aforementioned live iLecture stream, all on-site streams will be recorded and available for review for study and revision purposes via Echo360 on iLearn.

It must be noted that, the university and the The Tertiary Education Quality Standards Agency (TEQSA), has listed the unit as "internal". Therefore, the expectation from staff, the university and TEQSA is that you are physically attending classes on-site. Innovations such as iLecture and Echo360 are provided as a supplement to assist in your study experience and journey at Macquarie University. These innovations are not intended as a substitute. This is because the unit is not listed as "external" - in other words, it is not a component of an online degree. The fees you pay, either deferred fees or upfront fees, are reflective of the extra resources and facilities required for an internal offering of the unit.

Furthermore, you will miss out on the "full" university experience by not being on-site, physically interacting with staff, physically interacting with peers and practising real-world social skills and collegiality that a university campus provides as training for your future careers.

It must be further noted that, the lectures in ECON111 are very dynamic and not static. The lecture recordings - whether via iLecture, or via Echo360 simply capture the audio of the lecturer's voice and the video of the projections on the main theatre screen. The video recordings are unable to record the various classroom interactivities, demonstrations and experiments. This is because the video recordings simply capture what has been projected onto the main theatre screen. Furthermore, theatres at Macquarie University have multiple screens which at times the lecturers will utilise to display various content. In this instance again, the video recording is only able to capture the content on a single (the main) screen.

Finally, whichever lecture stream you choose, if you take part in all learning and teaching activities on a regular basis - you will be setting up yourself to not only pass but excel in ECON111 !

PLEASE REMEMBER THAT ALL STAFF INVOLVED IN ECON111 ARE HERE TO FORWARD AND NOT HINDER YOUR LEARNING.

WE ARE ALWAYS AVAILABLE AND READY TO ASSIST YOU IN ALL MATTERS RELATED TO ECON111. PLEASE COME AND SAY, " Hi !" .

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Research & Practice, Global contexts & Sustainability

Research & Practice

The curriculum design is based on the research of threshold concepts of Meyer & Land (2003, 2005, 2006 and continuing). The assessment design is one 'for learning' rather than that of solely 'of learning,' based on the research of Boud (2000 and continuing). The research has been presented, discussed and feedback incorporated from the broader university through presentations of research papers in the university's Learning & Teaching Week's of 2014 and 2015. The application of this cutting-edge pedagogy has been submitted to the Pro-Vice Chancellor of Learning & Teaching - Prof. Sherman Young who has commended both the application of the pedagogical research into threshold concepts as well as the pedagogical research into assessments for learning. Students have been invited to these research presentations at the university.

Approximately 50% of the tutorial questions each week revolve around contemporary research that is relevant to the student learning experience. This includes research and practice into the in/efficiencies of taxes, research and practice into solutions for climate change as well as research and practice about government de-regulation of public assets. Students are encouraged to refer to government websites such as the Australian Taxation Office, the Productivity Commission and the Australian Competition and Consumer Commission to access such contemporary research.

The assignment has a 25% weighting of research-based questions, where students have to research a designated market structure themselves, and apply their knowledge based on their research into this market structure.

The final exam has a 40% weighting of research-based questions, where students are again designated certain case studies which they have to research themselves, and apply their knowledge to be able to tackle the final exam questions.

Global contexts

There is a designated week to discuss comparative advantage, the economic rationale for trade - including the arguments for and against trade, and allowing the student to make their own informed decision. Through this topic, the students are invited to ECON110 - Macroeconomic Principles, to give them a further chance to explore the global context of economics.

The examples in lectures, tutorials and the assignment are not necessarily Australian, and includes (but is not limited to) class discussions of OPEC, the EU, ASEAN, the USA and Australia's three recent Free Trade Agreements (China, South Korea and Japan).

Sustainability

There is a designated week devoted to the study of efficiency - where students are exposed to

the measurement mechanisms of whether society is efficiently allocating its resources.

Furthermore, there is a designated week devoted to the study of market failures - where students are exposed to the research and policies of addressing instances where the market fails to allocate resources efficiently.

Throughout the entire unit, students are encouraged to engage the economics threshold concepts of Welfare and Efficiency when analysing any economic problem or scenario. As would be the case for any microeconomics unit, students are trained to be aware of the efficient allocation of scarce resources. Furthermore, with contemporary research, as well as domestic and global fora, students are made aware of the debates and the policy options available to efficiently allocate scarce resources.

Changes since First Published

Date	Description
24/02/2016	.
24/02/2016	Names of teaching staff have been updated due to re-allocation of lecture streams.
18/02/2016	Section added: 'Research & Practice, Global contexts & Sustainability'

Thesis Appendix B

The survey questions as well as average results are presented for a sample semester.



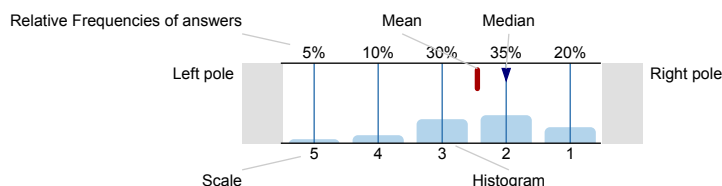
Learning and Teaching Centre
TEACHING EVALUATION FOR DEVELOPMENT SERVICE
MACQUARIE UNIVERSITY

Learner Experience of Unit/Teaching
Mr. Prashan Karunaratne, Economics
ECON111-Microeconomic Principles, ECON111-Microeconomic Principles
(ECON11115S21)
Co-lecturer/Convenor:
No. of responses = 641: Percentage of class/unit responding = 52.5%

Survey Results

Legend

Question text



n=No. of responses
av.=Mean
md=Median
dev.=Std. Dev.
ab.=Abstention

0300 Demographics

I am



In my program of study, this unit is



My first language is

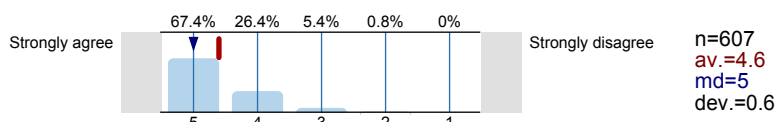


I am an



0121 LEU Core

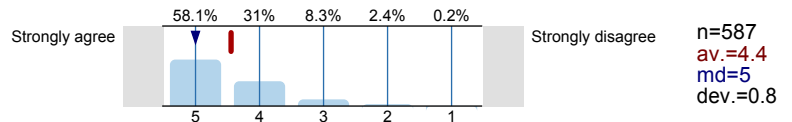
[CRU01] The unit's learning outcomes were clear to me.



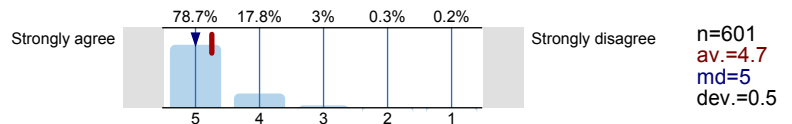
[CRU02] The assessment criteria were clearly defined.



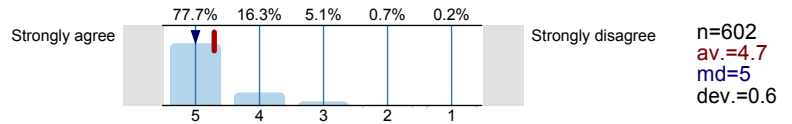
[CRU03] The grading standards or grade descriptors were clear to me.



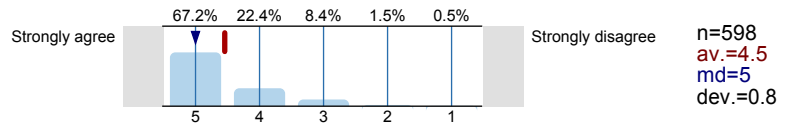
[CRU04] The information provided in this unit (unit guide/outline, handouts, websites etc) assisted my learning.



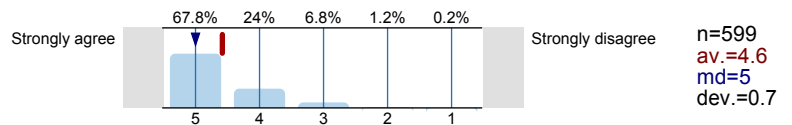
[CRU05] The unit content was organised in ways that assisted my learning.



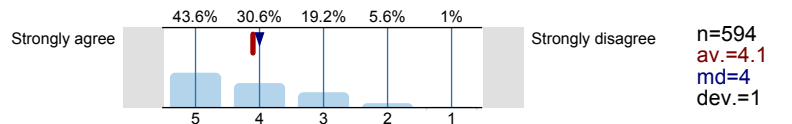
[CRU06] Teaching sessions (face-to-face and/or online) kept me engaged in the unit.



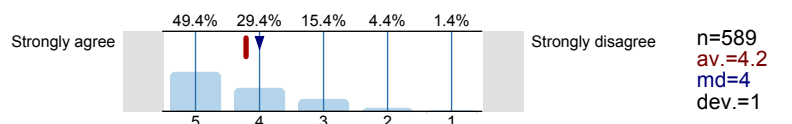
[CRU07] The unit's learning activities (e.g. assessments, in-class or online discussions and exercises) were effective in developing my understanding.



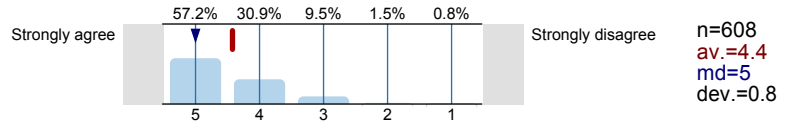
[CRU08] I received feedback on my work in time to make effective use of it in my learning.



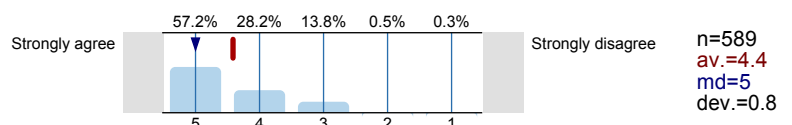
[CRU09] Overall the feedback I received helped me to improve my performance in this unit.



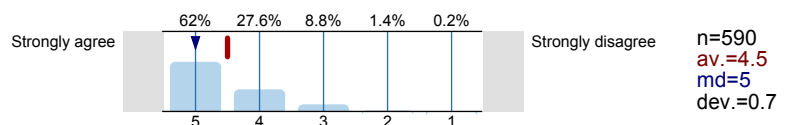
[CRU10] The amount of work required of me in this unit was reasonable.



[CRU11] This unit contributed to my development of one or more of the MQ Graduate capabilities.

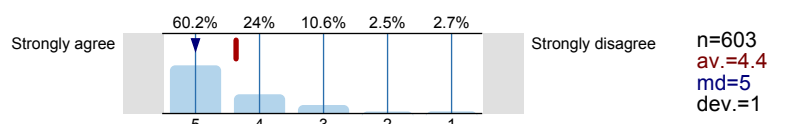


[CRU12] This unit challenged me intellectually.

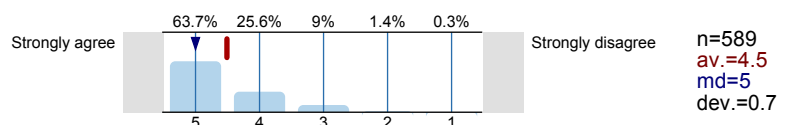


0100 LEU Individual Questions

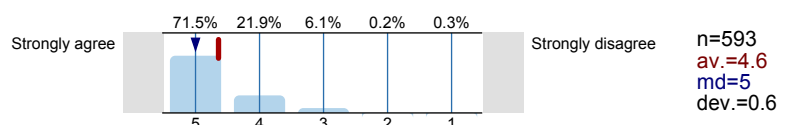
[GLU01] I would recommend this unit to other students.



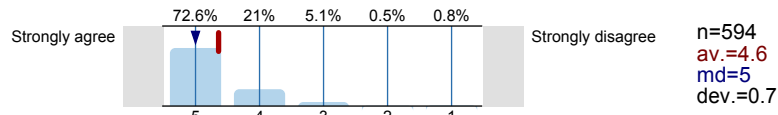
[GLU02] Overall, this unit provided me with a valuable learning experience.



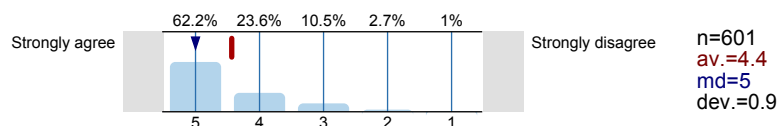
[CMU01] The resources provided with the unit (including online, written, etc) assisted my learning.



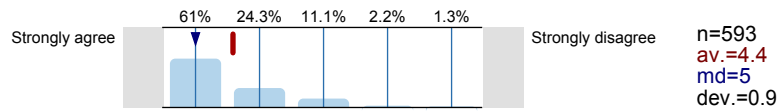
[COU01] The teaching staff on this unit presented the subject matter clearly.



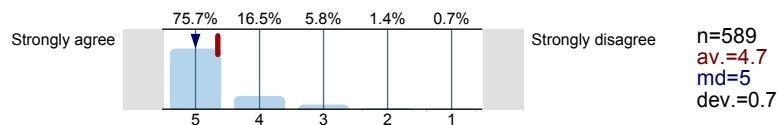
[ENU03] I enjoyed attending classes for this unit.



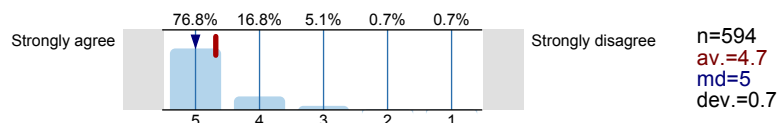
[ENU06] The teaching staff on this unit motivated me to do my best work.



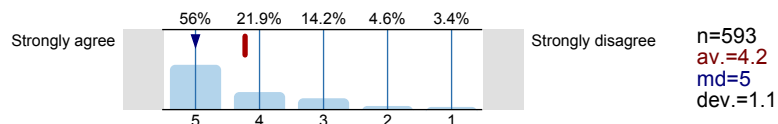
[ENU07] The teaching staff on this unit worked hard to make it interesting.



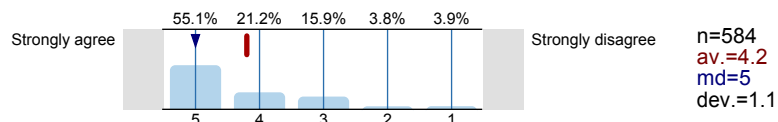
[ORU04] The teaching staff on this unit were well prepared for each class.



[TUU01] The tutorials for this unit assisted my understanding of the subject.



[TUU04] The tutorials for this unit helped me understand the lecture material.



Thesis Appendix C

The ethics approvals to conduct the research that is outlined in this thesis.



23 December 2014

Dr Yvonne Breyer
Director, Learning and Teaching
Faculty of Business and Economics
Macquarie University
NSW 2109

Dear Dr Breyer

Reference No: 5201400951

Title: Transforming the Entry-Level Economics Curriculum by Integrating Threshold Concepts

Thank you for submitting the above application for ethical and scientific review. Your application was considered by the Macquarie University Human Research Ethics Committee (HREC (Human Sciences & Humanities)) at its meeting on 24 October 2014 at which further information was requested to be reviewed by the Ethics Secretariat.

The requested information was received with correspondence on 15 December 2014.

I am pleased to advise that ethical and scientific approval has been granted for this project to be conducted at:

- Macquarie University

This research meets the requirements set out in the *National Statement on Ethical Conduct in Human Research* (2007 – Updated March 2014) (the *National Statement*).

Details of this approval are as follows:

Approval Date: 23 December 2014

The following documentation has been reviewed and approved by the HREC (Human Sciences & Humanities):

Documents reviewed	Version no.	Date
Macquarie University Ethics Application Form	2.3	July 2013
Correspondence from Mr Prashan Karunaratne responding to the issues raised by the HREC (Human Sciences and Humanities)		Received 15/12/2014
MQ Participant Information and Consent Form (PICF): Survey	2	22/12/2014
MQ Participant Information and Consent Form (PICF): Interview	1	12/12/2014
Recruitment Announcement		
Survey		

This letter constitutes ethical and scientific approval only.

Standard Conditions of Approval:

1. Continuing compliance with the requirements of the *National Statement*, which is available at the following website:

<http://www.nhmrc.gov.au/book/national-statement-ethical-conduct-human-research>

2. This approval is valid for five (5) years, subject to the submission of annual reports. Please submit your reports on the anniversary of the approval for this protocol.

3. All adverse events, including events which might affect the continued ethical and scientific acceptability of the project, must be reported to the HREC within 72 hours.

4. Proposed changes to the protocol must be submitted to the Committee for approval before implementation.

It is the responsibility of the Chief investigator to retain a copy of all documentation related to this project and to forward a copy of this approval letter to all personnel listed on the project.

Should you have any queries regarding your project, please contact the Ethics Secretariat on 9850 4194 or by email ethics.secretariat@mq.edu.au

The HREC (Human Sciences and Humanities) Terms of Reference and Standard Operating Procedures are available from the Research Office website at:

http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics

The HREC (Human Sciences and Humanities) wishes you every success in your research.

Yours sincerely

Dr Karolyn White

Director, Research Ethics & Integrity,

Chair, Human Research Ethics Committee (Human Sciences and Humanities)

This HREC is constituted and operates in accordance with the National Health and Medical Research Council's (NHMRC) *National Statement on Ethical Conduct in Human Research* (2007) and the *CPMP/ICH Note for Guidance on Good Clinical Practice*.

Approved - 5201500527

Yanru Ouyang

Tue 18/08/2015 10:18 AM

To: Yvonne Breyer <yvonne.breyer@mq.edu.au>;

Cc: Prashan Karunaratne <prashan.karunaratne@mq.edu.au>; Leigh Wood <leigh.wood@mq.edu.au>;

Importance: High

Dear Dr Breyer,

Re: 'Transforming the Entry-Level Economics Curriculum by Integrating Threshold Concepts.'

Reference No.: 5201500527

Thank you for your recent correspondence. Your response has addressed the issues raised by the Faculty of Business & Economics Human Research Ethics Sub Committee. Approval of the above application is granted, effective "13/08/2015". This email constitutes ethical approval only.

This research meets the requirements of the National Statement on Ethical Conduct in Human Research (2007). The National Statement is available at the following web site:

http://www.nhmrc.gov.au/_files_nhmrc/publications/attachments/e72.pdf.

The following personnel are authorised to conduct this research:

Dr Yvonne Breyer
Mr Prashan Shayanka Karunaratne
Professor Leigh Wood

NB. STUDENTS: IT IS YOUR RESPONSIBILITY TO KEEP A COPY OF THIS APPROVAL EMAIL TO SUBMIT WITH YOUR THESIS.

Please note the following standard requirements of approval:

1. The approval of this project is conditional upon your continuing compliance with the National Statement on Ethical Conduct in Human Research (2007).
2. Approval will be for a period of five (5) years subject to the provision of annual reports.

Progress Report 1 Due: 13th Aug. 2016
Progress Report 2 Due: 13th Aug. 2017

Progress Report 3 Due: 13th Aug. 2018

Progress Report 4 Due: 13th Aug. 2019

Final Report Due: 13th Aug. 2020

NB. If you complete the work earlier than you had planned you must submit a Final Report as soon as the work is completed. If the project has been discontinued or not commenced for any reason, you are also required to submit a Final Report for the project.

Progress reports and Final Reports are available at the following website:

http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/forms

3. If the project has run for more than five (5) years you cannot renew approval for the project. You will need to complete and submit a Final Report and submit a new application for the project. (The five year limit on renewal of approvals allows the Committee to fully re-review research in an environment where legislation, guidelines and requirements are continually changing, for example, new child protection and privacy laws).

4. All amendments to the project must be reviewed and approved by the Committee before implementation. Please complete and submit a Request for Amendment Form available at the following website:

http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/forms

5. Please notify the Committee immediately in the event of any adverse effects on participants or of any unforeseen events that affect the continued ethical acceptability of the project.

6. At all times you are responsible for the ethical conduct of your research in accordance with the guidelines established by the University. This information is available at the following websites:

<http://www.mq.edu.au/policy/>
http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/policy

If you will be applying for or have applied for internal or external funding for the above project it is your responsibility to provide the Macquarie University's Research Grants Management Assistant with a copy of this email as soon as possible. Internal and External funding agencies will not be informed that you have approval for your project and funds will not be released until the Research Grants Management Assistant has received a copy of this email.

If you need to provide a hard copy letter of approval to an external organisation as evidence that you have approval, please do not hesitate to contact the FBE Ethics Committee Secretariat, via fbe-ethics@mq.edu.au or

9850 4826.

Please retain a copy of this email as this is your official notification of ethics approval.

Yours sincerely,

Dr. Nikola Balnave
Chair, Faculty of Business and Economics Ethics Sub-Committee
Faculty of Business and Economics
Level 7, E4A Building
Macquarie University
NSW 2109 Australia
T: +61 2 9850 4826
F: +61 2 9850 6140
www.businessandeconomics.mq.edu.au/

Chief Investigator's / Supervisor's Name: Yvonne Breyer

Chief Investigator's / Supervisor's Title: Dr.

Participant Information – Survey

Name of Project: Transforming the Economics Curriculum by Integrating Threshold Concepts

You are invited to participate in a study of *Concepts in Economics*. The purpose of the study is to establish whether the economics concepts that students recognise that they have learned in higher education are aligned with the economics concepts outlined by Australia's and the UK's governing bodies of tertiary education quality and standards. The governing body for Australia is the Tertiary Quality and Standards Agency (TEQSA), and in the UK the equivalent body is the Quality Assurance Authority (QAA). Both these bodies have outlined the specific economic concepts that higher education in economics ought to impart to their students.

The study is being conducted by Dr. Yvonne Breyer, the director of Learning & Teaching in the Faculty of Business and Economics, Macquarie University [(e) yvonne.breyer@mq.edu.au (p) 98504412]. This research is being conducted to meet the requirements of a PhD in Economics under the supervision of Dr. Yvonne Breyer of the Faculty of Business & Economics. The PhD candidate is Mr Prashan Karunaratne [(e) prashan.karunaratne@mq.edu.au (p) 98508409]

If you decide to participate, you will be asked to list the concepts that you recognise having learned in economics. You will also be asked to list the concepts in economics that you find most difficult to learn. At the end of the questionnaire, you will be asked whether you would like to volunteer your time for a further in-depth interview to elaborate on your answers. You may simply participate in the written survey with no obligation to take part in the in-depth interview. The written survey should take approximately 5 to 10 minutes to complete. The survey is an anonymous survey that neither has an impact on your course grades nor your relationship with the unit supervisor of this economics unit, or any economics unit.

10 minutes after the survey is distributed, all folded survey papers, whether complete or incomplete will be collected via an anonymous drop-box, thus preserving the anonymity of the participants. Thus, no individual will be identifiable. The responses of this survey will be accessible to the investigators of this survey, the Department of Economics, and the Learning & Teaching officers of the Faculty of Business and Economics at Macquarie University. A summary of the results of the data can be made available to you on request by emailing the co-investigator at prashan.karunaratne@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. If you do not wish to participate in the survey, simply return your incomplete survey to the anonymous drop-box at the end of the survey time.

Data may be made available to other researchers for future Human Research Ethics Committee-approved research projects.

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 and 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.

(INVESTIGATOR'S [OR PARTICIPANT'S] COPY)

Thesis Appendix D

Teachers' Training: Transformative Learning and Teaching – Why, What, How and For Whom?

Kathmandu, Nepal, 27 September 2018.



MACQUARIE
University
SYDNEY · AUSTRALIA

Invitation

Macquarie University Faculty of Business and Economics

in association with

PAC Asia

Cordially invites you to an exclusive session on
Teacher's Training
focused on

Transformative Learning & Teaching
- Why, What, How and for Whom?

Key Speaker

Prashan Karunaratne,

Faculty of Business and Economics, Macquarie University, Australia

Additional Speaker

Riasat Hussain

Country Manager (South Asia), Macquarie University, Australia

The session will be held on

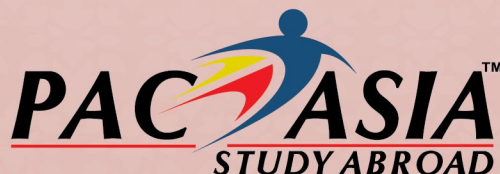
Thursday, September 27th, 2018 @ 3.30 pm

at Hotel Ambassador, The Consulate Hall, Lazimpat, Kathmandu

RSVP by 14th September 2018

Call: 01- 4222844, 4251404, 9808626729, 9813972652

Email: sujata@360education.edu.np, lisa@360education.edu.np



Transformative Learning & Teaching - Why, What, How and for Whom?

1. The workshop will look at how to rethink the curriculum around threshold concepts. This helps students with the 'why' of their learning.
2. The workshop will look at the education of learning progressions and teaching sequences and how to incorporate these into your teaching to enhance student learning outcomes.
3. We will also look at the revised Bloom's taxonomy as well as other learning taxonomies to equip academics with the tools to empower students to progress from lower-level thinking to higher-level thinking. This helps students with the 'how' of their learning.
4. How do we practically incorporate all these cutting-edge learning and teaching design techniques: R.E.A.L.: Re-Cap and Remind, Engaging Everyday Examples, Application & Awareness, Learning Life Lessons

SCHOOL COUNSELOR TRAINING SESSION RUN SHEET

3:30 pm - 4:00 pm	Registration and Hi-Tea
4:00 pm - 4:05 pm	Welcome Speech by Subash Gauchan, PAC Asia Nepal (5 mins)
4:05 pm - 4:15 pm	Advantages for International Student in Australia- Riasat Hussain, Country Manager (South Asia), Macquarie University (10mins)
4:15 pm - 4:30 pm	Macquarie at a Glance and scholarship and support services for International Students - Riasat Hussain, Country Manager (South Asia), Macquarie University (15mins)
4:30 pm - 5:30 pm	Masterclass on Transformative Learning and Teaching- Prashan Karunaratne, Adjunct Lecturer, Macquarie University (1 hour)
5:30 pm - 5:45 pm	Certification (15 mins) / Photo Session. Vote of thanks (2 mins)



Prashan Karunaratne

Adjunct Lecturer
Macquarie University, Australia



Prashan Karunaratne is an early-career academic whose enthusiasm for teaching economics and passion for improving student outcomes have inspired thousands of students. He believes that the learning journey is fruitful for both students and teachers when you inspire students to want to learn – by emphasising the ‘why’ of learning, and by empowering students to navigate their own learning journey – by focusing on the ‘how’ of learning. The engagement and impact of Prashan’s teaching resulted in an inaugural Student-Led Award for Excellence in Teaching and the Vice-Chancellor’s Award for Teaching Excellence at Macquarie University in 2017.

Prashan also takes part in Macquarie University’s school and community engagement initiative, LEAP (Learning, Education Aspiration, Participation), where one of his interactive economics lessons engages, equips and empowers school students from disadvantaged backgrounds, as well as regional Australia. Macquarie International presents this lesson as an exemplar live at expos and classrooms around Asia, including Bangladesh, China, India, Nepal and Sri Lanka. Prashan has also been invited to present his lessons in Singapore and the United Arab Emirates. On a worldwide scale, his YouTube channel, Prashan Economics, has more than 350,000 minutes of watch time.

Prashan’s multifaceted expertise has proven to be transferable beyond his subject area of economics. In 2017, he was part of a team of academics at Macquarie University that developed the popular Massive Open Online Course (MOOC) on Excel Skills for Business, hosted on the premier Coursera platform. In bidding for this course, the bid proposal was framed around Prashan’s REAL pedagogy. Prashan is the course instructor who presents a suite of four Excel courses, from beginner to advanced level. The transformative learning experience that Prashan enables in his classes on campus in Sydney, has translated into a transformative learning experience for 40,000 learners worldwide. In 2018, this team won one of the three annual Coursera awards – The Outstanding Educator Award for Transformation.

FIND OUT MORE

Macquarie University NSW 2109 Australia

T: +61 2 9850 8409

E: prashan.karunaratne@mq.edu.au

mq.edu.au

CRICOS Provider No 00002J



MACQUARIE
University
SYDNEY • AUSTRALIA

in association with



Teacher's Training

focused on

Transformative Learning & Teaching

- **Why, What, How and for Whom?**

Key Speaker

Lecturer Prashan Karunaratne

Faculty of Business and Economics
Macquarie University, Australia

Additional Speaker

Riasat Hussain

Country Manager (South Asia)
Macquarie University, Australia

Certificate of Training

This is to certify that

has successfully completed the

Teacher's Training

focused on

Transformative Learning & Teaching - Why, What, How and for Whom?

organized by

Macquarie University, Faculty of Business and Economics

Key Speaker

Lecturer Prashan Karunaratne

Faculty of Business and Economics, Macquarie University, Australia

in association with PAC Asia

on 27 September 2018, Thursday

Hotel Yak and Yeti, Kathmandu

Mr. Riasat Hussain

Country Manager (South Asia)
Macquarie University

Ms. Lisa Sherchan

Director
PAC Asia Nepal

Thesis Appendix E

Teachers' Training: Transformative Learning and Teaching – Why, What, How and For Whom?

Dhaka, Bangladesh, 1 October 2018.



Australian Government
Australian Trade and Investment Commission



INVITATION TO PARTICIPATE
**AUSTRALIAN EDUCATION
EXCELLENCE SEMINAR**
Dhaka, Bangladesh
1.10.2018

Australian Trade and Investment Commission

Australian High Commission

cordially invite you to

“Australian Education Excellence Seminar”

and

“Teachers training”

with Career Counsellors and teachers of Schools in
Bangladesh

on Monday, 1st October 2018

commencing at 11.00 am

RSVP: ☎88 0171 301 6030

Venue: Amari Dhaka

Address 47, Road No#41, Gulshan-2

Email: Mostafizur.rahman@ustrade.gov.au

Dress: Comfortable

Please RSVP by (20.09.2018)



Australian Government
Australian Trade and Investment Commission



Program

11:00 am - 11:10 am	Guests settle down
11:15 am - 11:30 am	Welcome and Australian Education excellence by Mostafizur Rahman, Business Development Manager, Australian Trade and Investment Commission (15mins)
11:30 am 11:40 am	Advantages for International Student in Australia- Riasat Hussain, Country Manager (South Asia), Macquarie University (10mins)
11:40 am - 11:55 am	Macquarie at a Glance and scholarship and support services for International Students– Riasat Hussain, Country Manager (South Asia), Macquarie University (15mins)
11:55 am - 12:30 pm	Masterclass on Transformative Learning and Teaching- Prashan Karunaratne, Adjunct Lecturer, Macquarie University
12:30 pm - 12:35 pm	Certification (10mins)
12:35 pm - 1:00pm	Refreshment and networking (30mins)



Prashan Karunaratne is an early-career academic whose enthusiasm for teaching economics and passion for improving student outcomes have inspired thousands of students. He believes that the learning journey is fruitful for both students and teachers when you inspire students to want to learn – by emphasising the ‘why’ of learning, and by empowering students to navigate their own learning journey – by focusing on the ‘how’ of learning. The engagement and impact of Prashan’s teaching resulted in an [inaugural Student-Led Award for Excellence in Teaching and the Vice-Chancellor’s Award for Teaching Excellence at Macquarie University in 2017](#).

To emphasise the ‘why’ of learning, Prashan frames his teaching methodology on research into threshold concepts, emphasising the transferable skills that economics has to offer. In doing so, Prashan presents at premier conferences and publishes in premier journals in this field. His first publication was in an A* journal, currently at more than 5000 downloads, and this publication is cited by other scholars. This paper was awarded the [best paper award at his first Australasian Teaching Economics Conference in 2016](#).

To focus on the ‘how’ of learning, Prashan has developed his own unique four-step pedagogy based on Bloom’s taxonomy, summarised as [REAL – Review, recap and remind; Engaging everyday examples; Application and awareness; Learning life lessons](#). Prashan’s pedagogy and exemplars are exhibited through a variety of media outlets at Macquarie University. He actively empowers other academics by leading a variety of learning and teaching workshops. His teaching model has been adopted in an economics unit at Wuhan University, China.

Prashan also takes part in [Macquarie University’s school and community engagement initiative, LEAP \(Learning, Education Aspiration, Participation\)](#), where one of his interactive economics lessons engages, equips and empowers school students from disadvantaged backgrounds, as well as regional Australia. Macquarie International presents this lesson as an exemplar live at expos and classrooms around Asia, including China, India, Sri Lanka, Bangladesh and Nepal. On a worldwide scale, his [YouTube channel, Prashan Economics, has more than 350,000 minutes of watch time](#).

In 2017, he was part of a team of academics at Macquarie University that developed the popular Massive Open Online Course (MOOC) on [Excel Skills for Business, hosted on the premier Coursera platform](#). In 2018, this team won one of the three annual Coursera awards – [The Outstanding Educator Award for Transformation](#).

About Macquarie University:

Macquarie University, Sydney, is one of Australia’s top 10 multi-disciplinary universities, bringing together 40,000 students and 3,000 staff in one thriving hub of discovery. With a 5-star QS rating, it is ranked among top two per cent of universities in the world. Established in 1964, it is located just 15 kilometres from Sydney’s city centre in one of the largest business and technology precincts in the Southern Hemisphere. Many of the best universities across the US, UK, Europe and Asia choose to partner with us, as do global organisations such as Microsoft, Optus, Google, and Johnson & Johnson. 100 per cent of the University’s research is ranked at world standard or above and more than 100 of its researchers are ranked in the top one per cent of researchers in the world.

Weblinks:

Macquarie University: <https://www.mq.edu.au>

Prashan Karunaratne: <https://researchers.mq.edu.au/en/persons/prashan-karunaratne>

Why academics should use social media: <https://www.youtube.com/watch?v=zXtqtOlecus>

Certificate of Participation

This is to certify that

has participated in the
‘Australian Education Excellence Seminar’

organised by Macquarie University, Australia and Australian Trade and Investment

Commission Bangladesh on

1st October 2018

Nicole Brigg
Pro Vice-Chancellor (International)
Macquarie University



MACQUARIE
University
SYDNEY · AUSTRALIA

... be transformed by the renewing of your mind.

– St. Paul

