

## **Course redesign to incorporate flipped delivery: A business degree case in Vietnam**

**Ashish K. Das, Quynh T. Nguyen**

*RMIT University, Vietnam*

**An T. Nguyen**

*University of Otago, New Zealand*

**Milton Nomikoudis**

*RMIT University, Vietnam*

**Dung Ha Van**

*Banking University of Ho Chi Minh City, Vietnam*

Conventional, teacher-centred classroom activities are prominent in Vietnam where educators are familiar with a one-way flow of information and using limited resources for their practice, whilst a culture of creativity in the classroom is often ignored. Vietnamese educators face a huge challenge, motivating passive learners to be more creative and active learners as society responds to rapid changes in technologies. This article suggests that a flipping structure that incorporates a design thinking approach paves the way for course designers to assist passive learners to become more active in their learning processes. An undergraduate course was redesigned and delivered in a flipped classroom design, aiming at nurturing active learning among students. Quantitative findings highlighted that there was an improvement in student's engagement, including intellectual engagement and attendance, and that overall student satisfaction improved.

### **Introduction**

#### **Teaching and learning environment in Vietnam**

In Vietnam, the traditional classroom environment of a didactic pedagogy has been dominant from primary right through to university education (Huong & Fry, 2002). This learning journey of Vietnamese students has featured a passive and dependent learning style, which accentuates the role of teachers and lecturers in the classroom as experts and transferrers of knowledge (Tran, 2013; Thao-Do, Bac-Ly & Yuenyong, 2016). Moreover, the traditional norm that regards teachers as the central source of knowledge influences students' preference for the lecture-centred teaching mode (Luong, 2016). Digital learning materials from various sources, as well as peer discussions, are not utilised prominently in Vietnamese educational environments. Instead, both students and lecturers mainly rely on prescribed textbooks, which often are not recent publications and include outdated business and technology information, especially about Vietnam (Berardo, 2006; Nguyen, 2011). In the classroom, students are expected to watch and listen whilst lecturers deliver instruction (Nguyen, 2012). As a result, students become obedient and do not critically question skill-based instructions (Littlewood, 2000). Various studies have examined these consequences in Asian countries where this form of pedagogy is applied. For example, in China, learners have a tendency to memorise teaching materials and may be incapable of adequately synthesising different perspectives (Cheng, Andrade & Yan, 2016). Chinese

students are not encouraged to develop creative abilities even though creative thinking is often a capability required and demanded by industry employers (Finch, Hamilton, Baldwin & Zehner, 2013; Takahashi & Saito, 2013). A consequence of this outdated educational thinking has been the success of international and private education providers, who have introduced Vietnamese students to creative curriculum, teaching materials and learning environments (Lau et al., 2018; Yao & Collins, 2018).

The “flipped classroom” approach has received increasing attention from college educators in recent years as a solution to enhance students’ engagement and improve learning outcomes. Bergmann & Sams (2012) remarked that flipped classroom empowers the learners rather than emphasising the role of the lecturer. Moving the information-transmission activity into students’ self-study time allows students to study at their own pace and better manage their cognitive load (Abeysekera & Dawson, 2015). This allows for a more personalised learning experience and improved engagement in active learning (Gilboy, Heinerichs & Pazzaglia, 2015). Toto & Nguyen (2009) took into consideration the different ‘learning styles’ of students in the design of an industrial engineering course, finding that the flexibility of a flipped structure was potentially suitable for creating learning experiences customised to students’ needs and preferred styles. These findings appear to suggest that the flipped classroom is a potential method to accomplish goals of business education as well as a relevant answer to the issue of passive learning characteristics of Vietnamese students.

Many educators are aware of the fact that design thinking promotes creativity and that its methodology allows individuals to develop insightful solutions (Dorst & Cross, 2001; Dym et al., 2005; Rauth et al., 2010). The notion of design thinking is currently identified as a new paradigm for dealing with the problems in many fields, especially in information technology (Martin 2009; Dorst 2011). Whilst in business contexts and product design industry, experts are cognisant of design thinking and its application, in Vietnam’s education system the design thinking approach, in disciplines as diverse as engineering and nursing education, is a relatively new approach for course development (Dym et al. 2005; Henriksen et al. 2017; Beaird et al. 2018).

The incorporation of the design thinking approach in flipped classroom delivery is relatively new in the Vietnamese context, where passive learning is still dominant. Hence, this study provides insightful findings concerning the application of design thinking to developing teaching materials in a flipped classroom environment, with an emphasis on the importance of promoting creativity and active classroom engagement among Vietnamese students.

### **Creativity and engagement in the classroom learning environment**

Beghetto and Kaufman (2014) stated that the learning environment is considered one of the most important factors in promoting creativity in the classroom. However, educators often do not receive opportunities to take the initiative in creativity in teaching practice (Mann, 2006; Beghetto & Kaufman, 2014). This, in turn, can lead to a situation where lecturers have problems in getting students to engage in their learning. Moreover, Luria et

al. (2017) identified major challenges in the conventional teaching environment, where lecturers guide students based on their well-structured instruction. In other words, cultivating creativity and intellectual engagement in the classroom becomes paramount for educators.

Nurturing creativity is a prolonged process that requires educators and lecturers to have a breadth of understanding about the concept of creativity and its pedagogy (Davies et al., 2013). Understanding how students develop their creativity in particular learning environments is a key factor. In the environment of the classroom where student characteristics and backgrounds are diverse, flexible use of materials can promote their creativity (CAST, 2011; Jindal-Snape et al., 2013; Maley & Kiss, 2018).

A study conducted by Veiga et al. (2014) highlighted that classroom climate and teacher's behaviour have a positive impact on the creativity of students and their engagement in learning. In a similar vein, Brockunier (2016) also emphasised a scenario where incorporating creativity in the classroom leads to an increase in student engagement, including diverse perspectives on intellectual engagement, academic performance, participation in class, learning with peers, and learning environments.

### **Promoting creativity in business education**

Business education in tertiary institutions across many countries emerges as a real challenge for educators due to its diverse and complex nature (Faridi, Arif & Kumar, 2017). Enhancing the quality of teaching, including the promotion of greater creativity in learning, requires a continuous effort in improving curriculum and teaching practices (McIntyre, Hite & Rickard, 2003; Peterson & Pratt, 2004). This increases the need for fostering creative lecturers and instructors, many of whom do not have opportunities to develop their creativity, especially those in emerging economies. Rigid education policies do not ease the burden for those who endeavour to build a creative learning environment and to foster active learning (Henriksen, Richardson & Mehta, 2017).

Passive learning is prominent in some Asian countries, especially in Vietnam, where transmissive teaching, uninteresting course materials and unclear learning objectives often inhibit students' aptitude for solving problems, especially those requiring unconventional solutions (Tune, Sturek & Basile, 2013; Abeysekera & Dawson, 2015; Al-Zahrani, 2015). The digitisation of information and its global reach has changed the learning and social behaviours of all students. Easy access to the Internet has exposed students regularly to an intricate network of online webs for their informal training whilst their traditional learning styles in the classrooms is maintained. Gradually, the influence of digital information sources is disrupting the traditional learning styles of young Vietnamese and producing a demand for new educational perspectives. This change is reflected in a recent study by Supalak (2016), showing a preference for an active learning style among Vietnamese students.

One of the possible solutions is applying a flipped structure that incorporates a design thinking approach to construct innovative learning environments. In essence, the design thinking approach is to solve problems in close working, multi-disciplinary teams that apply an iterative process (Roberts et al., 2016) while designing the materials that are used in the flipped setting. Designers strive to concentrate on users' problems, endeavour to unravel unmet demands, and develop alternative solutions to unsolved issues.

Although many educators are reluctant to use the design thinking process in their teaching practice due to its controversial impacts (Kimbell, 2011), some pioneering academic experts have initiated design thinking to enhance students' learning experiences (Goodyear, 2005; Cahen, 2008). There have been several theoretical frameworks or models of design thinking, such as Roberts et al. (2016), who focused on users' empathy and their needs in the healthcare management sector and in social entrepreneurship projects (Roberts et al., 2016; Chou, 2018). However, the process is generally depicted as a cyclic process with several steps. Stanford University suggests a 5-step design thinking framework to guide designers in their tailoring of courses (Fabri, 2015).

An integration of design thinking in the learning process can empower learners, and subsequently, improve student satisfaction and learning outcomes (Huq & Gilbert 2017). Beckman and Barry (2007) developed a framework for innovation that integrates Kolb's 'experimental learning theory' and Owen's model of design thinking, both models expounding the process of knowledge development. Kolb's theory of experimental learning consists of four iterative elements: experience, reflection, thinking and acting, as a recurring and advancing process to acquire knowledge (Kolb, 1984). Owen (1998) posited design as a form of knowledge generation (similarly to scientific thinking) and the design process is situated in the realms of both theory and practice. In the theoretical realm, participants are involved in the analytic phase to discover and propose solutions, while in the practice realm they invent and put those solutions to work. While design thinking is used by various academic professionals in designing curriculum, the integration of flipped delivery and design thinking has received little attention. Hence, in this study, we explored this option when re-designing a business course.

### **Stanford design thinking approach in business education**

As already mentioned, Stanford offers five steps of design thinking, where problem-solving percolates through a collaborative teamwork in an iterative process (Fabri, 2015). The first stage, *Empathise*, examines the user's behaviour in order to capture problems and their context from the user's perspective. The second stage, *Define*, allows designers to underpin and feature the complexity of the identified problems from different perspectives in a simple description. The third state, *Ideate*, is to explore and develop solutions that are novel and diverse, yet connecting to the problem. Designers apply assorted techniques to achieve solutions covering a breadth and depth of problems. Divergent thinking is utilised to explore problem-solving possibilities and convergent strategies assist designers in refining ideas for solutions while keeping the problems in mind. The outcomes of this stage dictate how a prototype can be designed. The fourth stage, *Prototype*, is when a possible model of a solution is created, aiming to consolidate the

effectiveness of the solution. The last stage is *Test*, where designers observe and collect feedback from users who interact with the prototype. This stage can lead designers to revisit the *Ideate* step to re-examine the initial viewpoint and explore alternatives. The process is iterative and designers can reconsider and revisit the previous stage to clarify problems or model solutions.

### **The Business Computing course description**

Business Computing is one of the eight foundation courses for the Bachelor of Business degree at a campus of an Australian University in South East Asia. It has a high number of enrolments, ranging from 200 to 500 students per semester. Twelve in-class sessions are included in the course, comprising both hands-on laboratory and theoretical modules. The course aims to equip students with the skills and knowledge to propose business solutions that maintain professional and ethical standards (RMIT, 2018).

Prior to 2016, lecturers used conventional teaching methods to prepare the course content and to deliver lectures in the classroom. A typical lecture lasted ninety minutes, during which lecturers continuously explained related concepts and theories, using *PowerPoint* slides. Examples were given to demonstrate how theories are applied. Textbooks were used for in- and out-of-class study. The *Blackboard* learning management system (LMS) was utilised as a focal point for course management. However, students mainly accessed *Blackboard* to obtain *PowerPoint* slides and academic scores. From the instructor's point of view, utilising *Blackboard* as a repository for learning and teaching prevented them from accessing information as to how students made use of course materials outside the classroom. Furthermore, instructors were unable to keep track of students' learning progress since the drop-off rate of class attendance was markedly reduced as weeks went by. Furthermore, instructors were unable to keep track of students' learning progress because the class attendance was markedly reduced as weeks went by and in turn, so was the interaction between lecturers and students. There are three main assessments, taking place in Weeks 6, 11 and 13. There were quizzes at the end of teaching in-class sessions and peer-discussion in the classroom.

The language used within the university campus is English only, covering all aspects of teaching and learning activities and interactions with all stakeholders. Since English as a second language students enrolled in Business Computing must not use Vietnamese language for their learning, they face challenges in contributing their opinions and expressing their ideas to peers and lecturers. This phenomenon of foreign language classroom anxiety inhibits those students from creating dynamic conversations and discussions to retain their engagement in the classroom, which is empirically proven by many studies (Hellsten & Prescott, 2004; Horwitz, Horwitz, & Cope, 1986; Macgregor & Folinazzo, 2018). In return, learners tend to keep silent and instructors struggle to stimulate learners' emotional responsiveness, aiming at reducing boredom and idleness. Perhaps typical in the Asian cultures, Vietnamese university students have been conditioned through their previous schooling to be passive learners, and are not familiar with the concept of co-creation values between learners and lecturers. Hence, enriching the learning experience in classrooms by requiring students to participate actively in

learning activities and become collaborative learners can be problematic. As a result, engagement at the activity level in classroom remains low, if using the characteristics of engagement defined by Philp and Duchesne (2016).

In 2016, the University endeavoured to improve student learning experiences by redeveloping the curriculum of foundation courses. While the curriculum development was based on the Resources-Activities-Support-Evaluation Model, the academic team for Business Computing utilised the steps proposed in the design thinking approach to identify issues in the traditional teaching setting.

## Research design and method

The designers of the course explored design thinking as a framework for revamping teaching materials, focusing on developing creativity instruction, while flipping the class in order to (i) improve student engagement and (ii) transform students from passive to active learners.

In this study, the essence of the “flipped” classroom refers to a setting in which students are assigned more responsibilities to increase active learning. Although there are many theories that underpin flipped learning, including blending learning theory, problem or project-based learning theory, and cognitive taxonomy theory (Hussey, Fleck & Richmond, 2014), following the University dissemination, course coordinators and curriculum designers for Business Computing adopted blended learning theory that enables a well-balanced mixture between online and face to face activities to promote active learning (Graham, 2006).

As the course designers, we aimed to investigate the following questions:

- Whether the new materials used in teaching will improve student engagement the classroom when using the newly designed materials as well as flipping approach?
- Will flipping responsibilities to students increase the overall satisfaction?

## Participants and data collection

The study focused on first year students who were enrolled in Business Computing at the campus of an Australian University in South East Asia. There was a small proportion of students with learning difficulties and disabilities, some overseas students and students on exchange programs. The majority of participants spoke English as a second language and many were still studying an English course while enrolled in Business Computing.

The data was collected from the following sources: (i) lecturers’ logbooks with notes on students’ learning styles and their respective behaviours in class, (ii) attendance sheets for two semesters during the introduction of the new materials in the flipped classroom setting, (iii) various reports extracted from *Blackboard*, and (iv) student experience and overall satisfaction (Table 1).

Table 1: Summary of data collection

	Semester 3, 2015	Semester 2, 2016
Purpose	Understand students' behaviours and learning preferences	Monitor the use of new teaching materials
Qualitative observation and quantitative analysis	Qualitative observation of 151 students	<i>Blackboard</i> reports from a total of 183 students
Participants for in-class attendance	n = 62 (28 males, 34 females) in Semester 3, 2015	n = 63 (32 males, 31 females) in Semester 2, 2016

The qualitative research approach was used to investigate dynamic and complex characteristics of various groups of students. The quantitative approach was used to identify the effectiveness of the newly designed teaching and learning materials. Data were extracted from the LMS, attendance was recorded over two semesters, and the overall scores of academic performance per semester were obtained. Furthermore, quantitative surveys were conducted to measure the overall satisfaction index.

### Proposed steps in the re-design of the course content

While the Stanford design thinking model comprises five steps, our team adopted only three steps to identify issues related to student engagement and in turn, propose activities and materials delivered in flipped classroom. Step 1, *Empathy*, which is to observe and empathise with learner's needs; Step 2, *Define*, which identifies problems in teaching and learning in business education; Step 3, *Ideate*, which defines content and resources along with the process of course delivery.

In steps 1 and 2, the course coordinators attempted to understand how students think about, capture business and technology concepts and theories, and find solutions in business contexts. The eventual outcome of these steps was to uncover insights into what brings values to students when a lecturer discusses a course-related topic. Two groups of students (n = 62) were selected and observed during Semesters 3, 2015. Common patterns emerged from the results of the direct observations, showing that many students brought the recommended textbook to the classrooms as a supporting material. In addition, in discussion with their peers, students spent a significant amount of time reading *PowerPoint* slides as well as the textbook for their comprehension. Hence, active engagement in group discussion became difficult to maintain, and as a result, instructors often interfered in order to boost learners' motivation for opinion contribution. The number of active learners in these two observed groups was in the minority. However, when students were assigned a problem-solving task using a combination of short narratives and caricature formats, peer discussion became more animated and more opinions were offered by the participants. This finding showed that many students preferred rich visual materials that assisted them in capturing a concept or situation. The study revealed that Vietnamese students enrolled in the course exhibited a number of learning style preferences. Many learners engaged with the auditory and kinaesthetic elements of the learning materials. This finding is also in line with the studies by Tuan in 2011 and Hung in 2014 (Tuan 2011; Hung 2014).

Outdated teaching resources, such as older textbooks, do not include up-to-date solutions, especially in the applications of advanced technologies in business. Hence, students have an ambiguous vision of the impact of the old and new technologies in business development. To define the problems faced in class, the designers of this course developed an empathy map, including a set of questions for each learning session that highlighted challenges in students' use of learning materials.

In Step 3, the academic team, comprising designers, lecturers and teaching and learning consultants, offered students various types of learning resources, rather than just the textual content accompanied by a lecturer's voice. This suggestion is in line with findings by Lyons, Reysen & Pierce (2012). The final course design offered a total of 34 videos, one simulated game and 22 images throughout the 12-weeks course. In addition, substitute videos and other text resources corresponding to each lecture were available to the teaching team in order for them to have flexibility in terms of students with a various preferences for their learning. These substitute materials were evaluated based on three main criteria: (i) purpose of each video/text, (ii) appropriate presentation in terms of cultural context, and (iii) the duration or length of a video or text content. In each lecture, a 60-minutes session comprised sub-sections that were constructively aligned with the weekly intended learning outcomes, and each sub-topic carried a different weight which was converted to percentile, and eventually contributed to a total score of 100% upon completion of a lecture (Biggs & Tang, 2007). This intuitive design had a decisive influence on users' decisions about using the course content on the LMS (Al-Samarraie, Selim & Zaqout, 2016).

Between sub-topics, students took turns in small collaborative groups to pose questions about aspects of the topic(s), video(s), or diagram(s) that were presented. This gave an opportunity for participants to raise more critical thinking questions with their peers, and cumulatively improve their cognitive skills and increase the level of in-class engagement (King, 1990). Also, instant feedback, including suggestions and examples, was given to some students to assist them in clarifying and organising complex concepts (Thai et al., 2017). For developing creativity in class, designers applied Socratic questioning methods, along with showcases based on up to date business problems for peer discussion. These were designed to give students opportunities to critically analyse business problems from different perspectives and to develop unusual solutions from angles requiring imagination (Yang, Newby, & Bill, 2005).

In the *Ideate* stage, the academic team spent a period of six months redesigning and revamping the course materials to adapt them to the flipped classroom setting. They reported a major challenge was to constructively align the structure of topics per lecture to the intended learning outcomes. The team allocated half of the design stage to simply transcribing existing *PowerPoint* slides into itemised topics. Recording videos, composing annotations and developing animation clips, were additional challenges the team had to overcome, due to the abundance of material available in relation to the topics of the course, and the need to identify whether Vietnamese students would be engaged.

A weekly lecture consisted of three main parts. In the pre-learning session, students were expected to watch a video and narrative text to quickly capture a simple concept related to business analytics. In the in-class session, students interacted with both lecturers and course content on the LMS for a duration of sixty minutes (instead of the usual ninety minutes in the traditional classroom approach). Once the student completed a face to face lecture, learners were asked to review and answer questions in the post-lecturing section. Preparation of the pre-and post-preparation teaching materials for students was another challenging task. A number of studies have demonstrated a dissatisfaction from learners when a substantial amount of time has to be spent on performing pre-and post-class activities (Missildine et al., 2013; Lo & Hew, 2017). This necessitated consideration of factors including formats for resources, levels of cognitive knowledge, and decisions on the time duration of activities while re-designing the course content.

### **Engagement measures**

Student engagement is defined differently from different viewpoints. Some scholars considered student engagement as a way to manage student behaviour in class and to facilitate learning effectively (Parsons & Taylor, 2011). Others concluded that student engagement is based on how much time, energy and effort students invest in the learning process, and their feelings about learning (Dixson, 2015). Since the student engagement concept is predicated on one's viewpoint and approach to teaching delivery, measuring student engagement also varies based on pedagogical approaches. While this study focuses on flipping delivery aided by technology, the academic team explored ways to measure student engagement through both online interaction and interaction with students in classroom environments.

Regarding face to face delivery, observations from teachers about student engagement, including class participation or attendance have been used to capture information on student learning (Henrie, Halverson & Graham, 2015; McLaughlin et al., 2014); Stewart, Stott & Nuttall, 2011). Intellectual engagement is another indicator to measure the effectiveness of students engaging in activities in class. This indicator has been used in many studies to explore ways to engage with disengaged students (Schussler, 2009), and especially to intellectually gauge student engagement with their learning in the first year of their university study (Krause & Coates, 2008). The academic team's intent is to use intellectual engagement to measure student engagement in peer discussion, using principles proposed by Milton & Dunleavy (2009) to monitor the level of engagement in the class environment.

In distance learning or online learning delivery, Dixson (2015) posited that engagement entails durations of students interacting with materials to produce new knowledge and skills. Hence, viewing content lectures and documents is one of the indications to observe learning behaviour that correlates with student engagement in the online learning environment. Based on this empirical finding, this study uses reports extracted from *Blackboard* to gain a quantitative understanding of how students spend time in using course content.

It is reported that student ratings change as they progress during the course of their study (Grebennikov & Skaines, 2009). The combination of using online materials and activities, face to face teaching and learning delivery, in-class learning activities, and flipping responsibilities to students produced a compelling need to gauge the level of satisfaction with the quality of the Business Computing course in terms of teaching and learning experiences. Oliver, Tucker, Gupta & Yeo (2008) designed and effectively implemented an overall satisfaction questionnaire with a course in order to measure student engagement. This study adopted an overall satisfaction index, which was extracted from course experience questions on a semester basis to gauge student engagement in general.

## Findings and discussion

### Student engagement through access to course content

Based on the *Blackboard* reports, the number of hits per hour followed a bell-curve shape, starting to rise by 9 am, reaching a peak at 5 pm and gradually decreasing by 9 pm (Figure 1). As the earliest class started 10 am and the last class finished at 3 pm, the LMS access statistics suggested that students were likely to access the course content after class. In addition, a Pearson correlation between the number of hours spent on LMS and class attendance showed a statistically significant relationship between frequencies of attendance and duration of using the LMS ( $r = 0.512$ ,  $p < .001$ ). In other words, the more a student attended class, the more time he or she spent on the *Blackboard* course content.

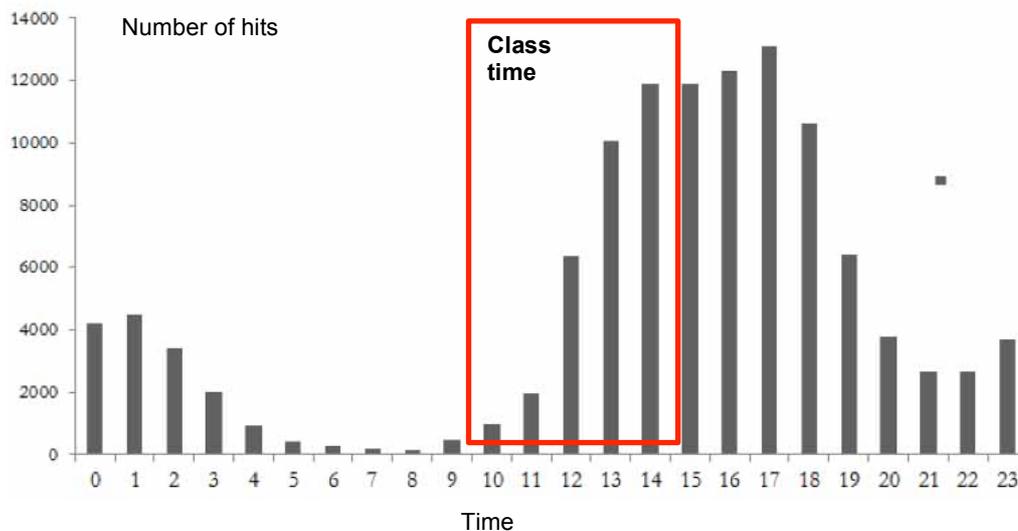


Figure 1: Total number of hits per hour for Semester 2, 2016

### Student engagement through attendance

Based on the descriptive observation from Table 2, the attendance frequency of those who engaged in the flipped classroom setting and used the newly designed materials throughout the duration of twelve weeks was higher than the frequency of the traditional classroom. For example, by Week 12, the percentage of students in Group 2 (67%) of the flipped classroom setting along with the introduction of new materials was double the figure for Group 1 (33%) in the traditional classroom. Furthermore, the rate of class attendance in semester 2, 2016 gradually went down while the drop-off rate for the traditional classroom plummeted from 86.67% to 33.33%. The finding indicates that students are more likely to be in favour of studying in the flipped classroom setting with the introduction of new learning materials, than the traditional one.

Table 2: Attendance monitoring for two Semesters in 2015 and 2016

Week	Traditional teaching setting				Flipped classroom and web-based platform			
	S3 2015, Group 1		S2 2016, Group 2		S3 2015, Group 3		S2 2016, Group 4	
	Actual/Total	%	Actual/Total	%	Actual/Total	%	Actual/Total	%
W1	26/30	87	27/30	90	24/30	80	24/33	73
W2	22/31	71	25/30	83	25/31	81	21/33	64
W3	20/30	67	29/30	97	26/30	87	23/33	70
W4	20/30	67	21/30	70	25/30	83	23/28	82
W5	17/30	57	21/30	70	20/30	67	17/28	61
W6	18/30	60	24/30	80	22/30	73	22/28	79
W7	Self-development activity							
W8	18/30	60	21/30	70	18/30	60	19/28	68
W9	14/30	47	24/30	80	17/30	57	19/28	68
W10	14/30	47	20/30	67	16/30	53	16/28	57
W11	10/30	33	16/30	53	16/30	53	16/28	57
W12	10/30	33	20/30	67	15/30	50	16/28	57

### Intellectual engagement through peer discussion

Following the suggestion proposed by Friesen cited in (Parsons & Taylor, 2011), the academic team followed the principle of establishing a partnership where students make efforts to intellectually engage in their learning sessions by actively constructing opinions, and contributing their ideas to build new prowess or to devise practices. This was conducted through in-class activity settings on which peer-discussions are predicated.

Initially, lecturers experienced great difficulty in applying the Socratic method in class due to a high prevalence of passive learners. In addition, students were not familiar with their lecturers, nor with numerous business concepts. Hence, it required a greater effort from lecturers to demonstrate their content knowledge through guided exploration, in order to encourage the students to engage with their peers. Gradually, students showed their engagement by posing various questions to both lecturers and peers. Some of their existing assumptions about the business world were revealed and heated debate ensued.

Showcases assisted students to develop critical thinking skills to solve a business-related problem while maintaining ethical behaviour. Examples of local business case studies were provided in group discussions to figure out ways to apply theories to solve issues. In return, students were stimulated to explore aspects of a given theory by themselves and subsequently share their new knowledge with their peers.

Lecturers' observations demonstrated that during peer discussions, students were more interested in exploring how to apply theories in different business scenarios, and were motivated and eager to discuss issues with lecturers when they considered them as part of their learning community. The qualitative feedback given in the course survey noted that students found explanations given by lecturers were interesting, and the setting in peer discussions was very helpful for them to communicate with one another.

### Overall satisfaction

The quantitative results were extracted from a student experience questionnaire completed by students enrolled in Business Computing for Semester 3, 2015 and Semester 2, 2016 (Table 3). While for Groups 1 and 2 the level of satisfaction in Semester 3, 2015 was 3.1% higher than Semester 2, 2016, for Flipped classroom there was significantly higher satisfaction in Semester 2, 2016 than in Semester 3, 2015. For example, student comments included, "learning materials are very applicable in real life context", and "group activities in class are very helpful to engage with other students".

Table 3: Overall satisfaction level between Semester 3, 2015 and Semester 2, 2016

	Traditional teaching setting		Flipped classroom and web-based platform	
	S3_2015, Group 1	S2_2016, Group 2	S3_2015, Group 3	S2_2016, Group 4
OSI	77.2%	74.1%	85.7%	100%

With regard to Groups 3 and 4, the overall satisfaction for flipped classroom was noticeably higher by 14.3% than in the traditional classroom setting. Moreover, all students in Group 4 were satisfied with the semester-long Business Computing. However, in terms of qualitative feedback, students did not give any measurable feedback in either semester.

### Association between time spent on LMS and academic performance

Prior to 2016, instructors did not have a means to monitor the use of teaching materials among students, as only slides and textbooks were in use. There was no evidence-based measure of the effectiveness of teaching materials for this core course, resulting in a situation where instructors could not assess the impact of teaching materials on learning styles and student performance. Since the implementation of newly designed materials, data from the LMS allows instructors to monitor whether students access the course materials or not, and to analyse correlations between the duration of accessing weekly materials on the LMS and the final academic score. Hence, the academic performance in

Semester 2, 2016 was extracted in order to ensure that there is a consistent improvement in the use of course content (Table 4). The range of academic performance for this course is from 0 to 100.

In Semester 2, 2016, 183 first-year students completed the course and the range of final scores was from 7 to 91 whilst the duration students browsed on the LMS was within the range 1.82 to 60.45 hours (Table 4). The Pearson correlation coefficient shows that there is a positive correlation between the time students spent on browsing the course materials and their academic performance in Semester 2, 2016 ( $p$ -values  $< 0.01$ ,  $r = .358$ ). This reflects the fact that the duration that a student spends on the LSM significantly and positively correlates with academic performance.

Table 4: Academic performance and hours on the LMS, Semester 2, 2016 (N=183)

	Minimum	Maximum	Mean	Std. dev.
Hours	1.82	60.45	20.74	11.29
Performance	7.00	91.00	70.03	13.14

## Conclusions

The design thinking approach in the re-design of course materials incorporated in the flipped classroom setting has underpinned the improvement in student engagement and academic performance in this study. This design gives academic professionals flexibility in developing suitable materials for different types of learners in a just-in-time manner. Lecturers have options to adjust their teaching materials within a semester after observing students in the first or second learning session, whilst keeping the consistency of the course content with different lectures of the course that are delivered by various lecturers. In return, students are more actively participating in peer discussions and developing a collaborative learning environment. The process of exploring ways to apply theories related to business into practice becomes more engaging when lecturers assign more responsibilities to students.

In addition, the weekly lecture duration has been shortened from 90 to 60 minutes, with the intended learning outcomes and course objectives remaining unchanged, in comparison to the traditional teaching approach. With reduced lecture length in flipped classroom class settings, the attendance rate in this study was higher than in the 90-minute lecture using old teaching materials. There are a number of studies that show shortened length of time in lecture sessions impacting on student satisfaction and engagement, especially lectures that are delivered online. For example, Ferguson & DeFelice (2000) found that the duration of course formats does not affect student satisfaction; a study by Bunce, Flens and Neiles (2010) suggested that there is no linkage between student engagement and durations of a lecture segment, but student attention remains in short cycles of a lecture session. Consistent with these findings, our study demonstrates that the duration of learning sessions has no negative impact on student attendance, even in the face to face teaching mode.

Based on the findings of the descriptive analysis, it emerges that students do use the learning materials outside of class time. This finding implies the usefulness of the course materials for student and their study. From the teachers' point of view, using the design thinking strategy whilst tailoring materials gives educators a better vision about students' learning patterns at a course level, and eventually leaves room for course improvement within a semester as well as in coming semesters, without imposing disruptive major changes.

In the *Empathy* stage, lecturers report that learners' perspective is not always incorporated into their teaching practice. This paves the way for making an assumption that students already know certain aspects of business situations, which might not nurture a conducive conversation amongst students, while guiding them to understand the nature of a problem. Moreover, understanding participants in class in order to develop a productive relationship is also another crucial element in motivating students' intellectual engagement.

In the *Define* stage, identifying what problems students might have in dealing with the application of theory is complex. Since some students have been fostered in one-way flows of information when learning in class, while others prefer to not expose their weakness in English language skills, or underestimate themselves in terms of knowledge creation, lecturers and designers are encouraged to exchange their roles in order to lay a better foundation for problem definition.

The *Ideate* stage presents challenges and debatable issues to designers, as it seeks to generate ideas and explore assorted videos from a pool of resources, to give students incentives for creativity. Incubation of ideas empowers the relationship between lecturers and students to promote a positive impact on student engagement in class. During this phase, designers open up dialogues with industrial experts and students to compile more ideas and to consult with teaching and learning experts to identify possible problems in classroom implementation. Besides, lecturers are required to share their experience on a regular basis to identify a common pattern among different cohorts of students. A description of peer discussion in classes and types of solutions suggested by students is reported to designers. This aims to achieve a better understanding of students and their preferences in learning.

The overall satisfaction levels of the course in subsequent semesters remained stable or slightly improved in comparison to Semester 2, 2016. Overall, the flipped classroom delivery was continued while refining the course contents until Semester 3, 2017. Afterwards, there were some changes in the class setting, though monitoring how lecturers delivered the course content and peer discussions in classroom could not be continued.

### **Limitations**

A limitation of this study is that the impact of each type of teaching materials, including video, text, visuals and games and their sequences on student engagement and academic

achievement has not been identified. In addition, the materials introduced in the flipped classroom setting were new, and lecturers of the course had not yet had the opportunity to identify the impact of the course content and its design on student performance.

## Acknowledgements

The authors gratefully acknowledge the support of the campus of RMIT University Vietnam in making use of data from the LMS and valuable suggestions of journal reviewers and editors. Also, thanks to Susan Thomas for proofreading the article.

## References

- Abeyskera, 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), 1-14. <https://doi.org/10.1080/07294360.2014.934336>
- Al-Samarraie, H., Selim, H. & Zaqout, F. (2016). The effect of content representation design principles on users' intuitive beliefs and use of e-learning systems. *Interactive Learning Environments*, 24(8), 1758-1777. <https://doi.org/10.1080/10494820.2015.1057739>
- Al-Zahrani, A. M. (2015). From passive to active: The impact of the flipped classroom through social learning platforms on higher education students' creative thinking. *British Journal of Educational Technology*, 46(6), 1133-1148. <https://doi.org/10.1111/bjet.12353>
- Alhamdani, W. A. (2016). Teaching cryptography using design thinking approach. *Journal of Applied Security Research*, 11(1), 78-89. <https://doi.org/10.1080/19361610.2015.1069646>
- Beaird, G., Geist, M. & Lewis, E. J. (2018). Design thinking: Opportunities for application in nursing education. *Nurse Education Today*, 64, 115-118. <https://doi.org/10.1016/J.NEDT.2018.02.007>
- Beckman, S. L. & Barry, M. (2007). Innovation as a learning process: Embedding design thinking. *California Management Review*, 50(1), 25-56. <https://doi.org/10.2307%2F41166415>
- Beghetto, R. A. & Kaufman, J. C. (2014). Classroom contexts for creativity. *High Ability Studies*, 25(1), 53-69. <https://doi.org/10.1080/13598139.2014.905247>
- Berardo, S. A. (2006). The use of authentic materials in the teaching of reading. *The Reading Matrix*, 6(2). <http://www.readingmatrix.com/articles/berardo/article.pdf>
- Bergmann, J. & Sams, A. (2012). *Flip your classroom: Reach every student in every class every day*. International Society for Technology in Education. <https://id.iste.org/connected/resources/product?id=2285>
- Biggs, J. & Tang, C. (2007). *Teaching for quality learning at university*. England and NY: Society for Research into Higher Education and Open University Press.
- Brockunier, E. D. (2016). *An investigation of creativity, engagement, and academic success using student-led lesson planning in one third grade classroom*. Honours thesis, University of Arkansas, USA. <http://scholarworks.uark.edu/cieduht/13>

- Bunce, D. M., Flens, E. A. & Neiles, K. Y. (2010). How long can students pay attention in class? A study of student attention decline using clickers. *Journal of Chemical Education*, 87(12), 1438-1443. <https://doi.org/10.1021/ed100409p>
- Cahen, H. A. (2008). Designing a curriculum in design thinking for creative problem solving users. In *Creative Studies Graduate Student Master's Projects*. Buffalo State University, USA. <http://creativity.buffalostate.edu/>
- CAST (2011). Learner variability and universal design for learning (Universal Design for Learning Series) [Video and presentation slides]. National Center on Universal Design for Learning. [http://udlseries.udlcenter.org/presentations/learner\\_variability.html?plist=explore](http://udlseries.udlcenter.org/presentations/learner_variability.html?plist=explore)
- Cheng, H., Andrade, H. L. & Yan, Z. (2016). A cross-cultural study of learning behaviours in the classroom: From a thinking style perspective. *Educational Psychology*, 31(7), 825-841. <https://doi.org/10.1080/01443410.2011.608526>
- Chou, D. C. (2018). Applying design thinking method to social entrepreneurship project. *Computer Standards & Interfaces*, 55, 73-79. <https://doi.org/10.1016/j.csi.2017.05.001>
- Davies, D., Jindal-Snape, D., Collier, C., Digby, R., Hay, P. & Howe, A. (2013). Creative learning environments in education—A systematic literature review. *Thinking Skills and Creativity*, 8, 80-91. <https://doi.org/10.1016/J.TSC.2012.07.004>
- Dixson, M. D. (2015). Measuring student engagement in the online course: The Online Student Engagement Scale (OSE). *Online Learning*, 19(4), 1-15. <https://files.eric.ed.gov/fulltext/EJ1079585.pdf>
- Dorst, K. (2011). The core of 'design thinking' and its application. *Design Studies*, 32(6), 521-532. <https://doi.org/10.1016/J.DESTUD.2011.07.006>
- Dorst, K. & Cross, N. (2001). Creativity in the design process: Co-evolution of problem-solution. *Design Studies*, 22(5), 425-437. [https://doi.org/10.1016/S0142-694X\(01\)00009-6](https://doi.org/10.1016/S0142-694X(01)00009-6)
- Dym, C. L., Agogino, A. M., Eris, O., Frey, D. D. & Leifer, L. J. (2005). Engineering design thinking, teaching, and learning. *Journal of Engineering Education*, 94(1), 103-120. <https://doi.org/10.1002/j.2168-9830.2005.tb00832.x>
- Fabri, M. (2015). Thinking with a new purpose: Lessons learned from teaching design thinking skills to creative technology students. In A. Marcus (Ed.), *Design, User Experience, and Usability: Design Discourse, 4th International Conference* (pp. 32-43). DUXU 2015. Lecture Notes in Computer Science, vol 9186. Springer, Cham. [https://doi.org/10.1007/978-3-319-20886-2\\_4](https://doi.org/10.1007/978-3-319-20886-2_4)
- Faridi, M. R., Arif, S. M. & Kumar, H. (2017). Mapping the terrain of business education. *International Review of Management and Marketing*, 7(1), 257-264. <https://econjournals.com/index.php/irmm/article/viewFile/3344/pdf>
- Ferguson, J. M. & DeFelice, A. E. (2000). Length of online course and student satisfaction, perceived learning, and academic performance. *International Review of Research in Open and Distance Learning*, 11(2), 73-84. <http://www.irrodl.org/index.php/irrodl/article/view/772/1557>
- Finch, D. J., Hamilton, L. K., Baldwin, R. & Zehner, M. (2013). An exploratory study of factors affecting undergraduate employability. *Education + Training*, 55(7), 681-704. <https://doi.org/10.1108/ET-07-2012-0077>

- Gilboy, M. B., Heinerichs, S. & Pazzaglia, G. (2015). Enhancing student engagement using the flipped classroom. *Journal of Nutrition Education and Behavior*, 47(1), 109-114. <https://doi.org/10.1016/J.JNEB.2014.08.008>
- Goodyear, P. (2005). Educational design and networked learning: Patterns, pattern languages and design practice. *Australasian Journal of Educational Technology*, 21(1), 82-101. <https://doi.org/10.14742/ajet.1344>
- Graham, C. R. (2006). Definition, current trends, and future directions. In C. J. Bonk & C. R. Graham (Eds.), *Handbook of blended learning: Global perspectives, local designs* (pp. 3-21). San Francisco: Pfeiffer Publishing.
- Hellsten, M. & Prescott, A. (2004). Learning at university: The international student experience. *International Education Journal*, 5(3), 344-351. <https://eric.ed.gov/?id=EJ903859>
- Henrie, C. R., Halverson, L. R. & Graham, C. R. (2015). Measuring student engagement in technology-mediated learning: A review. *Computers & Education*, 90(1 December), 36-53. <https://doi.org/10.1016/j.compedu.2015.09.005>
- Henriksen, D., Richardson, C. & Mehta, R. (2017). Design thinking: A creative approach to educational problems of practice. *Thinking Skills and Creativity*, 26(Dec), 140-153. <https://doi.org/10.1016/J.TSC.2017.10.001>
- Horwitz, E. K., Horwitz, M. B. & Cope, J. (1986). Foreign language classroom anxiety. *The Modern Language Journal*, 70(2), 125-132. <https://doi.org/10.2307/327317>
- Hung, B. P. (2014). Improving EFL classroom interaction by understanding students' learning styles. *International Journal of Language and Linguistics*, 2(6), 379-386. <https://doi.org/10.11648/j.ijll.20140206.17>
- Huong, P. L. & Fry, G. W. (2002). The emergence of private higher education in Vietnam: Challenges and opportunities. *Educational Research for Policy and Practice*, 1(1-2), 127-141. <https://doi.org/10.1023/A:1021130320485>
- Huq, A. & Gilbert, D. (2017). All the world's a stage: Transforming entrepreneurship education through design thinking. *Education + Training*, 59(2), 155-170. <https://doi.org/10.1108/ET-12-2015-0111>
- Hussey, H. D., Fleck, B. K. B. & Richmond, A. S. (2014). Promoting active learning through a flipped course design. In J. Keengwe, G. Onchwari & J. N. Oigara (Eds.), *Promoting active learning through the flipped classroom model* (pp. 23-46). Hershey, Pennsylvania: IGI Global. <https://doi.org/10.4018/978-1-4666-4987-3>
- Jindal-Snape, D., Davies, D., Collier, C., Howe, A., Digby, R. & Hay, P. (2013). The impact of creative learning environments on learners: A systematic literature review. *Improving Schools*, 16(1), 21-31. <https://doi.org/10.1177/1365480213478461>
- Kimbell, L. (2011). Rethinking design thinking: Part I. *Design and Culture*, 3(3), 285-306. <https://doi.org/10.2752/175470811X13071166525216>
- King, A. (1990). Enhancing peer interaction and learning in the classroom through reciprocal questioning. *American Educational Research Journal*, 27(4), 664-687. <https://doi.org/10.3102/00028312027004664>
- Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*. London: Prentice-Hall.
- Krause, K. & Coates, H. (2008). Students' engagement in first-year university. *Assessment & Evaluation in Higher Education*, 33(5), 493-505. <https://doi.org/10.1080/02602930701698892>

- Lau, K. H., Lam, T., Kam, B. H., Nkhoma, M., Richardson, J. & Thomas, S. (2018). The role of textbook learning resources in e-learning: A taxonomic study. *Computers & Education*, 118(March), 10-24. <https://doi.org/10.1016/j.compedu.2017.11.005>
- Littlewood, W. W. (2000). Do Asian students really want to listen and obey? *ELT Journal*, 54(1), 31-36. <https://doi.org/10.1093/elt/54.1.31>
- Lo, C. K. & Hew, K. F. (2017). A critical review of flipped classroom challenges in K-12 education: Possible solutions and recommendations for future research. *Research and Practice in Technology Enhanced Learning*, 12:4. <https://doi.org/10.1186/s41039-016-0044-2>
- Luong, G. T. H. (2016). *Achieving change in student assessment in Vietnamese teacher training institutions*. PhD thesis, Southern Cross University. <http://epubs.scu.edu.au/cgi/viewcontent.cgi?article=1482&context=theses>
- Luria, S. R., Sriraman, B. & Kaufman, J. C. (2017). Enhancing equity in the classroom by teaching for mathematical creativity. *ZDM Mathematics Education*, 49(7), 1033-1039. <https://doi.org/10.1007/s11858-017-0892-2>
- Lyons, A., Reysen, S. & Pierce, L. (2012). Video lecture format, student technological efficacy, and social presence in online courses. *Computers in Human Behavior*, 28(1), 181-186. <https://doi.org/10.1016/J.CHB.2011.08.025>
- Macgregor, A. & Folinazzo, G. (2018). Best practices in teaching international students in higher education: Issues and strategies. *TESOL Journal*, 9(2), 299-329. <https://doi.org/10.1002/tesj.324>
- Maley, A. & Kiss, T. (2018). Creativity in materials and resources. In *Creativity and English Language Teaching* (pp. 125-135). London: Palgrave Macmillan. [https://doi.org/10.1057/978-1-137-46729-4\\_6](https://doi.org/10.1057/978-1-137-46729-4_6)
- Mann, E. L. (2006). Creativity: The essence of mathematics. *Journal for the Education of the Gifted*, 30(2), 236-260. <https://doi.org/10.4219/jeg-2006-264>
- Martin, R. L. (2009). *The design of business: Why design thinking is the next competitive advantage*. Harvard Business Press. <https://hbr.org/product/the-design-of-business-why-design-thinking-is-the-next-competitive-advantage/12176-HBK-ENG>
- McIntyre, F. S., Hite, R. E. & Rickard, M. K. (2003). Individual characteristics and creativity in the marketing classroom: Exploratory insights. *Journal of Marketing Education*, 25(2), 143-149. <https://doi.org/10.1177/0273475303254014>
- McLaughlin, J. E., Roth, M. T., Glatt, D. M., Gharkholonarehe, N., Davidson, C. A., Griffin, L. M., Esserman, D. & Mumper, R. J. (2014). The flipped classroom: A course redesign to foster learning and engagement in a health professions school. *Academic Medicine*, 89(2), 236-243. <https://doi.org/10.1097/ACM.0000000000000086>
- Milton, P. & Dunleavy, J. (2009). *What did you do in school today? Exploring the concept of student engagement and its implications for teaching and learning in Canada*. Toronto: EdCan Network. <https://www.edcan.ca/articles/what-did-you-do-in-school-today-exploring-the-concept-of-student-engagement-and-its-implications-for-teaching-and-learning-in-canada/>
- Missildine, K., Fountain, R., Summers, L. & Gosselin, K. (2013). Flipping the classroom to improve student performance and satisfaction. *Journal of Nursing Education*, 52(10), 597-599. <https://doi.org/10.3928/01484834-20130919-03>
- Nguyen, C. T. (2012). *Case studies of Vietnamese tertiary students' learning in Australia*. EdD thesis, La Trobe University, Australia. <http://arrow.latrobe.edu.au/store/3/4/8/7/5/public/MasterVersion.pdf>

- Nguyen, H. T. M. (2011). Primary English language education policy in Vietnam: Insights from implementation. *Current Issues in Language Planning*, 12(2), 225-249. <https://doi.org/10.1080/14664208.2011.597048>
- Oliver, B., Tucker, B., Gupta, R. & Yeo, S. (2008). eVALUate: An evaluation instrument for measuring students' perceptions of their engagement and learning outcomes. *Assessment & Evaluation in Higher Education*, 33(6), 619-630. <https://doi.org/10.1080/02602930701773034>
- Owen, C. (1998). Design research: Building the knowledge base. *Design Studies*, 19(1), 9-20. <https://www.sciencedirect.com/science/article/pii/S0142694X97000306> [also at [https://id.iit.edu/wp-content/uploads/2015/03/Design-researching-building-the-knowledge-base-Owen\\_desstud97.pdf](https://id.iit.edu/wp-content/uploads/2015/03/Design-researching-building-the-knowledge-base-Owen_desstud97.pdf)]
- Parsons, J. & Taylor, L. (2011). Improving student engagement. *Current Issues in Education*, 14(1), 1-32. <https://cie.asu.edu/ojs/index.php/cieatasu/article/view/745>
- Peterson, R. & Pratt, E. (2004). The history sphere in MBA. Marketing instruction: An application. *Marketing Education Review*, 14(2), 55-67. <https://doi.org/10.1080/10528008.2004.11488868>
- Philp, J. & Duchesne, S. (2016). Exploring engagement in tasks in the language classroom. *Annual Review of Applied Linguistics*, 36, 50-72. <http://dx.doi.org/10.1017/S0267190515000094>
- Rauth, I., Köppen, E., Jobst, B. & Meinel, C. (2010). Design thinking: An educational model towards creative confidence. In *Proceedings of the 1st International Conference on Design Creativity (ICDC2010)* (pp. 1-9). Kobe, Japan. <https://www.designsociety.org/publication/30267/Design+Thinking%3A+An+Educational+Model+towards+Creative+Confidence>
- RMIT (2018). Business Computing 1 - RMIT University. [viewed 17 March 2018] <http://www1.rmit.edu.au/courses/002907>
- Roberts, J. P., Fisher, T. R., Trowbridge, M. J. & Bent, C. (2016). A design thinking framework for healthcare management and innovation. *Healthcare*, 4(1), 11-14. <https://doi.org/10.1016/j.hjdsi.2015.12.002>
- Schussler, D. L. (2009). Beyond content: How teachers manage classrooms to facilitate intellectual engagement for disengaged students. *Theory Into Practice*, 48(2), 114-121. <https://doi.org/10.1080/00405840902776376>
- Stewart, M., Stott, T. & Nuttall, A.-M. (2011). Student engagement patterns over the duration of Level 1 and Level 3 Geography Modules: Influences on student attendance, performance and use of online resources. *Journal of Geography in Higher Education*, 35(1), 47-65. <https://doi.org/10.1080/03098265.2010.498880>
- Supalak, N. (2016). Comparative exploration of learning styles and teaching techniques between Thai and Vietnamese EFL students and instructors. *Journal of Language and Cultural Education*, 4(3), 103-141. <https://doi.org/10.1515/jolace-2016-0028>
- Takahashi, S. & Saito, E. (2013). Unraveling the process and meaning of problem-based learning experiences. *Higher Education*, 66(6), 693-706. <https://doi.org/10.1007/s10734-013-9629-5>
- Thai, N. T. T., De Wever, B. & Valcke, M. (2017). The impact of a flipped classroom design on learning performance in higher education: Looking for the best “blend” of lectures and guiding questions with feedback. *Computers & Education*, 107(April), 113-126. <https://doi.org/10.1016/j.compedu.2017.01.003>

- Thao-Do, T. P., Bac-Ly, D. T. & Yuenyong, C. (2016). Learning environment in Vietnamese physics teacher education programme through the lens of constructivism: A case study of a state university in Mekong Delta Region, Vietnam. *International Journal of Science and Mathematics Education*, 14(S1), 55-79.  
<https://doi.org/10.1007/s10763-014-9585-2>
- Toto, R. & Nguyen, H. (2009). Flipping the work design in an industrial engineering course. In *Proceedings of the 39th IEEE international conference on Frontiers in Education* (pp. 1066-1069). Piscataway, NJ, USA: IEEE. <https://doi.org/10.1109/FIE.2009.5350529>
- Tran, T. T. (2013). Limitation on the development of skills in higher education in Vietnam. *Higher Education*, 65(5), 631-644. <https://doi.org/10.1007/s10734-012-9567-7>
- Tuan, L. T. (2011). EFL Learners' learning styles and their attributes. *Mediterranean Journal of Social Sciences*, 2(2). <http://www.mcseser.org/index.php/mjss-vol-2-no-2-may-2011/116-efl-learners-learning-styles-and-their-attributes>
- Tune, J. D., Sturek, M. & Basile, D. P. (2013). Flipped classroom model improves graduate student performance in cardiovascular, respiratory, and renal physiology. *Advances in Physiology Education*, 37(4), 316-320.  
<https://doi.org/10.1152/advan.00091.2013>
- Veiga, F., Goulão, F., Bahia, S. & Galvão, D. (2014). Students' engagement in school and creativity professed by students and assigned to teachers: A literature review. In *Atas do I Congresso Internacional Envolvimento dos alunos na escola: perspectivas da psicologia e educação* (pp. 361-372). Instituto de Educação da Universidade de Lisboa. Retrieved from [http://repositorio.ul.pt/bitstream/10451/18037/1/E-Book\\_ICIEAE\\_creativity\\_professed\\_by\\_students.pdf](http://repositorio.ul.pt/bitstream/10451/18037/1/E-Book_ICIEAE_creativity_professed_by_students.pdf)
- Wrigley, C. & Straker, K. (2015). Design thinking pedagogy: The educational design ladder. *Innovations in Education and Teaching International*, 54(4), 374-385.  
<https://doi.org/10.1080/14703297.2015.1108214>
- Yang, Y.-T. C., Newby, T. J. & Bill, R. L. (2005). Using socratic questioning to promote critical thinking skills through asynchronous discussion forums in distance learning environments. *American Journal of Distance Education*, 19(3), 163-181.  
[https://doi.org/10.1207/s15389286ajde1903\\_4](https://doi.org/10.1207/s15389286ajde1903_4)
- Yao, C. W. & Collins, C. (2018). Perspectives from graduate students on effective teaching methods: A case study from a Vietnamese transnational university. *Journal of Further and Higher Education*, 1-16. <https://doi.org/10.1080/0309877X.2018.1429583>

**Ashish K. Das** is currently head of the Research and Development Department, Infinity Blockchain Labs. He possesses more than 12 years of work experience in the software development industry in USA, holding software and solutions architect and program manager positions in various Fortune 500 companies and start-ups.  
 Email: 2018.research.work@gmail.com

**Dr Quynh T. Nguyen**, Department of Management, School of Business and Management, RMIT University Vietnam, Ho Chi Minh City, Vietnam, is a certified IBM SPSS Modeler specialist and data analyst. She obtained a Masters degree (with Distinction) and a PhD from Coventry University, UK, in 2007 and 2016, respectively. She has published nearly 40 papers in peer reviewed journals and conferences.

Email: [nguyentqbio@gmail.com](mailto:nguyentqbio@gmail.com), [quynh.nguyenthi@rmit.edu.vn](mailto:quynh.nguyenthi@rmit.edu.vn)  
Web: <https://www.rmit.edu.vn/profiles/academic/quynh-t-nguyen>

**An T. Nguyen** graduated from RMIT University Vietnam as the Valedictorian and recipient of RMIT Presidents Award in her cohort. She is finishing her Masters degree at the Department of Marketing, University of Otago, as a New Zealand Aid Scholar. Her research interests are value co-creation in education service and sustainable consumption.

Email: [annguyen23808@gmail.com](mailto:annguyen23808@gmail.com)

**Milton Nomikoudis** has over 20 years of experience working in universities in many roles including teacher, project manager, senior advisor on learning and teaching, and now independent consultant.

Email: [nomikoudis.m@gmail.com](mailto:nomikoudis.m@gmail.com)

**Dr Dung Ha Van** received his doctoral degree in economics from the University of Paderborn, Germany in 2014. He is currently with the International Economics Faculty, Banking University of Ho Chi Minh City, Vietnam.

Email: [dunghv@buh.edu.vn](mailto:dunghv@buh.edu.vn)

**Please cite as:** Das, A. K., Nguyen, Q. T., Nguyen, A. T., Nomikoudis, M. & Dung, H. V. (2019). Course redesign to incorporate flipped delivery: A business degree case in Vietnam. *Issues in Educational Research*, 29(2), 363-383.

<http://www.iier.org.au/iier29/das.pdf>