TAXATION, INNOVATION AND EDUCATION: REFLECTIONS ON A FLIPPED LECTURE ROOM

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ABSTRACT

In recent times the use of flipped classrooms in tertiary education has become more prevalent. This article considers the implementation of a flipped classroom structure to deliver Taxation Law at the University of Western Australia. The Taxation Law unit is a core subject in the Business Law major with over 150 students. The unit examines the basic concepts and fundamentals of Australian taxation law. Delivery of the unit was changed from a traditional lecture and tutorial model to a blended learning or flipped classroom. The current delivery mode includes a combination of short videos, online reading materials, online learning activities, and in-person workshops and tutorials. This article identifies why and how change was implemented and the pedagogical theory underlying the change in delivery mode, and discusses the effectiveness of the change using an action research design. In particular, the article will examine key risks in developing and implementing this type of delivery mode, along with quantitative and qualitative data to highlight changes in student perceptions, student motivation and engagement, student achievement, and teacher perceptions.

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I INTRODUCTION

Taxation Law was established as a new unit at the University of Western Australia ('UWA') in 2013 as a large core unit in a Business Law major for undergraduate students. The unit was originally designed to comprise weekly lectures and tutorials, with assessment consisting of tutorial participation, an assignment and a final exam. However, student satisfaction and engagement was low, and lecture attendance was approximately 15 per cent for most classes. The unit was not much fun to teach, and teaching staff were spending a disproportionate amount of time on administrative matters. Pedagogical theory suggests that flipping a classroom should help address some of these issues;[1] and so, with the help of UWA's Educational Enhancement Unit, we flipped the classroom. Lecture content and activities were placed online and lectures converted to workshops. Tutorials were retained. Student perceptions of pastoral care and of flexibility, as well as student motivation and engagement and teacher enjoyment all generally increased. There is also some weak evidence supporting an increase in student achievement. However, student feedback indicated an ongoing desire for a more prescriptive narrative and more coordinated reinforcement of that narrative in teaching materials. There were also some initial perceptions by the teaching staff in the unit of mild institutional resistance.

This article reflects on our experience of flipping Taxation Law, in order to assist any teachers thinking of flipping their own tax classes. To this end, Section II of this article explains the problems associated with the original design of the unit, and how we flipped the classroom to address these difficulties. Section III outlines the pedagogical theory that supports the introduction of flipped classrooms and the improvements that might be expected following the introduction of a flipped classroom. It also surveys the literature on flipped classrooms, and key risks and challenges associated with implementation. Section IV outlines the methodology adopted. Section V then outlines the results from our implementation of a flipped classroom in the Taxation Law unit, and discusses those results under the themes of student perceptions, student motivation and engagement, student achievement, and teacher perceptions. Section VI concludes.

II THE PROBLEM AND THE RESPONSE

This section provides an overview of the Taxation Law unit and how it was taught prior to the introduction of a flipped classroom model. It also examines why the decision was made to trial a flipped classroom, and outlines the specific changes that were made to the unit. Before moving to that discussion, it is important to note the key common characteristics of a flipped classroom:[2]

- a change in the use of out-of-class time
- completing traditional in-class activities out of class

[1] See, for example, Lakmal Abeysekera and Phillip Dawson, 'Motivation and Cognitive Load in the Flipped Classroom: Definition, Rationale, and a Call for Research' (2015) 34(1) *Higher Education Research & Development* 3.
[2] Ibid 3.

- pre-class activities
- post-class activities
- use of technology
- a change in the use of classroom time
- completing traditional homework activities in class
- in-class activities that emphasise active, peer and problem-based learning.

A *The original design of the Taxation Law unit*

Before examining the changes that were made to the Taxation Law unit, it is helpful to examine its original format. The Taxation Law unit was first offered at UWA in 2013 and is a core unit for students enrolled in a Bachelor of Commerce majoring in Business Law. It is also offered to students enrolled in the Bachelor of Philosophy and to all other undergraduate students as an elective unit. The Taxation Law unit is designed to provide students with a basic understanding of Australian taxation law, how it is administered, and the ethical and professional responsibilities of a tax practitioner. The unit is intended to act as a foundational unit for further tax study. Students do not generally have a detailed knowledge of the law, but are required to have first studied two other introductory law units.

The Taxation Law unit was originally designed in much the same way that most law units are traditionally structured in Australian universities. In this regard, the unit employed a 'traditional model of legal education',[3] consisting of two hours of lectures and a one-hour tutorial each week. This amounted to a total of 26 hours of lectures and 11 hours of tutorials over the semester. Students were also assigned approximately four hours per week of out-of-class reading from a textbook. The unit was designed such that the total study commitment, including attending lectures, tutorial preparation and attendance, and completing the assigned readings and assessments, was approximately 115 hours.

At the end of the unit, it was expected that students would have a foundation-level understanding of the following topics:

- the key components of the Australian income taxation system, including income, deductions, capital allowances, tax accounting and trading stock
- how Australian taxation law applies to individuals, companies, partnerships and trusts
- the purposes and operation of goods and services tax ('GST') and fringe benefits tax ('FBT')
- the ethical and professional responsibilities of a tax practitioner
- the functions of the Commissioner of Taxation and the Australian Taxation Office.

The assessment comprised tutorial participation (10 per cent of the total grade), an assignment (30 per cent) and a final exam (60 per cent). The tutorials were taught in a small-group environment consisting of approximately 15 to 20 students. Problem- and

[3] Mary Keyes and Richard Johnstone, 'Changing Legal Education: Rhetoric, Reality and Prospects for the Future' (2004) 26 *Sydney Law Review* 537, 537; Elizabeth Shi, Paul Myers and Freeman Zhong, 'Interteaching: An Alternative Format of Instruction for Law Classes' (2018) 11 *Journal of the Australasian Law Teachers Association* 58, 58.

policy-based tutorial questions were released to students online through the university's online learning management system (Blackboard), and the students were expected to prepare before attending classes. The assignment generally required students to write a 2,000-word essay on a set question, while the two-hour final exam required students to apply what they had learned during the semester to two long-format problem-based questions.

B *The problem with the original design of the Taxation Law unit — student and lecturer satisfaction a catalyst for change*

Before the flipped classroom was implemented, student satisfaction in the Taxation Law unit was low. Between 2013 and 2015, students were asked whether they 'strongly disagree', 'disagree', 'agree' or 'strongly agree' with the statement: 'Overall, this unit was a good educational experience.' The results are summarised in Table 1.

Table 1: Survey results to the question: 'Was the unit a good educational experience?'

Period	Response rate (%)	No of responses (with %)			
		Strongly disagree	Disagree	Agree	Strongly agree
2013	36.59%	6 (13.33%)	14 (31.11%)	23 (51.11%)	2 (4.44%)
2014	25.79%	4 (8.16%)	16 (32.65%)	26 (53.06%)	3 (6.12%)
2015	38.46%	5 (7.14%)	19 (27.14%)	39 (55.71%)	7 (10.00%)

Clearly, a large number of students did not think that the Taxation Law unit was a 'good educational experience', with 44.44 per cent (2013), 40.81 per cent (2014) and 34.28 per cent (2015) indicating that they strongly disagreed or disagreed with the survey question.[4] Between 2013 and 2015, the unit coordinators made various changes to the unit, taking into account both quantitative and qualitative feedback from students, whilst still retaining the traditional model of legal education. This experience is consistent with that of Cameron and Dickfos, who observe that a 'traditional lecture format in law courses is unlikely to quell … student disenchantment because it does not promote active student learning or address the variety of student learning styles'.[5] Nevertheless, while the changes made by the unit coordinators resulted in some improvement in student satisfaction, the student experience in the unit lagged behind other units taught in the law school, and the coordinators felt that there was further scope for improvement.

There were also a number of other challenges encountered in 2013–15 that led the unit coordinators to consider changing the teaching methodology. While lectures in the unit

[4] Note that the same unit coordinator was responsible for the unit in 2013 and 2014. A new unit coordinator was appointed in 2015 (with the previous unit coordinator still being involved in the delivery of half of the lectures). However, as the results indicate, this change in staffing arrangements, together with the other changes made to the unit, did not, in the authors' view, produce an acceptable improvement to student satisfaction.

[5] Craig Cameron and Jennifer Dickfos, 'Peer Review of Teaching Law to Business Students in Traditional and Flipped Lecture Environments' in Christopher Klopper and Steve Drew (eds), *Teaching for Learning and Learning for Teaching* (Sense Publishers, 2015) 99, 100.

were recorded, the lecture-recording facilities proved to be unreliable, with lectures regularly failing to record or lecture recordings being of a poor quality. This particular issue resulted in several students complaining to the unit coordinator about lecture recordings, and may also have influenced the low student satisfaction with the unit. For example, in 2015, 40 per cent of the qualitative feedback focused on issues with the contemporaneous lecture recordings.

Furthermore, lectures were characterised by low student attendance, often with fewer than 20 students in the room, and low student engagement, with questions posed by the lecturer to the students often going unanswered. The unit also generated a significant administrative load for the unit coordinator when compared to other units with a similar number of student enrolments. In this regard, the unit coordinator would receive many queries from students that ordinarily would have been raised by the student and addressed in class, had the student attended lectures. These factors contributed to the unit coordinators and other teaching staff having a low sense of satisfaction with the unit.

C *Redesigning the unit and implementing a flipped classroom model*

Before any changes were made, a comprehensive review of the unit was carried out by the lecturers in conjunction with teaching and learning-enhancement staff. The assessment structure, teaching modes and unit content were closely examined before a decision was made to restructure the unit, utilising a flipped classroom model.

Additionally, the Taxation Law unit, in its traditional form, had been approved by the Tax Practitioners Board under the *Tax Agent Services Regulations 2009* (Cth) and satisfied the educational requirements of a number of accounting professional associations. It was important to ensure that this accreditation was not put at risk when flipping the classroom and that the unit still consisted of face-to-face classes (workshops and tutorials), private study and research totalling 100–130 hours.[6] For this reason, it was not possible to make any substantive changes to the course content or the number of hours to complete the unit, because doing so would likely require reaccreditation.

Flipping the unit involved breaking the 26 lectures into 13 online learning modules[7] and making approximately 1.5 hours of video recordings for each module. Most modules comprised between four and six videos, which were generally around 15 minutes, but were occasionally up to 30 minutes. This amounted to around 21 hours of recordings, which was slightly less time than the time previously spent in lectures. The recordings were made using the university's recording software (Camtasia), edited and uploaded to YouTube.[8] The recordings were made publicly available on YouTube, but were 'unlisted' such that they would not appear in searches carried out on the YouTube platform. A link

[6] Tax Practitioner's Board, Australian Government, *Proposed TPB Guideline: Course in Australian Taxation Law that Is Approved by the Board* (TPB(PG) No 03/2010, 16 December 2010) 13 and 16.

[7] The initial modules were: introduction to the Australian tax system; the income tax formula; ordinary income; statutory income, exempt income and non-assessable non-exempt income; general deductions; specific deductions and capital allowances; capital gains tax; tax timing and trading stock; taxation of companies, partnerships and trusts; GST; FBT; residence and source; tax administration and professional responsibilities.

[8] We do not discuss intellectual property issues in this article, but they are clearly relevant, especially where content is publicly available.

to the YouTube video was then placed on the online learning management system. Reading material was assigned for each module, typically textbook pages, some summary lecture notes, cases and legislation (the readings were similar to the readings previously provided for out-of-class study following each traditional lecture). Again, this material was specified and, where possible, linked on the learning management system. Additional study questions and solutions were developed for each online module and placed online. Some of these were based on questions that had previously been posed in lectures to students or assigned previously as out-of-class reading.

Concise and clear instructions were provided to students about how they should undertake their self-directed learning and how to prepare for and what to expect from the in-class workshops. These instructions were provided on the unit's learning management system web page, in the unit outline and in the first workshop. In addition, in the unit outline and at the first workshop we explained to students why the unit had been flipped, with reference to the low student satisfaction and engagement.

The explanation below was provided to students on starting the unit, and summarises how the unit was restructured as a flipped and blended learning experience:

> This unit will be taught differently to some of the other units you may have taken.
>
> It is comprised of 13 online modules with each covering a different area of Taxation Law. The modules can be accessed through the unit website on Blackboard at www.lms.uwa.edu.au. It is suggested that you complete one module each week in accordance with the Unit Schedule in the unit outline.
>
> This unit does not involve any traditional face-to-face lectures. Instead, traditional lectures have been replaced by short video clips on Blackboard. This means that each module is designed to allow you to learn at your own pace (and from the comfort of your own home!).
>
> Each module is broken into four sections:
>
> **What is this module about?**
>
> This section gives a general overview of the content that will be covered in the module.
>
> **Watch it!**
>
> You should start each module by watching the video clips which are intended to guide you through the relevant legislation, case law and readings. The video clips are not intended to cover every aspect of the course in detail but, instead, are designed to explain key concepts and highlight important issues.
>
> **Read it!**
>
> Once you have watched the video clips, you should complete the required readings which are listed in this section of the Module. The readings are intended to cover the finer points of the concepts which may have been discussed in the video clips. These readings will form part of the assessable content for the unit.
>
> **Apply it!**

> Once you have watched the video clips and completed the readings, you should consolidate your learning by attempting to answer the questions listed in this section of the Module. Once you have answered the questions, you can then check how you went by comparing your answers to the Answer Guide. You will also have the opportunity to apply what you have learnt in each Module by attending the Interactive Workshops and Tutorials.
>
> In place of lectures, you will attend tutorials and interactive workshops. The interactive workshops are designed to support you in completing the assessments in this unit. There are two workshops to help you complete the assignment and four workshops to help you prepare for the final exam. It is an expectation that students will attend all of the interactive workshops.

Thus, the transmission of information and initial short testing of student understanding of concepts was all shifted online, where students had the ability to control the pace and order of study. In terms of face-to-face activities, lectures were replaced by six 1.5-hour interactive workshops spread across the semester. The workshops were expressly geared toward supporting student preparation for assessment tasks (the same assessment structure was retained), with two workshops focused on preparing students for their assignment and the remaining workshops being in the style of mock exams. At the beginning of each workshop, students were placed in groups of around four to five, which generally worked out to around 25 groups. For each workshop the lecturer was assisted by several tax practitioners from accounting firms (and sometimes additional lecturers), which provided excellent modelling and also industry contacts. It also meant that each facilitator had responsibility for around eight groups, which proved manageable. Answers were debated within groups and then shared and peer- and teacher-reviewed using the discussion board on Blackboard.

The rooms utilised for the workshops were standard lecture rooms. However, as there were several facilitators (including the lecturer and tax practitioners) and the students were divided into small groups, there was ample opportunity for the lecturer/facilitator to walk around the room and interact with each group individually. Recording of the workshops was not practicable given the number of participants/students talking and the group-work format of the activities. Whilst the inability to record workshops may have resulted in a reduction in flexibility for some students, attendance at the workshops was not compulsory, there were only six workshops across the course of the semester (meaning face-to-face contact hours were kept to a minimum), and all students taking the unit were enrolled to study the unit on-campus.

To give a sense of what each workshop involved and the ways that peer- and teacher-led learning occurred, Example 1 shows sample instructions provided to students.

Example 1: Workshop structure

> **Purpose?**
>
> The purpose of this workshop is to help you prepare for the final exam by tackling mock exam questions on Modules 1 to 3.
>
> **What should I do to prepare?**
>
> - Complete Modules 1 to 3 on Blackboard.

- Attempt to answer the Mock Exam on Modules 1 to 3.
- Bring your answers to the Mock Exam with you to the workshop.

What will we do in the workshop?

- The lecturer will break students into groups.
- Students will have time to complete the mock exam questions in their groups.
- The lecturer will move between the groups and answer any questions.
- Groups will post their answers to the mock exam questions on the discussion board.
- Groups will then 'mark' the answers posted on the discussion board by assigning a rating out of 5.
- We will then discuss the best answer and how it could be improved.

One workshop differed materially in that it involved students bringing a draft of their assignment question and obtaining peer and teacher feedback in class.[9] Here there was a broader range of issues, making it vitally important to focus on certain core matters, such as modelling the use of the IRAC (issue, rule, analysis and conclusion) method to answer an issue, modelling the function of an introduction and identifying examples of proper referencing.

III LITERATURE REVIEW

A *Pedagogical basis for flipping the classroom*

The flipped classroom model shifts the focus away from didactic teaching to a student-centric approach to learning. It can promote flexibility in the learning environment. However, in general, the flipped classroom is considered to be under-theorised, under-researched, and scant in rigorous methods. Nevertheless, the general understanding of the pedagogy underpinning a flipped classroom is:[10]

- the movement of information-transmission teaching out of the classroom
- use of class time for learning activities that are active and social
- a requirement for students to complete pre- and/or post-class activities to fully benefit from in-class work.

[9] The other assignment workshop involved more discrete issues and more general assignment-writing training.
[10] Abeysekera and Dawson (n 1) 3.

Thus, while several studies have found that the traditional lecture format in law courses does not promote 'active learning',[11] in contrast, the literature suggests that a flipped classroom can promote it.[12] Active learning occurs where students do not passively receive information about a concept, but themselves work on a question or task to help gain understanding of the concept.[13] Indeed, Comber and Brady-Van den Bos suggest that it may be the in-class active- and peer-learning activities that foster student learning to a greater extent than the flipped classroom model itself.[14]

While there are concerns around the removal of the lecture and therefore face-to-face contact, studies have demonstrated the flipped classroom model improves the teacher/student dynamic. In fact, there is some evidence to suggest that a flipped classroom is the preferred learning environment for business students studying law units.[15] This may be because under a flipped classroom model teachers act as 'the guide on the side', facilitating discussions and providing greater support and clarification for students, in contrast to a traditional lecture format where students remain passive during lectures.[16] As Cameron and Dickfos observe:[17]

> The 'flipped lecture' can reconceptualise the traditional lecture format by reducing the amount of material delivered in the lecture. As a consequence, time can be devoted during the lecture for activities that encourage students to engage in deep learning.

In terms of support, Comber and Brady-Van den Bos also found that students perceived their lecturer to have a genuine interest in their learning, which contributed to the success of the flipped classroom model.[18] Their findings also speak to the lecturer creating a safe, inclusive and accepting learning environment, with students feeling comfortable to engage in group discussions. In another study, just-in-time feedback from tutors indicated the significance of teacher presence in workshop settings, where students perceived the better the support, the more engaged they felt to work on the in-class activities.[19] Furthermore, the interactive nature of the in-class peer-learning activities were cited by students to be at the core of a successful flipped classroom.[20]

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[11] See, generally, Richard Johnstone, 'Rethinking the Teaching of Law' (1992) 3(1) *Legal Education Review* 1; Marlene Le Brun and Richard Johnstone, *The Quiet (R)evolution: Improving Student Learning in Law* (Law Book Company, 1994); Cameron and Dickfos (n 5) 100.

[12] Cf Abeysekera and Dawson (n 1) 2; Cameron and Dickfos (n 5) 100–1.

[13] As to active learning, see, for example, T Andrews et al, 'Active Learning Not Associated with Student Learning in a Random Sample of College Biology Courses' (2011) 10(4) *CBE Life Sciences Education* 394, 394.

[14] Darren PM Comber and Mirjam Brady-Van den Bos, 'Too Much, Too Soon? A Critical Investigation into Factors that Make Flipped Classrooms Effective' (2018) 37(4) *Higher Education Research & Development* 685, 689–90. See also Debra D Burke, 'Scale-Up! Classroom Design and Use Can Facilitate Learning' (2015) 49 *The Law Teacher* 189, 191, 192.

[15] Cameron and Dickfos (n 5) 99.

[16] Ibid 100.

[17] Ibid 101.

[18] Comber and Brady-Van den Bos (n 14) 690.

[19] Min Kyu Kim et al, 'The Experience of Three Flipped Classrooms in an Urban University: An Exploration of Design Principles' (2014) 22 *Internet and Higher Education* 42.

[20] Comber and Brady-Van den Bos (n 14) 689. See also Kylie Burns et al, 'Active Learning in Law by Flipping the Classroom: An Enquiry into Effectiveness and Engagement' (2017) 27(1) *Legal Education Review* 4;

However, a flipped classroom must be implemented with care, and O'Flaherty and Phillips highlight the need to ensure that in-class activities do indeed involve active learning and integrate into the overall structure of the course.[21] Moreover, one of the main criticisms with flipped classroom environments is that they rely on student commitment to complete pre-class activities and actively participate in in-class activities.[22] Therefore, understanding the key themes that underpin student motivation can enhance the support of this engagement, and empower students to support their basic cognitive needs within the learning context.

While research into the pedagogy of flipped classrooms is still growing,[23] Abeysekera and Dawson offer a theoretical model. It consists of a series of propositions identifying the pedagogical basis for the flipped classroom to support student learning through motivation (self-determination theory) and delivery of instructional and learning design (cognitive load theory).[24] They argue that flipped classrooms can support student motivation by meeting these psychological needs within the learning environment.

B *Self-determination theory*

Self-determination theory states there are three psychological needs to intrinsic and extrinsic motivation. [25] These are: competence (a sense of control and mastery of knowledge); relatedness (a sense of interaction and connection with others); and autonomy (a sense of independence over the learning journey).

The flipped classroom model can meet these aspects of self-determination theory, whereby students can feel competence through participating in active-learning activities, such as peer collaboration. These contexts of engagement and interaction with peers enhance intrinsic motivation. The sense of competence must be accompanied by feelings of autonomy, and occur in social contexts that create a perceived sense of relatedness to peers and with instructors (such as small numbers in group-work settings), in order to foster intrinsic motivation in students to commit to completing the work.[26] Intrinsic motivation can be fostered when learning activities are an inherently satisfying experience for the student.

Extrinsic motivation is driven by external factors, such as grades.[27] While a common theme in higher education is that students will not complete a task unless grades are attached, self-determination theory offers the chance to integrate personal and course

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Gerald F Hess, 'Blended Courses in Law School: The Best of Online and Face-to-Face Learning?' (2013) 45 *McGeorge Law Review* 51, 56.

[21] Jacqueline O'Flaherty and Craig Phillips, 'The Use of Flipped Classrooms in Higher Education: A Scoping Review' (2015) 25 *Internet and Higher Education* 85, citing Bill Tucker, 'The Flipped Classroom: Online Instruction at Home Frees Class Time for Learning' (2012) 12(1) *Education Next* 82, 82–3.

[22] Cameron and Dickfos (n 5) 102.

[23] Sarah J DeLozier and Matthew G Rhodes, 'Flipped Classrooms: A Review of Key Ideas and Recommendations for Practice' (2017) 29 *Educational Psychology Review* 141, 142.

[24] Abeysekera and Dawson (n 1) 4.

[25] Ibid; Edward Deci and Richard Ryan, *Intrinsic Motivation and Self-Determination in Human Behaviour* (Plenum Press, 1985).

[26] Abeysekera and Dawson (n 1) 4–6.

[27] Richard Ryan and Edward Deci, 'Intrinsic and Extrinsic Motivations: Classic Definitions and New Directions' (2000) 25(1) *Contemporary Educational Psychology* 54.

values that are fostered through the learning environments.[28] There are varying types of extrinsic motivation that can achieve this degree of integration, which is also relative to the degree of autonomy. These types of extrinsic motivation vary from motivation driven by external rewards or demands (such as completing an activity as requested by a teacher), to more integrated regulation — for instance, where goals are extrinsic, but there is also enjoyment in the experience that is inherent to the activity (such as a student taking the lead on a group project because it satisfies their need to be in charge, while enjoying the group activity as a secondary motivator).[29]

C *Cognitive load theory*

Cognitive load theory is an instructional theory regarding the effort required for the working memory.[30] This effort reflects the limitations on the mental capacity to develop schemata.[31] In this regard, research by Cameron and Dickfos suggests that some students may have a perception of 'information overload' under a flipped classroom model.[32] Understanding cognitive load can assist instructors in designing learning activities that mitigate an overload in mental processing of information.

There are three types of cognitive load to be considered. First, intrinsic load relates to the qualities that are inherent to the concept at hand. The ability to call on existing schemata assists students with the processing of this intrinsic load.[33] Second, extraneous load relates to the method in which the information is delivered, which can present additional complexities requiring further effort to process. This could be a poorly delivered lecture with too much information on slides or insufficiently connected teaching materials, resulting in cognitive overload. The third and final type of cognitive load is germane load — the effort required to process the information into a new schema. An example of this type of load is when a student explains a newly acquired concept in a peer-collaborative group setting.

Abeysekera and Dawson suggest that the flipped classroom model supports cognitive load theory through shifting the information-transmission of teaching to outside the lecture in the form of pre-class activities, as evidenced by other studies.[34] These pre-class activities can be: micro-lectures, pre-recorded in 10- to 15-minute videos; other multimedia resources, such as YouTube videos; online resources; or pre-reading

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[28] Abeysekera and Dawson (n 1) 6, citing Deci and Ryan (n 25). See also Marylene Gagne and Edward Deci, 'Self-Determination Theory and Work Motivation' (2005) 26 *Journal of Organizational Behaviour* 331, 333–4.

[29] Abeysekera and Dawson (n 1) 6.

[30] John Sweller, 'Cognitive Load Theory' in Jose P Mestre and Brian H Ross (eds), *The Psychology of Learning and Motivation* (Elsevier, 2011) vol 55, 38.

[31] Tina Seufert, 'The Interplay between Self-Regulation in Learning and Cognitive Load' (2018) 24 *Educational Research Review* 117. Schema (plural schemata or schemas) is the mental process of organising information.

[32] Cameron and Dickfos (n 5) 112.

[33] Ibid 117.

[34] Abeysekera and Dawson (n 1), citing Ruth C Clark, Frank Nguyen and John Sweller, *Efficiency in Learning: Evidence-Based Guidelines to Manage Cognitive Load* (Pfeiffer, 1st ed, 2005); Paul Ginns, 'Meta-Analysis of the Modality Effect' (2005) 15(4) *Learning and Instruction* 313; Ron Owston, Denys Lupshenyuk and Herb Wideman, 'Lecture Capture in Large Undergraduate Classes: Student Perceptions and Academic Performance' (2011) 14(4) *Internet and Higher Education* 262.

materials, such as journal articles and textbooks. Research by Butt suggests that the student learning experience in a flipped classroom environment can be improved by making short pre-recorded video lectures available to students.[35] These pre-class activities allow students the flexibility to view the resources multiple times, and in a method that is tailored to their ideal process, such as pausing videos to write down notes. Therefore, Abeysekera and Dawson propose the flipped classroom model is ideal for students, as it supports their tailored needs and reduces cognitive overload through self-paced learning.[36]

Abeysekera and Dawson also propose the flipped classroom model provides scope for learning design activities to be tailored to the degree of student expertise in the subject matter.[37] Unit coordinators are faced with the challenge of providing a learning experience to accommodate an increasingly diverse student cohort, from domestic and international students and high school leavers, to students returning to study after 20 years in the workforce. Therefore, the deliberate intent of tailoring pre-class activities to be scaffolded to suit the needs of varying degrees of student expertise could potentially support the management of cognitive load.[38]

D *Key risks and challenges*

The adoption of a flipped classroom model is not entirely without risks and challenges. In particular, it is important to consider student perceptions of change and that changes do not adversely impact student motivation or workload, as well as considering staff perceptions and workload. Further, our flipped unit, akin to many flipped classrooms, involved group workshops, which raises a series of challenges.

1 *Student perceptions*

As flipped classroom approaches are still relatively novel, students can be hesitant to embrace a different approach from the traditional lecture, and some students dislike taking greater responsibility for their own learning and having to spend time covering course content outside of classes.[39] Recent research by Butt suggests that the majority of students will view the introduction of a flipped classroom positively.[40] However, when implementing a flipped classroom, Butt argues that it is still necessary to provide a variety of different learning opportunities (such as video recordings, course materials and tutorials), due to the perceived value different students place on different learning activities.[41] It is thus critical to explain to students why the class has been flipped, what

[35] Adam Butt, 'Students Views on the Use of a Flipped Classroom Approach: Evidence from Australia' (2014) 6(1) *Business Education & Accreditation* 33, 40.
[36] Abeysekera and Dawson (n 1) 9.
[37] Ibid 9–10.
[38] Alison S Burke and Brian Fedorek, 'Does "Flipping" Promote Engagement?: A Comparison of a Traditional, Online, and Flipped Class' (2017) 18 *Active Learning in Higher Education* 11, 14.
[39] Burns et al (n 20) 6; O'Flaherty and Phillips (n 21) 85, 89, 94; Anne E Mullins, 'The Flipped Classroom: Fad or Innovation?' (2015) 92 *Oregon Law Review Online* 27, 29.
[40] Butt (n 35) 38.
[41] Ibid.

the new expectations of students are under this format and how students ought to undertake self-directed learning.[42]

2 *Student engagement and motivation*

While motivating students to engage in content is an inherent challenge to all teaching and learning strategies,[43] it is perhaps more acute in the context of a flipped classroom. This is because a flipped classroom model involves a student-centred approach where a greater responsibility for learning is placed on the student (when compared to a traditional classroom model). In this regard, students in our flipped classroom environment were required to complete the online learning modules and set tasks prior to participating in the workshops.[44] This relies on students both understanding the approach of the model and having sufficient motivation to complete pre-class activities. If students did not complete the pre-class activities, they would not have sufficient grounding to then participate in the workshops. However, a key strategy employed to enhance student engagement and motivation was to align workshops with assessment tasks in the unit. It was hoped that aligning the workshops with assessment items would motivate students to complete their pre-class activities, keep up with the online learning modules and attend the workshops.

3 *Student workload*

It is important to ensure when flipping the classroom that expectations of work to be completed pre- and in-class are made explicit to students early in the semester, and that consideration is taken of whether the changed format will increase that work.[45] While the video recordings and online reading materials were a few hours under the length of the replaced lectures and materials, the additional study questions did not entirely overlap with previous material and required about an extra three hours across the semester. The workshops themselves required 12 more hours across the semester. However, as the workshops supported assignment and exam preparation, we anticipated that the majority of the 12 hours (and any preparation time) would have been spent preparing for those assessment items in any event. Accordingly, the net effect on total study hours for students was broadly neutral.

4 *Lecturer perceptions*

Staff and institutional perceptions of adopting a flipped classroom may also be a key challenge,[46] especially where there is insufficient acknowledgment of the resources required.[47] In particular, the video-recording process can be difficult to master and time-

[42] Burns et al (n 20) 3–4.
[43] See, for example, Roy Ballantyne, John Bain **and** Jan Packer, 'Researching University Teaching in Australia: Themes and Issues in Academics' Reflections' (1999) 24(2) *Studies in Higher Education* 237, 243; Brett Freudenberg and Lisa Samarkovski, 'Enthusiasm and the Effective Modern Academic' (2014) 56(1) *Australian Universities Review* 22, 24–5.
[44] Burns et al (n 20) 3.
[45] Cf O'Flaherty and Phillips (n 21) 89.
[46] Carol Shepherd, Madelon Alpert and Marilyn Koeller, 'Increasing the Efficacy of Educators Teaching Online' (2007) 2 *International Journal of Social Science* 173, 173–4.
[47] O'Flaherty and Phillips (n 21) 89.

consuming.[48] The first time that lectures were recorded the lecturers in the unit each had multiple hours of dedicated assistance from our Educational Enhancement Unit to ensure that videos were of a sufficient quality and that recordings were made as efficiently as possible. Even so, it took around 2–2.5 hours of recording time per hour of lecture time. This time needs to be allocated well in advance so that the videos are recorded and available for students from the start of semester, or at least well in advance of the relevant module. Updates in subsequent years took slightly longer to record and then splice back into earlier recordings, so that a 5- to 10-minute update would require around 30 minutes. In most instances it would have been quicker to record an entirely new 10-minute recording than to splice 10 minutes into an existing 30-minute recording. Thus, in addition to aiming for 10- to 15-minute recordings to suit student attention spans, these shorter-length recordings can also aid updates.

5 *Group workshops*

As outlined in Section II.C, the workshops were run with the whole class, but split into around 25 groups. This potentially raises common risks associated with large-class teaching and group work, such as providing pastoral care for students, ensuring accountability, providing immediate feedback, designing group tasks that promote learning and team development, and ensuring optimal group formation and operation.[49] We aimed to reduce group tension and accountability issues (which may impact on relatedness with peers and teachers), as the group work was not assessed.[50] However, to ensure students remained motivated to prepare, the work was directly relevant to individual performance on future assessment tasks. This was assisted by the online transmission of information and initial short testing of student understanding. This measure ensured that students did not become unduly anxious about the performance of their fellow group members. Accountability for individual contributions to each group was also helped by the facilitators speaking multiple times with each group during workshops, something enabled only by the presence of volunteer tax practitioners.

The group workshop format of a flipped classroom can also require the development of new teaching skills.[51] For instance, teachers may have to select good and poor answers for discussion (assisted in our class by students first peer reviewing and rating the responses online), look for elements that may be missing in some answers, and sum up an overall answer to each question (all without the teacher having an opportunity to prepare beforehand). Furthermore, while exposure to poor answers carries with it the

[48] See, for example, ibid 85, 88–9; Burns et al (n 20) 5.

[49] See, for example, Larry Michaelsen and Michael Sweet, 'The Essential Elements of Team-Based Learning' (2008) 116 *New Directions for Teaching and Learning* 7; Felix Maringe and Nevensha Sing, 'Teaching Large Classes in an Increasingly Internationalising Higher Education Environment: Pedagogical, Quality and Equity Issues' (2014) 67 *Higher Education* 761.

[50] As to tensions that assessed group work can raise, along with strategies to deal with those tensions, see Linda Nilson, *Teaching at Its Best: A Research-Based Resource for College Instructors* (Jossey-Bass, 4th ed, 2016) 236–44; Charles Brooks and Janice Ammons, 'Free Riding in Group Projects and the Effects of Timing, Frequency and Specificity of Criteria in Peer Assessments' (2003) 78(5) *Journal of Education for Business* 268.

[51] Burns et al (n 20) 5; Shepherd, Alpert and Koeller (n 46) 3–4.

risk that students may become confused, this risk can be reduced by explaining how poor answers can be improved and taking students through a model answer to the question.[52]

It is also important to focus time on group formation, so as to increase diversity within groups and reduce pre-existing coalitions that are common when students select their own groups.[53]

IV METHODOLOGY

We employed an action research design to better understand how we could improve student satisfaction and engagement through shifting to a flipped classroom model. Action research attempts to capture the perspectives and behaviours of the participants (in this case, the students enrolled in the unit and the teachers), and analyse that data.[54] Occurring in a continuous feedback loop over the semesters, this enabled us to identify aspects of the learning and instructional design that required further work. Thus, we looked first to the existing teaching and learning literature and theory to identify dimensions in which to anticipate change in perspectives and behaviours (student perceptions; student engagement and motivation; student achievement; and teacher perceptions), before collecting data and considering how that data related to the identified dimensions. The approach adopted is particularly useful due to the deep understanding it can provide for the individual circumstances examined.[55] Its potential flexibility is a key benefit for exploratory research.[56] Given the emergent status of theoretical understandings of flipped classrooms, a methodological approach aligned with exploratory research is essential.

To gather the data, a mixed method approach was utilised. Mixed method research involves undertaking both qualitative and quantitative analysis.[57] To reduce research costs and safeguard student time, we analysed the rich data collected under our university's teaching quality assurance mechanism, the Students' Unit Reflective Feedback ('SURF'),[58] which contains quantitative and qualitative feedback. We also

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[52] As to the importance of providing feedback that explicitly addresses weaknesses and strengths, see, for example, Boris Handal, Leigh Wood and Michelle Muchatuta, 'Students' Expectations of Teaching: The Business, Accounting and Economics Experience' (2011) 5(1) *E-Journal of Business Education & Scholarship of Teaching* 1, 11–12.

[53] Michaelsen and Sweet (n 49) 7, 10.

[54] Keith F Punch, *Introduction to Social Research: Quantitative & Qualitative Approaches* (SAGE Publications, 2004) 143.

[55] Earl Babbie, *The Practice of Social Research* (Wadsworth Cengage, 12th ed, 2010) 296; Ariadne Vromen, 'Debating Methods: Rediscovering Qualitative Approaches' in David Marsh and Gerry Stoker (eds), *Theory and Methods in Political Science* (Palgrave Macmillan, 3rd ed, 2010) 249, 257.

[56] Babbie (n 55) 326; Vromen (n 55) 257.

[57] Cf Margaret McKerchar, 'Philosophical Paradigms, Inquiry Strategies and Knowledge Claims: Applying the Principles of Research Design and Conduct to Taxation' (2008) 6(1) *eJournal of Taxation Research* 5; R Burke Johnson, Anthony J Onwuegbuzie and Lisa Turner, 'Towards a Definition of Mixed Method Research' (2007) 1(2) *Journal of Mixed Method Research* 112, 113.

[58] The SURF is an electronic survey implemented through the online learning management system for every unit at UWA. It comprises six survey questions designed to ascertain the students' overall satisfaction with the educational experience. These are assessed on a four-point scale. Students also have space to provide qualitative feedback.

analysed assessment results and YouTube viewing data. Ethics approval was obtained from the university's Human Ethics Office for the use of this data.

In terms of the qualitative feedback, thematic coding was undertaken for the years 2013–18. The data was then triangulated to ensure consistency in the identification of themes.

V RESULTS AND DISCUSSION

In keeping with the description of this article's methodology, the results are discussed under the themes of student perceptions (Section V.A), student engagement and motivation (Section V.B), student achievement (Section V.C) and teacher perceptions (Section V.D).

A *Student perceptions*

As discussed in the literature review, there is a risk that students will view the change to a flipped classroom negatively. The SURF qualitative commentary reflected this risk:

> I strongly disliked the structure of this unit being mostly done through online modules. However, the lecturer is clear, concise and easy to understand so I must say that the lectures are good — but I wish that there were weekly in person lectures as I would then attend every week rather than leaving all the modules to the last 2 weeks to watch ... (2016 student)

> I would much rather prefer face-to-face lectures instead of learning through YouTube videos. Face to face lectures would allow the lecturer to engage with the students. This interaction would have provided a clearer indication of what the majority of students understood well and what they did not and then put more of a focus on concepts the majority of students did not understand as thoroughly. (2017 student)

However, student satisfaction with the unit improved dramatically following the flip, as captured in the SURF survey results for the statement: 'Overall, this unit was a good educational experience' (see Table 2).

Table 2: Student perception of educational experience

Year	2013	2014	2015	2016	2017	2018
Score out of 4[59]	2.5 (36.6% response rate)	2.6 (25.8% response rate)	2.7 (38.5% response rate)	3.4 (62% response rate)	3.2 (29.3% response rate)	3.5 (26.5% response rate)

The qualitative analysis also indicated that student satisfaction was enhanced under the flipped classroom. Many students provided SURF comments that reflected a positive view of the change, with positive statements exceeding or equalling negative statements in

[59] The mid-point of the scale is 2.5 (Strongly disagree = 1, Disagree = 2, Agree = 3, Strongly agree = 4) and the university expectation is that a large core unit should score around 3.2.

each year following the flip and, overall for 2016–18, exceeding negative statements 55 per cent to 45 per cent. For instance:

> The current structure of the online modules with a face to face workshops have worked out really well. The assignment given was very indicative of my performance at the time and it helped me fix specific areas I was lacking and was more confident in my learning by the exam ... (2016 student)

> The online videos were really helpful. The lecturers and tutors were really kind and extremely helpful. The workshops worked really well and gave us a good guide to prep for exams and for the assignment. (2018 student)

Several themes emerged from the qualitative SURF data, which shed light on these perceptions. The first theme was an increased sense of pastoral care, which is consistent with Comber and Brady-Van den Bos' findings of an improved teacher/student dynamic in flipped classrooms.[60] For example, post the flip, in addition to the final quote set out immediately above, some of the feedback indicated:

> It is obvious that [the lecturer] cares about how his students perform, as evident by his willingness to help with mock answers before the exam and adjusting to students feedback frequently. One of my favourite units so far. (2017 student)

> Greatly structured unit. Initially I thought the unit would be monotonous but the interest and clarity shown by [lecturer A] and [lecturer B], as well as my tutor led to a solid educational experience. (2018 student)

> The lecturers and tutors were really kind and extremely helpful. The workshops worked really well and gave us a good guide to prep for exams and for the assignment. (2018 student)

Likewise, the qualitative analysis highlights that, before flipping, student comments reflected a concern that there was limited recognition of student desire/need for a flexible learning structure. For example:

> I hated the fact that there were so many problems with lectures and the fact that the lecturer made me feel bad for preferring to watch the lecture online rather than attend the lecture. (2015 student)

> Unit coordinator expressed that he wanted us to attend lectures however not everyone can do this due to part time jobs and some prefer to watch lectures online as they can be paused and more easily understood. Not everyone has the luxury of attending uni without having to work. We, the students are they [sic] ones paying to attend uni. (2015 student)

After the flip there was limited focus on a desire for flexibility, suggesting that students felt that the flipped classroom was delivering the flexibility they needed:

> Really enjoyed the online modules, as it meant you could learn at your own pace, and also made it easier to go back and revise certain aspects of a week's content that needed revising, without having to sift through the entire lecture. Information was given

[60] See Comber and Brady-Van den Bos (n 14) and accompanying text.

> concisely which made it easier to learn the required content. Workshops and provision of regular practice exams was useful for consolidating our knowledge of the topics. Overall I enjoyed this unit, and the way it was structured made it all the more enjoyable. (2016 student)
>
> The structure of the unit was really well designed with the modules being helpful in learning at my own pace. Workshops were great as well with the added help of going through content and doing an assignment review. (2016 student)
>
> Learning modules were very helpful, particularly the ability to easily pause to take notes and rewatch certain ones. They were very to the point, which I appreciated. Posting all the tutorials as early as possible was also very helpful, gave plenty of time to prepare … (2016 student)
>
> The online lectures were great, as I worked extremely long hours during the week at my employment, and watching online was an easy way to cut out travel time to and from university. (2017 student)

Notably, there was a close connection between the perception of pastoral care and flexible learning design. This indicated that students considered the provision of flexibility in the learning design to be a response by the lecturers to their needs and pressures.

B *Student engagement and motivation*

While attendance (or absenteeism) may occur for a range of reasons, attendance is a potentially important indicator of student motivation and 'behavioural engagement'.[61] Based on lecturer estimates of attendance and reflecting the literature on flipped classrooms,[62] there was a dramatic increase from before to after flipping the classroom. This is consistent with the observations of Butt, who also found a dramatic improvement in class attendance following the implementation of a flipped classroom.[63]

Table 3: Student attendance

Attendance	**2013**		**2014**		**2015**		**2016** Workshops	**2017** Workshops	**2018** Workshops[64]
	First and final lectures	Other lectures	First and final lectures	Other lectures	First and final lectures	Other lectures			
Approximate head count as percentage of enrolled students	65%	20–30%	45%	15–20%	15–25%	10–15%	55–70%	50–65%	50–70%

[61] Cf Jennifer Fredricks, Phyllis Blumenfeld and Alison Paris, 'School Engagement: Potential of the Concept, State of the Evidence' (2004) 74(1) *Review of Educational Research* 59, 60; Sarah Moore, Claire Armstrong and Jill Pearson, 'Lecture Absenteeism among Students in Higher Education: A Valuable Route to Understanding Student Motivation' (2008) 30(1) *Journal of Higher Education Policy and Management* 15. 'Behavioural engagement' reflecting 'participation', that is, taking part in academic and class activities.

[62] For a meta-analysis, see O'Flaherty and Phillips (n 21) 89.

[63] Butt (n 35) 40.

[64] Excluding workshop 5, which was held just before the due date for an assignment in the unit, and for which the attendance was a little over 10 per cent.

One potential factor underlying this increased attendance is that lectures had previously been recorded, but the replacement workshops, due to their interactive nature, were not recorded. This is unlikely, however, to be a complete explanation. In 2015, in particular, there were numerous problems, of which students were aware, in obtaining lecture recordings, but no obvious increase in lecture attendance. For instance, a representative student SURF comment for 2015 noted:

> The coordinator seems to expect all student to attend lectures, lecture recordings are too poor (failure to use microphone). Coordinator should be considerate of student's personal circumstances that may limit their ability to attend lectures.

Further, students who attended workshops generally appeared to the teachers and facilitators to have completed the out-of-class preparatory activities and materials. While statistics for unique views of the recorded lectures were not captured, the existing statistics are that recordings were viewed between a minimum of 85[65] and a maximum of 361 times per year across 2017 and 2018 — with only three videos watched fewer than 140 times per year in that time.[66] As the class size was around 140–150 students over each of these years, it suggests that most students watched most of the videos, although some students may have watched videos multiple times.

Student SURF comments also reflected changes in some factors that would be expected to improve engagement and motivation. As discussed in Section V.A, the SURF comments suggest increased student perceptions of pastoral care and access to flexibility. The former should typically lead to improved 'emotional engagement', as well as relatedness and hence motivation, given that it involves more positive perceptions of teaching staff.[67] The latter indicates a perceived improvement in autonomy and hence motivation and 'cognitive engagement'.[68]

However, SURF comments also indicated some negative impacts on student engagement and motivation. In particular, we underestimated the continued student desire for a more prescriptive narrative and greater reinforcement in lecture materials. This was to the detriment of emotional and cognitive engagement and motivation, which was a key theme from SURF comments before and after the classroom was flipped. For example:

> I found much of this unit vague and it felt like I was trying to learn street names without a road map to understand how that was relevant … I understand the desire to engage students by posing questions rather than having slides filled with sections and cases, but I have found it difficult to be sure I have gone back and covered each topic comprehensively without missing some aspect of a topic. Perhaps some summary notes released after lectures would be helpful for revision. (2014 student)

> Whilst I found the module layout of the unit (weekly online videos) to be excellent compared to lectures, the accompanying slides and the videos themselves were severely

[65] In the case of at least one of these videos, the students were told that the material was not examinable.
[66] Obtained from YouTube analytics, which exist for 2017 and 2018, but not 2016.
[67] 'Emotional engagement' concerns 'positive and negative reactions to teachers, classmates, academics, and school and is presumed to create ties to an institution and influence willingness to do the work': Fredricks, Blumenfeld and Paris (n 61) 60.
[68] 'Cognitive engagement' concerns 'willingness to exert the effort necessary to comprehend complex ideas and master difficult skills': ibid.

> inadequate in assisting my understanding of the unit content. … Though I understand slides should only form a skeleton to accompany the body of a lecture, the notes provided in this unit covered the absolute minimum and it was very easy to miss key points. (2018 student)

A greater quantity of material was available to students once the classroom had been flipped, as students were also provided with test questions and answers for each module, as well as the workshop materials. However, SURF comments indicate that students continued to want lecture notes for each lecture rather than just video recordings or textbook readings. Further, after the flip, there were also more SURF comments requesting a greater emphasis on ensuring a seamless connection between the course materials. For instance:

> Strong disconnect between lecture slides, required readings and tutorial exercises. (2016 student)

> Some of the modules did not flow well when there was a change in presenter from video to video, I would have preferred to have the same presenter for the whole module. Otherwise the unit was great, modules and readings were very helpful. (2018 student)

This suggests that a flipped classroom may increase student desire for greater narrative prescription, as a flipped classroom potentially involves a greater range of materials (with more guidance thus required on the interaction of those materials) and potentially less emphasis on the teacher's description of the tax rules, since the in-class emphasis is on applying those rules, not setting them out. This is potentially consistent with Butt's insight that students still need a range of different learning opportunities, which may include short re-caps delivered in workshops or recorded for viewing before workshops.[69] It is also consistent with the discussion of cognitive load theory, in that extraneous cognitive load may be increased by too much divergence in materials.

In 2017 and 2018 we trialled a response to student requests for lecture notes by providing tidied-up copies of the lecturers' personal notes for several of the trickier topics and the SURF comments have generally been positive about access to those notes:

> Addition of lecture notes on top of lecture slides were great learning resources. (2017 student)

However, the provision of a further set of materials makes the task of ensuring a seamless connection between the various materials harder.

SURF comments also suggest that student engagement and motivation was negatively affected in the first year of the flipped classroom by reason of significant differences in the length of video recordings for different modules. In particular, we had one module for ordinary income, which comprised multiple videos totalling 3.5 hours, and two separate modules covering GST and FBT, each of which consisted of multiple videos of around one hour in combined length.

> The modules were too long for some whilst others were short. Some of the content was too long as well. (2016 student)

[69] See above n 42 and accompanying text.

> Learning modules should be around the same length every week, not have some modules being extremely long and tedious whilst others only span for 10 minutes. Students should be able to devote the same amount of time each week to learning modules but if some modules take longer than others, it makes it difficult to keep up and stay on top of the unit. (2016 student)

We subsequently split the ordinary income module in two and combined FBT and GST, achieving greater consistency in total length of videos for each module, and there were no SURF comments in 2017 and 2018 focusing on divergent module lengths.

C *Student achievement*

There is some flipped classroom literature suggesting that learning, and hence student achievement, should be improved.[70] However, this is equivocal, and a study by Findlay-Thompson and Mombourquette questions whether flipped classrooms result in improved student grades.[71] Cognitive load theory suggests that where students can control the pace at which information is delivered, the cognitive load should be reduced and so learning should improve.[72] While we identified above several ways in which we need to better segment the recorded material, the flipped classroom still involved a broader range of online material that students could access at their own pace. In addition, there is a significant body of literature suggesting that active learning (anticipated to increase in a flipped classroom) improves student achievement and this was a second reason for expecting improved student performance on assessment tasks.[73]

Table 4 sets out the percentage of students achieving high distinction ('HD'), distinction ('D'), credit ('C'), pass ('P') and fail ('F') overall grades for the unit from 2013 to 2018. The years are broadly comparable, although 2014 evidences a much higher percentage of Cs and a lower number of HDs than other years, while 2013 and 2018 both reflect far fewer F grades. The means for the overall percentage grades each year are set out in Table 5, but before considering the means, it is pertinent to note that there has been far more consistency in the style and format of assessment from 2015 to 2018, during which members of the current teaching team have had primary responsibility for setting and grading assessment. By way of example of one difference in style, the 2014 final exam contained two questions with a combined total of nine sub-questions, while the 2015 exam contained two questions with four sub-questions, permitting more in-depth analysis for each issue.

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[70] Cf O'Flaherty and Phillips (n 21) 89.

[71] Sandi Findlay-Thompson and Peter Mombourquette, 'Evaluation of a Flipped Classroom in an Undergraduate Business Course' (2014) 6(1) *Business Education & Accreditation* 63.

[72] See, for example, Abeysekera and Dawson (n 1) 8–9.

[73] Michelle J Richardson, Charles Abraham and Rod Bond, 'Psychological Correlates of University Students' Academic Performance: A Systematic Review and Meta-analysis' (2012) 138(2) *Psychological Bulletin* 353, 368, 372–3. Albeit, a range of other factors have a larger influence.

Table 4: Student grades — percentage and number of students

Final grade[74]	2013 (122)	2014 (190)	2015 (177)	2016 (133)	2017 (156)	2018 (146)
HD ≥80%	10.7% (13)	1.6% (3)	7.3% (13)	9.8% (13)	14.1% (22)	9.6% (14)
D ≥70%	29.5% (36)	26.8% (51)	29.9% (53)	38.3% (51)	29.5% (46)	32.2% (47)
C ≥60%	37.7% (46)	54.7% (104)	31.6% (56)	31.6% (42)	32.1% (50)	35.6% (52)
P ≥50%	19.7% (24)	9.5% (18)	21.5% (38)	12.8% (17)	14.7% (23)	17.8% (26)
F <50%	2.4% (3)	7.4% (14)	9.6% (17)	7.5% (10)	9.6% (15)[75]	4.8% (7)

Table 5: Student results — mean grade and standard deviation

	2013	2014	2015	2016	2017	2018
Mean grade (%)	66.4	63.6	62.6	65.6	64.9	65.4
Std dev	9.54	10.78	13.33	13.55	15.04	12.57
Number of students	122	190	177	133	156	147

We have applied Student's t-test to compare the means for 2013–15 (combined) and for 2016–18 (combined), to test the hypotheses that the means for the two groups were the same or, alternatively, that the mean for the 2016–18 group was significantly larger than that for the 2013–15 group.[76] As there were teaching improvements made for 2015, we have likewise compared the 2015 mean with that for 2016–18.

The comparison of the 2015 mean against 2016–18 indicated that there is a significant difference between the means and that the 2016–18 mean is significantly larger than the 2015 mean, as shown in Table 6.

Table 6: T-test for 2015 versus 2016–18

	2015	2016–18
Mean grade (%)	62.6	65.3
Std dev	13.33	13.77
Number of students	177	435
p (one-tail)		0.013
t		-2.25
t critical one-tail		1.65

However, we should be cautious about inferring too much from this result, as Table 7 demonstrates that, when we look at the larger range of data, there is no significant difference between the 2013–15 and 2016–18 means.[77] As noted above, while there are

[74] Excluding students who withdrew, did not undertake any assessment or sat deferred exams.
[75] Most of these fails were students who only completed one item of assessment.
[76] See, for example, Alan Elliot and Wayne Woodward, *Statistical Analysis Quick Reference Guidebook* (Sage, 2007). As an F-test indicated that the variances for the 2013–15 set and the 2016–18 set were unequal, the t-test was applied assuming unequal variance.
[77] The p-value is greater than 0.05 and the t-value lies between –t critical one-tail and +t critical one-tail, both of which indicate no significant difference, at the 95% confidence level. In any event, we note that grades are not the sole indicator of student learning and thus academic success, but rather an aspect of a

reasons to expect the 2015 data to differ from that for 2013–14, and hence to compare 2015 with the post-flip years, the reasons for treating 2015 differently also suggest that the mean should have been higher in 2015, when in fact that was not the case.

Table 7: T-test for 2013–15 versus 2016–18

	2013–15	**2016–18**
Mean grade (%)	63.9	65.3
Std dev	11.57	13.77
Number of students	489	435
p (one-tail)		0.054
t		-1.61
t critical one-tail		1.65

D *Teacher perceptions*

A further important factor in assessing the results of implementing a flipped classroom is considering how the change of delivery impacts the lecturers' perceptions. To ascertain this, the three unit lecturers debriefed on their experience with the flipped classroom. Two of the lecturers had been involved in the unit both pre- and post-flip, and were instrumental to the change in delivery mode. The third lecturer became involved only after the flip. However, this lecturer was able to reflect upon their experience in other similar tertiary units that used the traditional didactic lecture format as a point of comparison.

There were four main themes arising from the reflections, three of them being an increase in lecturer satisfaction due to:[78]

- enhanced interactions with students through greater attendance and engagement at workshops
- the reduced need for out-of-class one-on-one feedback on assessment tasks due to the workshop design[79]
- the development of teaching skills in relation to providing real-time feedback, flexibility in content discussion so as to tailor in-class time to areas of student need, and the recording of YouTube clips.

An increase in lecturer satisfaction and enthusiasm is not just a personal matter, but has also been linked to effectiveness in teaching.[80] The lecturers indicated that the flipped classroom model of delivery was more motivating due to the significant increase in student attendance at workshops. Increased student attendance had a number of advantages. First, it allowed a greater number of groups (and participants within each

number of variables, which include persistence, acquisition of skills and competencies, attainment of learning outcomes, career success, satisfaction and academic achievement. Cf 'Revised Conceptual Model of Academic Success' in Travis T York, Charles Gibson and Susan Rankin, 'Defining and Measuring Academic Success' (2015) 20(5) *Practical Assessment, Research & Evaluation* 1.

[78] Burns et al (n 20) 4.

[79] Debora L Threedy and Aaron Dewald, 'Re-conceptualizing Doctrinal Teaching: Blending Online Videos with In-Class Problem-Solving' (2015) 64 *Journal of Legal Education* 613.

[80] See, for example, Freudenberg and Samarkovski (n 43) 23.

group) in workshops, which ensured more diverse opinions and perspectives being canvassed and a more dynamic environment in the lecture room.[81] One area for improvement in future is for greater attention to group formation, as recommended by Michaelsen and Sweet in the literature review discussion.

Second, similar to the experiences of Cameron and Dickfos,[82] it provided the lecturers with enhanced opportunities to get to know and meaningfully interact with a larger number of the student cohort. The structure of the workshops also provided a platform that enabled more focused interactions between lecturers and students. It seems likely that the enhanced student perception of pastoral care discussed above resulted in greater emotional engagement, further supporting interactions with lecturers. The lecturers also found it satisfying to see the students interact in groups, building their 'peer to peer relatedness', as well as observing them interacting with members of the profession. Indeed, the SURF comments indicate that these professional volunteers were key to maintaining a sense of pastoral care in the large workshops:

> The unit is exceptionally well structured. The use of online learning modules to allow the facilitation of the interactive workshops has added to the knowledge base I have developed with regard to the unit. The assistance and knowledge provided by the PWC staff [in workshops] has been fantastic as well as adding a real word [sic] approach to the workshop questions. (2016 student)

The workshops provided a valuable mechanism for giving formative feedback before the assignment or exam. This allowed students to seek early feedback and gave them an incentive to prepare earlier. A flow-on effect was that students were more prepared for their assignment and better understood why certain grades were awarded, resulting in fewer individual queries to the lecturer about the format, substance or design of the assignment. As a result of a workshop being set specifically on the assignment, the students also had the opportunity to discuss with their peers any concerns they may have had. As discussed above, there is weak evidence of a modest improvement in student grades. That said, consistent with the observations of Butt, it was necessary to exercise care during the workshops to ensure an appropriate balance between active classroom activities and clarification or explanation by teachers.[83]

Third, as outlined in the literature review, the workshops required the lecturers to develop new skills in giving instant feedback on written answers posted to the discussion board during the workshop and in addressing good and poor answers. Additionally, certain workshops assisted in the identification of unforeseen widespread misunderstandings of particular content that could then be addressed. However, this necessitated the lecturer being flexible. For example, one workshop session revealed that a number of students had misunderstood the ratio of *FCT v Stone*.[84] Whilst this was not the purpose of the workshop, unearthing this issue enabled the lecturers to discuss and

[81] As to the benefits of diversity within groups, see above n 54 and accompanying text.
[82] Cameron and Dickfos (n 5) 112.
[83] Butt (n 35).
[84] (2005) 222 CLR 289.

clarify the impact of this decision. It is unlikely that, without the workshop environment and the type of application question that was set, this issue would have been uncovered.[85]

The literature review also emphasised the importance of responding with sufficient guidance in the case of poor answers. For some workshops, we posted full workshop answers online, but were concerned that if this became expected students might not attend workshops but just read the answers. Workshop questions were also typically framed as relatively short discrete issues that involved some tax uncertainty on the specific issue, so there was room for debate within groups, but the output was short and could be typed and posted onto the discussion board during the workshops. Thus, guidance on how to improve poor answers could be provided in relatively swift and discrete portions.

The fourth theme was the lecturers' experience of mild staff and institutional resistance to the adoption of a flipped classroom and its workload implications. At the time, the university's workload policies were not well suited to non-traditional modes of teaching. The unit coordinators had to explain the underlying pedagogy justifying the unit changes in order to make a case for the flipped classroom model and workload recognition. This reflects the risk identified in the literature of insufficient acknowledgment of resourcing.[86] In particular, an initial concern was that, once the content for the unit was captured and placed on Blackboard, there would be limited workload recognition in subsequent years, as 13 weeks of lectures (26 face-to-face teaching hours) had been replaced by 6 weeks of workshops (12 face-to-face teaching hours). It took several discussions before the university settled on an approach of providing the same workload credit for the flipped unit as had been provided for the traditional delivery mode. We consider this is the minimum level of recognition that ought to be accorded. The transition process of planning and recording lectures for the first time took substantially longer than 13 weeks — two to three times longer. On top, there is the need to develop and deliver in-class workshops.

Our experience has been that, for the first year, workload increased, while in subsequent years workload ended up about the same as for traditional lectures. This is consistent with the experiences of Butt, who also observed that the implementation of a flipped classroom involves an increase in preparation time the first time it is taught.[87] However, contrary to Butt, we did not necessarily observe an overall decrease in time spent updating the unit in subsequent years.[88] This might be explained, in part, by the constantly changing area of taxation law, which necessitates yearly updates to course materials, video recordings and workshop content.

VI CONCLUSION

Self-determination theory and cognitive load theory suggest that flipping the classroom can reflect better pedagogy than the traditional in-class lecture. This is particularly due to increasing student engagement and motivation through greater autonomy,

[85] Cf Burns et al (n 20) 4.
[86] See above n 48 and accompanying text.
[87] Butt (n 35) 41.
[88] Ibid.

competence and relatedness, and by increasing student control over learning, as well as by promoting more active learning. We found evidence of improved student engagement and motivation through higher attendance rates. SURF comments also provided qualitative support for enhanced relatedness, evidenced by the increased perception of pastoral care in the flipped classroom; and for student autonomy due to the flexible access to unit materials. However, competence remained a challenge, as illustrated by SURF comments about student desire for a more cohesive narrative and more prescriptive course materials.

We also found that the act of flipping itself enhanced student perceptions of pastoral care, as students felt that past student concerns had been heard. In addition, we found the teaching experience far more enjoyable, as it involved greater interaction with students and the development of new skills. Thus, in-class attendance tripled and student satisfaction soared from equally satisfied/dissatisfied to overwhelmingly satisfied. There was some evidence of an improvement in results, but caution should be exercised until further years of data are collected.

However, while our experience was positive overall, there were a number of risks and challenges. Material care needs to be taken to ensure that the method of flipping the classroom provides sufficient support for developing relatedness and competence (autonomy generally being improved under most methods). Scaffolding for these dimensions also ties in to student feedback about the need for a more prescriptive and cohesive narrative embedded in teaching materials. Additionally, flipping itself poses a risk for student perceptions, since flipped classrooms are often a relatively novel experience. Likewise, the novelty raises institutional dangers around workload, as well as teacher capacity risks relating to the skills, time and additional workshop facilitators required to record material and run workshops. Careful planning is needed to address these potential risks. In this vein, we will continue to develop our flipped unit, especially in relation to group formation and diversity, and in ensuring that there is greater prescription and reinforcement in teaching materials.

REFERENCES

A *Articles/Books/Reports*

Abeysekera, Lakmal and Phillip Dawson, 'Motivation and Cognitive Load in the Flipped Classroom: Definition, Rationale, and a Call for Research' (2015) 34(1) *Higher Education Research & Development* 3

Andrews, T, M Leonard, C Colgrove and S Kalinowski, 'Active Learning Not Associated with Student Learning in a Random Sample of College Biology Courses' (2011) 10(4) *CBE Life Sciences Education* 394

Babbie, Earl, *The Practice of Social Research* (Wadsworth Cengage, 12th ed, 2010)

Brooks, Charles and Janice Ammons, 'Free Riding in Group Projects and the Effects of Timing, Frequency and Specificity of Criteria in Peer Assessments' (2003) 78(5) *Journal of Education for Business* 268

Burke, Alison S and Brian Fedorek, 'Does "Flipping" Promote Engagement?: A Comparison of a Traditional, Online, and Flipped Class' (2017) 18 *Active Learning in Higher Education* 11

Burke, Debra D, 'Scale-Up! Classroom Design and Use Can Facilitate Learning' (2015) 49 *The Law Teacher* 189

Burke Johnson, R, Anthony J Onwuegbuzie and Lisa Turner, 'Towards a Definition of Mixed Method Research' (2007) 1(2) *Journal of Mixed Method Research* 112

Burns, Kylie et al, 'Active Learning in Law by Flipping the Classroom: An Enquiry into Effectiveness and Engagement' (2017) 27(1) *Legal Education Review* 1

Butt, Adam, 'Students Views on the Use of a Flipped Classroom Approach: Evidence from Australia' (2014) 6(1) *Business Education & Accreditation* 33

Cameron, Craig and Jennifer Dickfos, 'Peer Review of Teaching Law to Business Students in Traditional and Flipped Lecture Environments' in Christopher Klopper and Steve Drew (eds), *Teaching for Learning and Learning for Teaching* (Sense Publishers, 2015) 99

Comber, Darren PM and Mirjam Brady-Van den Bos, 'Too Much, Too Soon? A Critical Investigation into Factors that Make Flipped Classrooms Effective' (2018) 37(4) *Higher Education Research & Development* 685

Creswell, John, *Qualitative Inquiry & Research Design* (Sage, 3rd ed, 2013)

Deci, Edward and Richard Ryan, *Intrinsic Motivation and Self-Determination in Human Behaviour* (Plenum Press, 1985)

DeLozier, Sarah J and Matthew G Rhodes, 'Flipped Classrooms: A Review of Key Ideas and Recommendations for Practice' (2017) 29 *Educational Psychology Review* 141

Elliot, Alan and Wayne Woodward, *Statistical Analysis Quick Reference Guidebook* (Sage, 2007)

Findlay-Thompson, Sandi and Peter Mombourquette, 'Evaluation of a Flipped Classroom in an Undergraduate Business Course' (2014) 6(1) *Business Education & Accreditation* 63

Fredricks, Jennifer, Phyllis Blumenfeld and Alison Paris, 'School Engagement: Potential of the Concept, State of the Evidence' (2004) 74(1) *Review of Educational Research* 59

Gagne, Marylene and Edward Deci, 'Self-Determination Theory and Work Motivation' (2005) 26 *Journal of Organizational Behaviour* 331

Ginns, Paul, 'Meta-Analysis of the Modality Effect' (2005) 15(4) *Learning and Instruction* 313

Johnstone, Richard, 'Rethinking the Teaching of Law' (1992) 3(1) *Legal Education Review* 1

Keyes, Mary and Richard Johnstone, 'Changing Legal Education: Rhetoric, Reality and Prospects for the Future' (2004) 26 *Sydney Law Review* 537

Kim, Min Kyu, So Mi Kim, Otto Khera and Joan Getman, 'The Experience of Three Flipped Classrooms in an Urban University: An Exploration of Design Principles' (2014) 22 *Internet and Higher Education* 42

Le Brun, Marlene and Richard Johnstone, *The Quiet (R)evolution: Improving Student Learning in Law* (Law Book Company, 1994)

Maringe, Felix and Nevensha Sing, 'Teaching Large Classes in an Increasingly Internationalising Higher Education Environment: Pedagogical, Quality and Equity Issues' (2014) 67 *Higher Education* 761

Mason, Gregory S, Teodora Rutar Shuman and Kathleen E Cook, 'Comparing the Effectiveness of an Inverted Classroom to a Traditional Classroom in an Upper-Division Engineering Course' (2013) 56(4) *IEEE Transactions on Education*

McKerchar, Margaret, 'Philosophical Paradigms, Inquiry Strategies and Knowledge Claims: Applying the Principles of Research Design and Conduct to Taxation' (2008) 6(1) *eJournal of Taxation Research* 5

Michaelsen, Larry and Michael Sweet, 'The Essential Elements of Team-Based Learning' (2008) 116 *New Directions for Teaching and Learning* 7

Moore, Sarah, Claire Armstrong and Jill Pearson, 'Lecture Absenteeism among Students in Higher Education: A Valuable Route to Understanding Student Motivation' (2008) 30(1) *Journal of Higher Education Policy and Management* 15

Mullins, Anne E, 'The Flipped Classroom: Fad or Innovation?' (2015) 92 *Oregon Law Review Online* 27

Nilson, Linda, *Teaching at Its Best: A Research-Based Resource for College Instructors* (Jossey-Bass, 4th ed, 2016)

O'Flaherty, Jacqueline and Craig Phillips, 'The Use of Flipped Classrooms in Higher Education: A Scoping Review' (2015) 25 *Internet and Higher Education* 85

Owston, Ron, Denys Lupshenyuk and Herb Wideman, 'Lecture Capture in Large Undergraduate Classes: Student Perceptions and Academic Performance' (2011) 14(4) *Internet and Higher Education* 262

Punch, Keith F, *Introduction to Social Research: Quantitative & Qualitative Approaches* (SAGE Publications, 2004)

Richardson, Michelle J, Charles Abraham and Rod Bond, 'Psychological Correlates of University Students' Academic Performance: A Systematic Review and Meta-analysis' (2012) 138(2) *Psychological Bulletin* 353

Seufert, Tina, 'The Interplay between Self-Regulation in Learning and Cognitive Load' (2018) 24 *Educational Research Review* 117

Shepherd, Carol, Madelon Alpert and Marilyn Koeller, 'Increasing the Efficacy of Educators Teaching Online' (2007) 2 *International Journal of Social Science* 173

Shi, Elizabeth, Paul Myers and Freeman Zhong, 'Interteaching: An Alternative Format of Instruction for Law Classes' (2018) 11 *Journal of the Australasian Law Teachers Association* 58

Sweller, John, 'Cognitive Load Theory' in Jose P Mestre and Brian H Ross (eds), *The Psychology of Learning and Motivation* (Elsevier, 2011) vol 55, 38

Threedy, Debora L and Aaron Dewald, 'Re-conceptualizing Doctrinal Teaching: Blending Online Videos with In-Class Problem-Solving' (2015) 64 *Journal of Legal Education* 605

Tucker, Bill, 'The Flipped Classroom: Online Instruction at Home Frees Class Time for Learning' (2012) 12(1) *Education Next* 82

York, Travis T, Charles Gibson and Susan Rankin, 'Defining and Measuring Academic Success' (2015) 20(5) *Practical Assessment, Research & Evaluation* 1

B *Cases*

FCT v Stone (2005) 222 CLR 289