



Rosemary Fisher, Swinburne UNIVERSITY OF TECHNOLOGY, rlfisher@swin.edu.au
Bella Ross, MONASH UNIVERSITY, bella.ross@monash.edu.au
Richard LaFerriere, SWINBURNE UNIVERSITY OF TECHNOLOGY, rlaferriere@swin.edu.au
Alex Maritz, LATROBE UNIVERSITY, a.maritz@latrobe.edu.au

Flipped Learning, Flipped Satisfaction, Getting the Balance Right

ABSTRACT

This paper explores students' perceptions of their learning outcomes, engagement, and satisfaction with a technology-facilitated flipped approach in a third-year core subject at an Australian university during 2014. In this pilot study, findings reveal that students preferred the flipped approach to the traditional face-to-face delivery and reported increased engagement, satisfaction, and learning outcomes as a result of both the flipped classroom approach and the use of digital technologies in the delivery of the unit. However, students did report frustration and less satisfaction generally with the flipped model in the initial stages of the semester. The implications are that students may require extra support in the initial stages of delivery of a flipped class to assist them to understand and take up the challenge of the approach, thereby maximising student engagement and satisfaction earlier in the semester.

KEYWORDS

flipped learning, perceptions, learning outcomes, engagement, satisfaction, blended learning

INTRODUCTION

Higher education around the globe is facing transformative change driven in large part by technology. Flexibility of delivery has become a focus for students (Henderson, Selwyn, & Aston, 2015), as an increasingly diverse cohort of students are challenged by the competing demands of work, family, and society and are seeking more flexible learning options (Te Riele, 2014). Furthermore, research in Australia, Canada, the United Kingdom, and the United States shows that undergraduate students are spending more time working while completing their studies for two primary reasons: financial support and to better prepare themselves for competitive career opportunities (Australian Bureau of Statistics, 2013; Canadian Federation of Students, 2013; Citi Group & Seventeen, 2013; Endsleigh & National Union of Students, 2015). Around the world universities are challenged by both increased resource constraints and competition for enrolments. Accordingly, improving the student learning experience in an efficient and cost-effective manner is recognised as fundamental to the survival, growth, or success of universities (Salmon & Angood, 2013). The rise in flipped classrooms and modes of blended learning (O'Flaherty & Phillips, 2015) may be able to address the financial pressures associated with the provision of infrastructure for teaching (Baepler, Walker, & Driessen, 2014) whilst being an appealing form of learning to prospective students.

Digital technologies are a potential disruptive innovation to the business models of traditional education providers (Christensen, 2002). However, they also present an opportunity for educators to “disrupt themselves” by leveraging the technologies to create, embrace, and adopt innovations in pedagogy and delivery modes (Higgitt, 2014), and can be used to overcome distance, location, and physical existence barriers to education (Tham & Werner, 2005). Notwithstanding that flipped classrooms do not take full advantage of all of the affordances digital technologies offer, the digital technology facilitated flipped classroom offers a tantalising means to address some of the challenges faced by both institutions and students (Abeysekera & Dawson, 2015; Baepler, Walker, & Driessen, 2014; Johnson, 2007; Kristjanson, 2013; O’Flaherty & Phillips, 2015) whilst concurrently stimulating transformative innovation in pedagogy (Garrison & Kanuka, 2004).

The aim of any teaching innovation should be to facilitate effective teaching and learning, often indicated by levels of student engagement, satisfaction, and learning outcomes. Yet studies of flipped classrooms have shown mixed results in terms of student engagement and satisfaction (Davies, Dean, & Ball, 2013). In this increasingly competitive landscape for university enrolments, indicators of student satisfaction are rising in importance (Carbone, et al., 2015) and whilst student engagement is critical for learning (Barkley, 2010; Coates, 2006), student satisfaction may not be an accurate indicator of achievement of learning outcomes (Carbone, et al., 2015; Colvin Clark, 2015).

Accordingly, recent studies have called for further research into the effectiveness of the flipped classroom approach (Abeysekera & Dawson, 2015; Missildine, Fountain, Summers, & Gosselin, 2013). Therefore, this pilot study aims to establish an initial understanding of the value to students of these pedagogies by investigating the students’ perception of their levels of engagement, satisfaction, and learning outcomes in a flipped undergraduate class utilising digital technologies. Further research, building on the insights and results from this research, has since been undertaken and will be the subject of separate reporting.

The research question guiding this study is as follows: ***do students perceive they have achieved a good level of student engagement, satisfaction, and learning outcomes in a flipped classroom utilizing digital technologies?*** Students in this research reported high levels of engagement, satisfaction, and learning outcomes but also experienced confusion in the early stages of a flipped unit. Furthermore, a key finding is that flipped classrooms leave some students exposed in their (lack of) study and preparation habits. Our assessment is that flipped classrooms, like more traditional models of teaching and learning, better suit some students than others and implementing flipped classrooms utilising digital technologies involves up-skilling students in learning behaviours that suit this new learning environment.

Our paper proceeds with a brief review of the literature on flipped learning. We then present our methodology. Results are presented in four parts covering the areas of student engagement, student satisfaction, learning outcomes, and challenges faced in the flipped classroom. We conclude the paper with a discussion of the main findings, research limitations, and further research opportunities.

LITERATURE REVIEW

Flipped learning is a relatively new phenomenon and, despite the proliferation of the term, the approach of the flipped classroom is considered by some as under-researched (Abeysekera & Dawson, 2015). For a comprehensive overview of recent research studies in this area, see O’Flaherty & Phillips (2015). The flipped classroom can be defined as a set of pedagogical approaches that (Abeysekera & Dawson, 2015) do the following:

1. move most information-transmission teaching out of class;
2. use class time for learning activities that are active and social, and
3. require students to complete pre- and/or post-class activities to fully benefit from in-class work.

Moving the passive learning activities of students out of the classroom allows the subsequent class time to be used for further collaborative exploration of the instructional material and shifts the focus of attention from the teacher to the student (Chen, Wang, Kinshuk, & Chen, 2014). When combined with mobile and blended learning technologies, flipped learning has been shown to support increased learning (Arnold-Garza, 2014; Enfield, 2013; Findlay-Thompson & Mombourquette, 2014; Ruddick, 2012), increased learner independence and control, and acceptance of responsibility for learning (Garrison & Kanuka, 2004). Flipped learning has also been linked to increased student satisfaction (Hung, 2015; Mason, Shuman, & Cook, 2013; Wilson, 2014).

Flipped learning has similarity with other well accepted forms of active learning such as problem-based learning and team-based learning (Baepler, et al., 2014; Schultz, Duffield, Rasmussen, & Wageman, 2014). Engaging students in active learning tasks and activities in place of passive listening is understood to lead to learning and has long been known to work (Herreid & Schiller, 2013). Active learning rather than passive learning has also been linked to feelings of increased competence in students (Gauci, Dantas, Williams, & Kemm, 2009; Lord, Prince, Stefanou, Stolk, & Chen, 2012; Pierce & Fox, 2012; Thaman, Dhillon, Saggar, Gupta, & Kaur, 2013).

Yet there is also evidence that these innovative pedagogical tools and techniques may not contribute to student satisfaction (Missildine, et al., 2013; O'Flaherty & Phillips, 2015) and learning (Brooks, 2014), that students may be uncomfortable or 'feel lost' in a flipped learning setting (Strayer, 2012), and that students may even prefer the traditional classroom (Arnold-Garza, 2014; Findlay-Thompson & Mombourquette, 2014). Perhaps more telling, preparation for the active flipped learning environment represents an increase in student workload for those students whose usual modus operandi is to attend a class in an unprepared manner, and to read materials and construct knowledge on a just-in-time for the exam/assignment basis (Michaelson, 2008). Furthermore, low achieving students may have more difficulty coping in a blended treatment (Owston, York, & Murtha, 2013) because of the implicit emphasis on good self-management and academic skills.

Student engagement, satisfaction, and learning outcomes are related yet distinct phenomena that contribute towards desirable results for students, universities, employers, and society in generally. Just what it is that construes student academic engagement is a matter for discussion, but one that is increasingly on the radar of universities and policy makers (see Baron & Corbin, 2012 for a review; Kahu, 2013). Nonetheless, student engagement is accepted to be correlated with academic success (Salamonson, Andrew, & Everett, 2009) and satisfaction (Bolliger & Martindale, 2004), and leads to favourable educational outcomes (Trowler & Trowler, 2010). Important components of engagement include time spent in learning-related activities (both in and out of the classroom) and attending on-campus learning activities such as attending lectures and tutorials (Salamonson, et al., 2009). Student engagement implies students are intrinsically motivated and want to exercise agency in their studies (Zepke & Leach, 2010). We suggest that students' perceptions of their engagement with learning-related activities can be used to infer the level of their engagement.

Student satisfaction is another construct generating considerable discussion, particularly in the area of blended learning (Owston, et al., 2013). Student satisfaction is generally agreed to be the extent to which students are enjoying their studies (Bedgood & Donovan, 2012). Student satisfaction is used

as a proxy for good teaching (Bedggood & Donovan, 2012), to rank universities on league tables, and by prospective students in their decision making (Douglas, Douglas, McClelland, & Davies, 2014). Satisfaction is not necessarily related to learning outcomes (Carbone, et al., 2014) but may correlate with engagement (Bolliger & Martindale, 2004). Consistent with usual practice, we suggest that asking students to indicate their perceived level of enjoyment for a subject will shed light on their satisfaction.

Learning outcomes are multidimensional, and learning is evident from changes in cognitive, affective, or skills capacities (Kraiger, Ford, & Salas, 1993). Measuring learning outcomes is one method to judge the value-add of education institutions (Douglass, Thomson, & Zhao, 2012), or when extrapolated to the individual class level, the value-add of the course material and pedagogy employed. Although there is evidence that people with less skill in a domain can over-assess their own competence (Kruger & Dunning, 1999), students can develop the capacity to make good judgements about their own performance (Boud, Lawson, & Thompson, 2014), and learning outcomes can be measured objectively and perceived by self-report (Praslova, 2010). Accordingly, asking final year students to indicate the extent to which they believe they meet the learning outcomes of a subject will give an indication of the perceived value-add of the course material and pedagogy employed from the perspective of the student.

MATERIAL AND METHODS

Research context

A third-year undergraduate core subject was flipped using online tutorial modules delivered via a Learning Management System (LMS) and face-to-face workshops. Tutorial modules were to be completed before the workshop and contributed 35% to the overall grade. Each module comprised four optional tasks: the more tasks a student completed, the greater their chance of a high mark. There were seven tutorial modules and seven corresponding face-to-face workshops across the semester. The deadline for each tutorial module submission was the commencement time of its subsequent workshop. Each workshop was of three hours duration and comprised active individual and team based learning tasks submitted via digital devices to the LMS that further explored the material of the tutorial modules. These in-workshop tasks contributed 25% to the overall grade. Students monitored their progressive performance in the tutorial modules and the workshops via the LMS grade centre.

This research uses mixed methods (Bazeley, 2012) and case study methodology (Yin, 2014). The analysis is based on the integration of two data sources (Bazeley, 2012): case study interviews and student surveys. The quantitative survey items and semi-structured interview questions were developed after discussion amongst the unit teaching team.

The sample comprised 53 students, of whom 80% were males, enrolled in a third-year undergraduate subject exploring contemporary issues in entrepreneurship and innovation taught in an Australian university. Participation in the research was voluntary. The survey was opened from the last workshop for a period of five weeks; interviews took place after grades had been finalised and released. The invitation to participate in the survey and telephone interview was distributed via a public appeal during the last workshop and in an email to each student.

The online survey

The survey consisted of 44 questions and took approximately 10 to 15 minutes to complete (n=14). The survey questions were divided into categories, the first of which asked demographic and personal experience questions. The remaining questions captured students' experiences of the unit. Of

the survey respondents, five (36%) were women and half of the respondents were aged between 21 and 23 years of age.

In this paper, we are interested in only those questions that probe engagement, learning outcomes, and satisfaction and do not report on the remaining questions. Question 6 (probing the amount of time students spent working on the subject) was a three-category item and was converted to a scale score (1= less, 2= about the same, 3 = more) for analysis. Responses to Question 12 revealed that no participants had previous experience of flipped classrooms. Questions 13 to 44 required answers on a five-point Likert scale with strongly disagree at 1 to strongly agree at 5. Survey questions are provided at Appendix A.

The topic of *student engagement* was explored by examining the questions that probed student time on task and perceptions of engagement in and with learning activities both in and outside class. Additionally, students were asked to indicate the extent to which they spent working on this subject compared to other subjects (ranked as 1 = less, 2= about the same, 3 = more). *Student satisfaction* was captured by questions probing perceptions of enjoyment and satisfaction. Achieving a good understanding of course materials is included as part of satisfaction because it infers perceptions of mastery which in turn are likely to induce feelings of enjoyment and/or satisfaction. *Learning outcomes* were derived from questions developed to address the students' perceptions of the subject learning outcomes.

The case studies

A 30-minute telephone interview was conducted with four students after completion of semester. These students are a subset of the 14 who completed the survey. Of the case study respondents, all were final year students, with three male and one female. The interviewees were between 20 and 26 years of age except for one male who was between 41 to 50 years of age.

The purpose was to explore the experiences of students participating in this model of teaching and learning. Interviews were anonymised and allocated a code, transcribed, and thematically analysed by two of the authors. High levels of inter-rater agreement were achieved through the process of coding and analysis. Interview questions are provided at Appendix B.

RESULTS

The results presented here are divided into four sections, each of which explores one of the variables investigated: student engagement, student satisfaction, student learning outcomes, and the challenges with the flipped classroom. We report on both survey and interview findings. Variables, their component questions, and mean scores are reported in Table 1.

Table 1. Engagement, satisfaction, and learning outcomes questions and means

Category	Question	Means <i>n=14, except Q 6)</i>
Student Engagement (M=4.1)	Q6 Compared to my other subject, the amount of time I spend working on this subject was: (less, about the same, more)	2.89, n=9
	Looking back over this semester the structure of ENT30010 (online tutorial modules followed by a workshop) enabled me to:	
	Q14 Be motivated to do the work of the unit	3.6
	Q15 Be engaged with the subject	3.9

	Q19 Make better use of my student/learning time	4.1
	Q20 Put me in control of my learning	4.1
	The self-paced, online tutorial modules:	
	Q22 Enabled me to make better use of my study/learning time	4.1
	Q23 Put me in control of my learning	4.2
	Q24 Enabled me to work at times that I found convenient	4.4
	In general:	
	Q38 I regularly monitored the marks I received for Tutorial Modules to see how I was going with this assessment item	4.5
	Q39 I regularly monitored the Participation Points I received to see how I was going with this assessment item	4.3
Student Satisfaction (M=4.1)	Looking back over this semester the structure of ENT30010 (online tutorial modules followed by a workshop) enabled me to:	
	Q13 Achieve a good understanding of course materials	4.1
	Q17 Have an enjoyable learning experience	4.1
	Q44 Overall, ENT30010 was a satisfying learning experience for me	4.2
Learning Outcomes (M=4)	Having completed ENT30010 I believe:	
	Q32 I understand how entrepreneurship and innovation could be used to solve a range of problems that might arise in the business context	4.3
	Q33 I could use entrepreneurship and innovation tools to generate commercialisation opportunities	3.7
	Q34 I can see the relevance of entrepreneurship and innovation to my business discipline	4

Student engagement

Survey participants strongly agreed that the structure of the unit had put them in control of their learning (Q20 M=4.1 and Q22 M=4.2). The interview participants all identified that the flipped and/or online approach pushed self-directed learning. All were in support of this practice as it would lead to greater understanding of the material and connection to it: “Students become more independent.” Participants did identify, however, that the self-directed approach required students to do the work or else they would fall behind: “If you had not done the work, you were very behind and you could not understand what everyone else was talking about, [you were] in a lot of trouble.”

In the survey, participants generally agreed the structure of the unit had motivated them to do the work (Q14, M=3.6), be engaged with the subject (Q15, M=3.9), and regularly monitor their assessment progress via the learning management system (Q38 M=4.5, Q39 M=4.3). This was supported by interviewees who reported that both the approach had increased their personal motivation (“I liked getting the results as soon as the work was uploaded, this motivated me and encouraged me to work hard”) and self-confidence increased as a result of the flipped unit (“There was a sense of accomplishment throughout the unit, you can really tick the boxes off as you go along as the instructor marks them”).

The students who participated in the interviews indicated they found that the self-directed learning, coupled with the ability to directly manage their own time, led to a positive experience and strong outcomes: “You have 100% control over your study, it does come down to the student, and if they are not motivated the learning will be poorer than traditional learning.”

There was also the recognition on the part of all interview participants that individual motivation plays a significant role under the flipped approach. The suggestion emerging is that those who were engaged might experience an increase in motivation, but those that did not connect with the approach or brought poor study habits and were not willing to engage would suffer poor results: “With no one constantly telling you what to do those that are not self-motivated may be challenged.” One participant explained this through his personal experience in the class, where his group was not motivated which led to him having less opportunity to dig deeper into the material though the individual wanted to. The students identified that their own study habits were important, with two acknowledging that they were generally unmotivated, but that their level of engagement and enjoyment increased under this approach.

Research participants strongly agreed that the unit had enabled them to work at times that they found convenient (Q21 M=4.4). The interviewees indicated that by utilising the various technologies (twitter, blogging, online quizzes, online readings, and videos) and utilising the electronic devices to submit responses, they received significant benefits from the experience. One significant benefit related to their ability to have greater control over their study in their lives: “The positives are that you can work in your own time and juggle and shuffle your part time job and other commitments with your university, greater flexibility for sure.” These students were able to do their work at various times and at various locations that were conducive to their schedules: “Students need to make a living and finish a degree, both domestic and international, the minimum contact hours and the flexibility of when to do the work helps make this possible.” It was noted that the flipped class approach also allowed them to capitalize on employment opportunities.

The use of electronic devices in workshops also created some benefits, relating to how students may prefer to engage with learning materials: “The new generation is always on their phone and you need to connect to that with learning to engage students, I do not think handing out a piece of paper is really going to work, if you can put it on something they are going to use. It is more engaging to use technologies to engage and participate in the activities going on.”

The use of electronic devices was also noted as part of their everyday life and the use of them in studying was viewed as a natural and positive extension: “Quite up to date with nowadays generation—nothing new to get used to, but getting used to incorporate uni work with the social media we already were using [was] not a problem.”

Additionally, students may take advantage of the technologies in use in order to accommodate their lack of time: “I tend to do everything very last minute, but it always happens to be a last minute thing, but since this class was set differently and had technology, it made it easier to get motivated to get to work.” A key benefit that was noted from the flipped approach was that it can increase time management skills: “I improved my study habits as the unit progressed - handing in late work or just on time, and the unit forced me to be more organised.”

One participant noted that the ability to scan documents for key words allowed him to complete tasks in less time. The overall feeling on the part of the student was that under a flipped approach both motivation and engagement would increase: “I am an average student—I do not always do all the readings. Motivation can be patchy. I found the unit did really help me—having something to do every week really kept me motivated.”

Student satisfaction

Research participants were generally very satisfied with the learning experience in the unit (Q44 M=4.2), and they agreed that completing online self-paced tutorials was preferable to attending weekly

face-to-face tutorials (Q37 M=4.1). These students found the structure of the subject helped them achieve a good understanding of the course (Q13 M=4.1) and have an enjoyable learning experience (Q17 M=4.1).

All four interview participants indicated a preference towards the flipped classroom approach and the use of online modules as opposed to the traditional face-to-face approach for tutorials. The flipped class approach was preferred for two main reasons. Firstly, there was a belief that the online approach is more in line with how students learn today: “To be honest, it is my way of learning stuff, by watching videos and reading stuff and answering questions. It was a great way to learn.” Secondly, some students felt that it was more practical for them to have unit content presented online: “It required students to work on their own, by watching videos and reading articles and applying the ideas learned to entrepreneurship, I found this pushed me a bit to get engaged.”

Learning outcomes

Although research participants agreed they could see the relevance of the subject to their own discipline (Q34 M=4), they did not as strongly agree that they could use the entrepreneurship and innovation tools to generate commercialisation opportunities (Q33 M=3.7). There was stronger agreement, however, that having completed the unit, participants felt they understood how entrepreneurship and innovation could be used to solve a range of problems that might arise in the business context (Q32 M=4.3).

The self-paced online component created an increased connection with the material, which in turn led to increased personal reflection on the material: “The module content gave me insight in to what is happening and dealing with problems like the environment, it led to some self-reflection.” Retention of information was furthermore strengthened: “Improved memory recall and helped me understand the work better.”

The self-directed online components also enhanced participating students’ perceptions of their ability to link the material from the modules to the workshops, allowing a deeper understanding of concepts and theories to emerge during workshop discussions: “It was up to you to interpret the content during the week, but going to the lecture clarified the purpose behind what we were reading and watching and learning.” One participant noted that while the learning was self-directed, the shared knowledge and individual interpretation that resulted induced a stronger connection between group members and the class as a whole through the dialogue that occurred in the workshops: “We engaged more with the students in our class, the work led to more experience and more understanding and more intellectual conversations in class, got to hear more opinions with this sort of class.”

Challenges of the flipped approach

A common finding was that adjusting to the flipped classroom and its expectations created a significant learning curve at the start of the semester. The challenges identified related to understanding: the processes involved, the expectations of the instructors, the format of the modules and workshops, and how the work of the modules would come together in the workshops. This was a short term problem with interviewees identifying that it was resolved after the first cycle of activities: “At first, the flipped caused problems, not knowing what to expect, there was a learning curve.” Once having completed a cycle of modules and having the content brought into the workshop, students had better clarity around expectations and requirements, and the learning curve challenges were resolved: “It took the first week to understand the process [flipped class], but once I saw the modules and requirements it flowed very well for me.”

Interviewees made several suggestions of how this could have been resolved in advance, through an in-class information session to start the course or the development of online content (such as videos, podcasts or Q & A): “An overview [of flipped classroom process] before the class started. I would be ok with a podcast or someone speaking it, to explain the process.”

Another challenge reported by students concerned the time required by the unit. Students responded that the amount of time they spent working on this subject compared to other subjects was more (Q6 M=2.9, N=9; this is the only question using a 3-point Likert scale). Multiple interviewees noted that some content was too arduous to be completed online: “Some videos and some readings were too long, so reckon having classes or workshops every week it would have broken down what had to do each week—a little too intensive.”

Another negative identified was that the use of devices and technologies facilitated the presence of distracting social media platforms during study time: “Facebook is a distraction, as if you are logged on to your computer you spend time on it, similarly with YouTube, stopping the main video and watching other items.”

DISCUSSION AND CONCLUSION

We base our discussion and findings on the results and responses provided by those students who participated in this research. We find these students did perceive they experienced high levels of engagement, satisfaction, and learning outcomes in this flipped classroom; however, they also experienced confusion in the early part of the course.

Our observation of the class, coupled with the results emerging from this data, is that students who do not have good study or class preparation habits are exposed by the demands of the flipped classroom. These unhelpful study behaviours, when coupled with the feelings of confusion the format and expectations of the flipped class engender, may contribute to undermining such a student’s willingness to adapt and engage with the class. Although our results are based on a small sample drawn from a pilot study, our observation is that flipped classrooms, like more traditional models of teaching and learning, better suit some students than others. Furthermore, implementing flipped classrooms involves up-skilling students in good digital learning behaviours to assist them to more readily adapt to and take advantage of the benefits of the flipped classroom.

None of the students in this class reported prior experience with flipped classrooms, either informally when questioned in class or through this research process. Thus, this pedagogy was an entirely new experience to this cohort. Nonetheless, our results suggest that students might appreciate a flipped classroom approach, and those interviewed cited many benefits including increased ownership, flexibility, engagement, and satisfaction with the unit. Consistent with other research, these results suggest students may favour the flipped classroom more than the traditional lecture format (Prober & Khan, 2013). However, we find that adapting to the flipped environment presents challenges which we suggest include the foreign nature of the requirements and expectations of the flipped class, student perceptions of increased workloads, and inadequate academic/personal skills for remaining focused and disciplined in a learning environment in which all platforms (including social media) are readily available.

Initial student frustration has been found in other studies of flipped approaches due to unclear student expectations of the format (Mason, et al., 2013). Other studies of flipped classrooms have found that students do not like the expectation they are responsible for their own learning (Wilson, 2014) and some can ‘feel lost’ (Strayer, 2012). Understanding the requirements and expectations of a flipped class presents a real challenge to students—an important result emerging from this research. As flipped

classrooms or flipped learning are relatively new pedagogies within higher education, they are being delivered to cohorts of students schooled in, and knowledgeable about, the expectations and requirements of traditional delivery methods. In this flipped classroom, these new and different expectations and requirements were comprehensively integrated with digital technologies—particularly with the use of the LMS for completion of both flipped and in-class tasks. Adapting to the expectations and requirements of any flipped classroom may present a cognitive burden that is additional to developing a critical understanding of the subject’s content where students are unfamiliar with this pedagogy.

Thus, we suggest the flipped classroom’s requirements coupled with the use of digital technologies can stimulate feelings of uncertainty and less confidence in some students. That is, their knowledge and practice of the process required to achieve assessment outcomes may not be suited to the task. This change may be a challenge, if not a form of threat, to such students. If the student is not able to replace such feelings with positive feelings as the semester progresses, it is likely to set up the student for perceptions or experiences of less engagement, less satisfaction, and poor learning outcomes as they struggle or fail to come to terms with a foreign way of studying. This may provide some explanation for the conflicting results in the literature about levels of perceived student satisfaction in flipped classrooms (Davies, et al., 2013; Missildine, et al., 2013).

The results indicating that more time was spent on this subject than their other subjects may highlight an interesting but possibly silent trend. That is, over time there has been perceptible erosion in the understanding by students of time study requirements for a subject. Michaelson (2008) voices the observation that students do only enough study and preparation for assessment items, often overlooking or ignoring the preparatory or private study recommended that builds their knowledge base in a subject. In flipped learning, preparatory work is made explicit and becomes necessary. Thus, students habituated to allocating minimal hours in private study time may have filled their university non-contact hours with other commitments, thereby perceiving the flipped class to be “more work” than the traditional format.

As established in this and other research (see for example Zhu, Kaplan, Dershimer, & Bergom, 2011), students acknowledge an issue with the depth of content available and the use of online tools that distractingly bring together their personal, professional, and educational lives. There are different implications for the distraction provided by digital tools. The positive occurs when students are distracted by content or other platforms that allow going ‘further down the rabbit hole’ with exploring and content sharing that extends or moves past course expectations and objectives. The negative perspective is at least twofold. Students distracted by exploration that takes them further from assigned tasks and requirements may struggle to balance the need to complete assigned activities with their exploratory and sharing activities. Secondly, with the increasing use of digital devices to both deliver tasks and capture responses, these online platforms are seamlessly accessible within the classroom environment. Consequently, “hidden in plain sight” are students who are actively disengaged from the class and actively engaged with their social media platforms.

The distracting nature and contribution to degraded performance of both social media platforms and multitasking is recognised (Sana, Weston, & Cepeda, 2013; Zhu et al., 2011). With students increasingly required to utilise forms of online learning in class and at home, a subtle shift is taking place in the time management tools and strategies needed to ensure students are maximizing their productive time, minimising distractions, and working towards good learning outcomes. We suggest that student learning and academic skills development for digital and blended learning may be subtly different from those we typically use to prepare students to make the most effective and productive use of their learning time. Our data does not provide enough evidence to confidently comment on the

prevalence of each perspective in our sample, but the impact on teaching and learning of these potential distractions is an important topic worthy of further research.

Although this flipped learning class achieved perceived good learning outcomes for the students who participated in our research—with 71% gaining a credit or higher and there being no fails—there is room for improvement in the design and delivery of pedagogies employed and in the evaluation of learning outcomes. This pilot suggests the students participating in the research found the flipped classrooms using blended and digital technologies to be engaging, led to satisfaction, and helped them achieve learning outcomes. However, the findings coupled with in-class observations also suggest the strategy of flipped learning integrated with digital technologies such as the LMS can present a substantial learning curve. Wiesenber (2013) observes the need for educators to be aware of, and provide resources for, addressing the challenges and stresses of online education. Similarly, in flipped classrooms utilising digital technology, attention needs to be given to strategies for shepherding students through the initial learning curve to help them adapt rapidly until these emergent forms of teaching and learning have become more prevalent in higher education.

Praslova (2010) suggests a modification of Kirkpatrick's four-level model of training criteria for us in the assessment of learning outcomes. Our research limits itself to reporting the reaction criteria (student perception), and additionally the teaching team used learning criteria (class-appropriate assessments) in the iterative evaluation of the pedagogies employed in this and subsequent semesters (not reported in this paper). Praslova (2010) suggests the additional inclusion of transfer criteria (such as evidence of student knowledge employed in contexts outside the classroom) and results criteria (such as evidence of character development and ethical readiness for leadership and civic roles). Using such an expanded model of evidence for the achievement of learning outcomes would provide further insights into the certainty of benefits identified in the use of flipped and blended pedagogies.

The results of this pilot need to be viewed with caution. The small sample size raises the prospect of selection bias in our results. Missing from the data are the voices of students who were not satisfied with the class. The university's feedback survey for this class revealed a higher median than mean score for the overall satisfaction question, suggesting very dissatisfied outliers in the data. The university survey was completed by 18 students compared with 14 for this research, and these results may present one end of a spectrum of responses to the flipped classroom. Nonetheless, the data we collected from the interviewees contains problems and shortcomings with the method and model, giving us some confidence that our quantitative results are not biased to the extent that we should ignore them, but they may not be generalizable. Subsequent research, conducted on larger numbers of students, will reduce the possibility of selection bias and give more confidence with forming conclusions. Finally, as a pilot study, these are not longitudinal results, and further studies are planned to monitor the engagement, satisfaction, and learning outcomes of students as the subject evolves over a series of semesters.

Rosemary Fisher is a researcher and Director of the Masters of Entrepreneurship & Innovation Program at Swinburne University, Australia.

Bella Ross is a researcher and lecturer with the Student Academic Support Unit at Monash University, Australia.

Rick LaFerriere is an Early Career Researcher and lecturer in entrepreneurship at Swinburne University, Australia.

Alex Maritz is a Professor of Entrepreneurship at LaTrobe University and Education Director of the ARC Biodevices Unit at Swinburne University, Australia.

REFERENCES

- Abeysekera, L., & Dawson, P. (2015). Motivation and cognitive load in the flipped classroom: definition, rationale and a call for research. *Higher Education Research & Development, 34*, 1-14.
- Arnold-Garza, S. (2014). The Flipped Classroom. *College & Research Libraries News, 75*, 10-13.
- Australian Bureau of Statistics. (2013). Hitting the books: Characteristics of higher education students. In *Australian Social Trends, July 2014* (Vol. 2015). Canberra, AU: Australian Bureau of Statistics.
- Baepler, P., Walker, J. D., & Driessen, M. (2014). It's not about seat time: Blending, flipping, and efficiency in active learning classrooms. *Computers & Education, 78*, 227-236.
- Baron, P., & Corbin, L. (2012). Student engagement: Rhetoric and reality. *Higher Education Research & Development, 31*, 759-772.
- Bazeley, P. (2012). Integrative analysis strategies for mixed data sources. *American Behavioral Scientist, 56*, 814-828.
- Bedgood, R., & Donovan, J. (2012). University performance evaluations: What are we really measuring? *Studies in Higher Education, 37*, 825-842.
- Bolliger, D. U., & Martindale, T. (2004). Key factors for determining student satisfaction in online courses. *International Journal on E-Learning, January-March*, 61-67.
- Boud, D., Lawson, R., & Thompson, D. G. (2014). The calibration of student judgement through self-assessment: Disruptive effects of assessment patterns. *Higher Education Research & Development, 34*, 45-59.
- Brooks, A. W. (2014). Information literacy and the flipped classroom: Examining the impact of a one-shot flipped class on student learning and perceptions. *Communications in Information Literacy, 8*, 225-235.
- Canadian Federation of Students. (2013). Student employment: Eroding academic success. In *Fact Sheets and Advisories* (Fall 2013 ed., Vol. 2015). Ottawa, ON: Canadian Federation of Students.
- Carbone, A., Ross, B., Phelan, L., Lindsay, K., Drew, S., Stoney, S., & Cottman, C. (2014). Course evaluation matters: Improving students' learning experiences with a peer-assisted teaching programme. *Assessment & Evaluation in Higher Education, 40*, 165-180.
- Chen, Y., Wang, Y., Kinshuk, & Chen, N. S. (2014). Is FLIP enough? Or should we use the FLIPPED model instead? *Computers & Education, 79*, 16-27.
- Christensen, C. M. (2002). The opportunity & threat of disruptive technologies. In *Faculty Seminar Series* (Version 2.1 ed., Vol. Product Number 1482C). Boston, MA: Harvard Business Publishing.
- Citi, & Seventeen. (2013). New Citi/Seventeen survey: College students take control of their financial futures. Retrieved from <http://www.citigroup.com/citi/news/2013/130807a.htm>.
- Colvin Clark, R. (2015). Evidence-based training methods: A guide for training professionals. In: Books24x7.
- Davies, R., Dean, D., & Ball, N. (2013). Flipping the classroom and instructional technology integration in a college-level information systems spreadsheet course. *Educational Technology Research and Development, 61*, 563-580.
- Douglas, J. A., Douglas, A., McClelland, R. J., & Davies, J. (2014). Understanding student satisfaction and dissatisfaction: An interpretive study in the UK higher education context. *Studies in Higher Education, 40*, 329-349.
- Douglass, J. A., Thomson, G., & Zhao, C. M. (2012). The learning outcomes race: The value of self-reported gains in large research universities. *Higher Education, 64*, 317-335.
- Endsleigh Insurance Services Limited. (2015). 77% of students now work to fund studies. Retrieved from <https://www.endsleigh.co.uk/>.
- Enfield, J. (2013). Looking at the impact of the flipped classroom model of instruction on undergraduate multimedia students at CSUN. *TechTrends, 57*, 14-27.
- Findlay-Thompson, S., & Mombourquette, P. (2014). Evaluation of a flipped classroom in an undergraduate business course. *Business Education & Accreditation, 6*, 63-71.
- Garrison, D. R., & Kanuka, H. (2004). Blended learning: Uncovering its transformative potential in higher education. *Internet and Higher Education, 7*, 95-105.
- Gauci, S. A., Dantas, A. M., Williams, D. A., & Kemm, R. E. (2009). Promoting student-centered active learning in lectures with a personal response system. *Advances in Physiology Education, 33*, 60-71.
- Henderson, M., Selwyn, N., & Aston, R. (2015). What works and why? Student perceptions of 'useful' digital technology in university teaching and learning. *Studies in Higher Education, 42*(8), 1567-1569

- Herreid, C. F., & Schiller, N. A. (2013). Case studies and the flipped classroom. *Journal of College Science Teaching, 42*, 62.
- Higgitt, D. (2014). Disruptive moments. *Journal of Geography in Higher Education, 38*, 1-6.
- Hung, H. T. (2015). Flipping the classroom for English language learners to foster active learning. *Computer Assisted Language Learning, 28*, pp 81-96.
- Johnson, G. B. (2007). *Student perceptions of the flipped classroom*. (Unpublished Masters Thesis). The University of British Columbia, Vancouver, BC.
- Kahu, E. (2013). Framing student engagement in higher education. *Studies in Higher Education, 38*, 758-773.
- Kraiger, K., Ford, J. K., & Salas, E. (1993). Application of cognitive, skill-based, and affective theories of learning outcomes to new methods of training evaluation. *Journal of Applied Psychology, 78*, 311-328.
- Kristjanson, L. (2013). Leading change: How Swinburne is creating its own future. In *Tertiary Education Management Conference 2013*. Melbourne, Australia: Swinburne University of Technology.
- Kruger, J., & Dunning, D. (1999). Unskilled and unaware of it: How difficulties in recognizing one's own incompetence lead to inflated self-assessments. *Journal of Personality and Social Psychology, 77*, 1121-1134.
- Lord, S. M., Prince, M. J., Stefanou, C. R., Stolk, J. D., & Chen, J. C. (2012). The effect of different active learning environments on student outcomes related to lifelong learning. *International Journal of Engineering Education, 28*, 606.
- Mason, G., Shuman, T., & Cook, K. (2013). Comparing the effectiveness of an inverted classroom to a traditional classroom in an upper-division engineering course. *IEEE Transactions on Education, 56*, 430-435.
- Michaelson, L. (2008). First-day questions for the learner-centered classroom. *The National Teaching & Learning Forum, 17*, 1-2.
- Missildine, K., Fountain, R., Summers, L., & Gosselin, K. (2013). Flipping the classroom to improve student performance and satisfaction. *Journal of Nursing Education, 52*, 597-599.
- O'Flaherty, J., & Phillips, C. (2015). The use of flipped classrooms in higher education: A scoping review. *The Internet and Higher Education, 25*, 85-95.
- Owston, R., York, D., & Murtha, S. (2013). Student perceptions and achievement in a university blended learning strategic initiative. *Internet and Higher Education*. pp 38-46.
- Pierce, R., & Fox, J. (2012). Vodcasts and active-learning exercises in a "flipped classroom" model of a renal pharmacotherapy module. *American Journal of Pharmaceutical Education, 76*.
- Praslova, L. (2010). Adaptation of Kirkpatrick's four level model of training criteria to assessment of learning outcomes and program evaluation in higher education. *Education Assessment Evaluation and Accountability, 22*, 215-225.
- Prober, C., & Khan, S. (2013). Medical education reimaged: A call to action. *Academic Medicine, 88*, 1407-1410.
- Ruddick, K. W. (2012). *Improving chemical education from high school to college using a more hands-on approach*. (Unpublished Ph.D Dissertation). University of Memphis, Ann Arbor, MI.
- Salamonson, Y., Andrew, S., & Everett, B. (2009). Academic engagement and disengagement as predictors of performance in pathophysiology among nursing students. *Contemporary Nurse, 32*, 123-132.
- Salmon, G., & Angood, R. (2013). Sleeping with the enemy. *British Journal of Educational Technology, 44*, 916-925.
- Sana, F., Weston, T., & Cepeda, N. J. (2013). Laptop multitasking hinders classroom learning for both users and nearby peers. *Computers & Education, 62*, 24-31.
- Schultz, D., Duffield, S., Rasmussen, S. C., & Wageman, J. (2014). Effects of the flipped classroom model on student performance for advanced placement high school chemistry students. *Journal of Chemical Education, 91*, 1334-1339.
- Strayer, J. F. (2012). How learning in an inverted classroom influences cooperation, innovation and task orientation. *Learning Environments Research, 15*, 171-193.
- Te Riele, K. (2014). *Putting the jigsaw together: Flexible learning programs in Australia*. Final report. Melbourne, AU: The Victoria Institute for Education, Diversity and Lifelong Learning
- Tham, C. M., & Werner, J. M. (2005). Designing and evaluation e-learning in higher education: A review and recommendations. *Journal of Leadership and Organizational Studies, 11*, 15-25.
- Thaman, R. G., Dhillon, S. K., Saggar, S., Gupta, M. P., & Kaur, H. (2013). Promoting active learning in respiratory physiology-positive student perception and improved outcomes. *National Journal of Physiology, Pharmacy and Pharmacology, 3*, 27-34.

- Trowler, V., & Trowler, P. (2010). Student engagement evidence summary. In *The Higher Education Academy Student Engagement Project*: University of Lancaster.
- Wiesenberg, F. (2013). The roller coaster life of the online learner: How distance educators can help students cope. *Canadian Journal of University Continuing Education*, 27, pp 33-59.
- Wilson, S. (2014). The flipped class: A method to address the challenges of an undergraduate statistics course. *Teaching of Psychology*, 40, 193-199.
- Yin, R. K. (2014). *Case study research: Design and methods*. Thousand Oaks, CA: Sage.
- Zepke, N., & Leach, L. (2010). Improving student engagement: Ten proposals for action. *Active Learning in Higher Education*, 11, 167-177.
- Zhu, E., Kaplan, M., Dershimer, R. C., & Bergom, I. (2011). Use of laptops in the classroom: Research and best practice. *CRLT Occasional Papers Vol 30*. Ann Arbor, MI: The University of Michigan. pp 1-6.



Copyright for the content of articles published in *Teaching & Learning Inquiry* resides with the authors, and copyright for the publication layout resides with the journal. These copyright holders have agreed that this article should be available on open access under a Creative Commons Attribution License 4.0 International (<https://creativecommons.org/licenses/by/4.0>). The only constraint on reproduction and distribution, and the only role for copyright in this domain, should be to give authors control over the integrity of their work and the right to be properly acknowledged and cited, and to cite *Teaching & Learning Inquiry* as the original place of publication. Readers are free to share these materials—as long as appropriate credit is given, a link to the license is provided, and any changes are indicated.