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FLIPPING BUSINESS COMPUTING CLASS: AN INTEGRATION OF DESIGN THINKING AND BLENDED IMPLEMENTATION IN THE VIETNAMESE EDUCATIONAL CULTURE

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ABSTRACT

Aim/Purpose	This study aims to provide a description of how flipped classroom was designed in the Business Computing (BC) course in order to adapt with the changes in the Vietnamese students' learning needs, as well as social and technological developments that disrupt student' behaviours and living styles.
Background	<p>The flipped classroom (FC) model is widely implemented, especially in the English language classes due to an immensely high demand in the Vietnamese market. However, there has not been any imperative published research on the impact of using FC models on higher education in Vietnam.</p> <p>The BC course was implemented the FC model across the Royal Melbourne Institute of Technology (RMIT) University's campuses. The idea of using this model was to adapt with changes in social and technological developments.</p>
Methodology	A comprehensive literature related to the common pedagogy in practice in Vietnam was provided. This helped the design team of the BC course to understand the characteristics of the Vietnamese students and subsequently, offer a suitable flipped model that improves student's engagement. A proposed method of using the design thinking (DT) approach while flipping a BC class was underlined.

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Contribution	The outcome of this study assists national educators in Vietnam to confidently embrace the FC concept as a model for pedagogical modernisation and advocate the real need to provide a dynamic learning environment.
Findings	The initial conclusion showed that there is an existence of preparation for student's study, especially during post-class periods.
Recommendations for Practitioners	It is vital to conduct a rigorous student's need and their learning styles before designing learning contents that matches with course learning outcomes.
Recommendations for Researchers	In order to increase student's engagement with the course content and materials, educators and designers may explore a combination of multimedia, pictures and narrative sources to enrich learning sessions while simplifying theoretical concepts.
Impact on Society	Utilizing advanced technologies in teaching gives students advantages to interact and gain other skills that meet the demands of potential employers.
Keywords	flipped classroom, learning styles, design thinking and student centric learning

CLASSICAL LEARNING STYLE AMIDST LEARNERS IN VIETNAM

In Vietnam, since the “Doi moi” reform policy was applied in 1986, the traditional classroom structure has dominantly been the focal pedagogy in practice, from high schools to universities (Huong & Fry, 2002). The learning journey of Vietnamese students has attached with them the passive and dependent learning style, where the focus essentially is on the role of teachers and lecturers and their preference in the lecture modality (Thao-Do, Bac-Ly, & Yuenyong, 2016). The preference is influenced by the traditional norm in which the Vietnamese teachers and lecturers are believed to play an important role as the central gravity of knowledge and the usage of digital learning materials from various sources as well as peer-discussions are not encouraged in the Vietnamese educational environment. In a classroom setting, students are expected to watch and listen whilst lecturers deliver instructions. As a result, students inherently develop an unquestioning behaviour, are obedient and are prone to traditional skill-based instructions (Littlewood, 2000).

Due to an easy access to the Internet, the sub-set of populace, including schoolchildren and students are regularly exposed to social media and prone to use digital learning sources for their informal trainings whilst maintaining their traditional learning styles in the classroom. Gradually, this tendency disrupts the traditional learning styles of young Vietnamese and emerges changes in the demand for new educational perspectives. This change can be demonstrated through a recent study by Supalak (2016) where the results showed a pattern for processing active learning styles among Vietnamese students (Supalak, 2016).

Recently, various Vietnamese schools and universities have adopted the changes by implementing modern learning, including various FC models that improve learners' engagement. A primary school in Ho Chi Minh City is reported to have used a group discussion in-class in order to advocate the role of peer instruction amongst classmates (Asia News Monitor, 2009). However, various private schools and universities appear to spontaneously apply these modern teaching techniques without understanding the real needs of learners across different age groups.

BC is one of the core eight courses in the Business degree program at RMIT, Vietnam, which is an offshore campus of its Australian counterpart and has campuses in Saigon and Hanoi (Gruba, Cárdenas-Claros, Suvorov, & Rick, 2016). The BC course has recently introduced a student-centred mode, using the FC model. This change occurred due to an urgent need to re-design course content in order to enrich the learners' experience in the classroom while being in-line with the institutional policy of creating a digital learning environment. The overall outcome of applying FC in this particu-

lar course is to provide an active and dynamic learning environment in the classroom through the utilisation of existing advanced technologies, and subsequently, to improve students' academic performance and classroom engagement.

In addition, through a vigorous search on EBSCO, Emerald, Google Scholar, InformIt, ProQuest, Research Gate and SAGE from the period of "Doi moi" policy which was implemented in 1986 to 2016, no articles related to the design and implementation on FC models in Vietnam is found whilst 8 related articles that are conducted in many Asian countries, such as China, Malaysia and Singapore are available. Hence, the main aim of this study is to provide a compendious narrative of the process of re-designing the undergraduate BC course based on a well-established framework for FC, whilst using online learning management system, LMS as a digital platform to facilitate the student-centric learning.

FLIPPED CLASSROOM IN VIETNAM

Based on the systematic review of the above digital repositories, it is perceived that FC and flipped learning appear to remain as a relatively new concept in the Vietnamese educational industry. Although it is observed that the national academic institutions, including international universities, have adopted FC models, researches on applying a FC pedagogy are still limited. For instance, in the areas of technological science, University of Technology and Science, Ho Chi Minh City University of Technology and Education and the University of Da Nang reported to experimentally have flipped some of their classrooms. However, there is no report to be found about the effectiveness of FC models in relation to academic performance and students' engagement (Dzung, 2015; Nguyen, 2016). In addition, amongst 21 national private universities in Vietnam, the FPT University introduced and applied flipped learning in some sessions of a total of four (4) classes. The result showed some academic improvements as well as an indication of student's positive attitude towards FC (Huong & Fry, 2002; Pham, 2014). However, a detail description of how the class was flipped was not provided. This reduces the reliability of the FC report and as a result, a solid indication related to an overall impact on a larger populace cannot be drawn. In contrast, the FC method is widely implemented in private and foreign and English language training centres, such as Aroma and Enkulu. This may be because these centres are not under the watch list of the Vietnamese Ministry of Education whilst larger and private academic institutions and providers are required to abide by the laws to ascertain quality assurance in order to lawfully operate in the country.

FLIPPED CLASSROOM DEFINITION

The common feature of a 'flipped classroom' is the 'flipping' in the traditional purposes of in-class and out-of-class time. Structurally, traditional in-class activity is scheduled prior to the class and conducted by student's own space and time, whilst problem-solving activities are considered as 'homework' in the standard class format (Stockwell et al., 2015). This key theme can be tailored to many forms in practice with a degree of flexibility in the course design. A typical way of implementing a FC model is to involve 'blended learning', a method that integrates online materials into the face-to-face delivery mode and has been showed to be more effective than either purely face-to-face or online method (Means, Toyama, Murphy, Bakia, & Jones, 2009; Stockwell, Stockwell, Cennamo, & Jiang, 2015).

Moore, Gillett, and Steele (2014) reported that the formation of the FC concept was brought up as early as the 1990s by Mazur, a Harvard professor who advocated for moving the lecturing content outside of the class to utilizing in-class time for application of learning (Crouch & Mazur, 2001). The FC has subsequently been adopted sparsely in K-12 schooling and recently gained interests in higher education (O'Flaherty & Phillips, 2015). Scholars have endorsed the flipped method for its potential to overcome the limitation of the traditional classroom and for being a timely motion to suffice the learning needs of the Millennial students (Basal, 2015; Roehl, Reddy, & Shannon, 2013).

DESIGN THINKING CONCEPT AND PROCESS

Nowadays, since students have a tendency to use digital resources to integrate their existing knowledge, educators experienced the landscape where technological development could completely disrupt student's manner (Christensen, Michael, & Johnson, 2011). This leads to an urgent demand to revamp and re-design curriculum, courses and teaching resources, and the largest challenges for educators lies in the fact that how to design various programs that could provide appropriate skills for graduates whilst maintaining engagement in-class as well as increasing an active role of students. As DT models take the student perspectives as the centric initiative into design innovative outcomes, there is an obvious increasing number of academic designer adopted DT steps and approaches to re-develop graduate capabilities, curriculum, course and resources (Bonini & Sbragia, 2011; Wrigley & Straker, 2015). However, integrating DT into education can be challenging to designers. Stanford University suggested a 5-steps framework of DT, which includes empathize, define, ideate, prototype, and test phases, with the aim of finding solutions to problems (Fabri, 2015).

Chronologically, DT has gone through a number of developments and transformations. According to Beckman and Barry (2007), initially, DT is taken into consideration when the problem is rather convoluted, and designers tend to dissect and break the problem into smaller pieces and well-defined sub-categories in order to consult experts in each field to solve those sub-problems. In the transition, DT moved to another stage, from problem-solving to a problem-formulating process where DT allows designers to utilise effective resources in solving problems.

Since the shift from the teacher- to student-centred occurred, the apple of educator's eyes heavily focuses on learning experience. As a result, Kolb (1984) developed "experimental learning theory" of which "knowledge is created through the transformation of experience." In his theory, learning process includes four chains: experience, reflecting, thinking, and acting which are iterated and refined with time. From another front, Owen (1993) proposed a model of DT from the perspective of design as a process of knowledge development. The model highlights two main components, analytics and synthesis which synchronise in practical and theoretical rhythms. As part of the analytic phase, participants aim at finding and discovery and the invention process arises in the synthetic stage.

Indeed, Stanford's framework, Kolb's theory and Owen's model provide some similar in terms of how to implement DT into developing curriculum, courses and teaching resources. Hence, some scholars have combined these frameworks and theories into innovating their teaching models. Beckman and Barry M (2007), as an example, succeeded in integrating Kolb's theory and Owen's model for smoothly structuring an innovation team. Other academic teams across universities applied DT frameworks in a curriculum, assessments and educational technologies design.

FLIPPED CLASSROOM MODEL

While the traditional classroom is widely practised in developing countries, including Vietnam, academic institutions have endeavoured effortlessly to promote innovative initiatives in order to distinguish their education and improve students' satisfaction (McCallum, Schultz, Sellke, & Spartz, 2015; O'Flaherty & Phillips, 2015). The flipped classroom approach has received more interests from college educators in recent years as a solution to enhance student engagement and eventually lead to better learning outcome. By reversing the conventional order of a lecture format, followed by homework, the FC model changes the dynamics of learning to potentially resolve the difficulties in traditional teacher-centred delivery method due to the passive role played by students (Andrews, Leonard, Colgrove, & Kalinowski, 2011).

FC IMPLEMENTATION IN HIGHER EDUCATION SETTING

Despite its gaining popularity, the implementation and critical assessment of FC in higher education has not been well-documented. In 2015, O'Flaherty and Philips presented a roundup of peer-reviewed studies on FC in college educations. After a comprehensive searching and screening process

on the above listed digital repositories, they narrowed down to 28 studies on FC's application in college teaching across disciplines, for students at different levels in college education. The majority of these studies were conducted in the US, with a few in UK, Australia, Malaysia and Taiwan. Among the selected publications, several showed positive improvement in students' engagement (Ferreri & O'Connor, 2013; Missildine, Fountain, Summers, & Gosselin, 2013; Papadopoulos & Roman, 2010; Wilson, 2013). In a more recent study by Gross, Pietri, Anderson, Moyano-Camihort, and Graham (2015), who compared students' performance with the satisfaction survey data in five academic years and FC was applied in the two most recent years, the authors found that the new pedagogy enhances performance, specifically for students who are likely to underperform in standard class format, such as female students in male-oriented life science subjects and students with a history of low GPA. Yet in some cases, there are no differences in grades such as McLaughlin et al. (2014) for a pharmacy course, Findlay-Thompson & Mombourquette (2014) conducted examination of an introduction to business course, and findings from the study by Davies, Dean, and Ball (2013) for an introductory information systems course.

From a similar vein, the scholars from Harvard School of Dental Medicine developed a FC model where a combination of instructional technology and flipping the sequence in which students use online learning materials prior to the classroom schedule and subsequently discuss during class time (Park & Howell, 2015). After implementing this FC model, the result of the survey emerged, showing that the majority of attendees (85%) expressed to have a positive experience in the FC setting for the pre-doctoral dental curriculum.

APPLIED FC MODEL FOR THE BC COURSE

RMIT University, Vietnam foresaw an urgent need to transform the traditional classroom and teacher-centred learning approach to a digital learning environment incorporating a dynamic and experimental and transformative learning style. The change from passive learning to active learning cycle is also described by Kolb, highlighted by cycle of learning (Kolb, 1984). The FC model was re-designed and implemented for the first and second year undergraduate students enrolled in the BC course from semester 1, 2016 onwards. The BC course is one of the eight common core courses for the Bachelor of Business degree course and, hence, has high number of enrolments which ranges from 200 to 500 students per semester. The student engagement concept in this study was adopted by using the model proposed by Finn & Zimmer (2012) which academic engagement is referred as in-class.

OBJECTIVES

By using the blended learning framework from Harvard School of Dental Medicine (Park & Howell, 2015) and the DT approach, the BC course structure and format, and teaching materials were re-tailored and re-developed with the main objectives of obtaining a better engagement in class and a higher order thinking level, including applying, analysing and evaluating through enhancing student self-study and -preparation.

METHODOLOGY AND RE-DESIGN DESCRIPTIONS

Students' observation in the classroom was utilised in this study. Adopting the participant observation method is the step to obtain changes in student's engagement. This enables academic professionals who involved in teaching the BC course to learn more about student's patterns in the class activities (Kawulich, 2005).

The academic professionals of the course observed two different cohorts of students and concluded that increasing their peer-discussion as well as enriching the teaching and learning materials along with various format of assessments paved the way in achieving the outlined objectives. Although processing the DT approach in designing teaching materials enables learners to actively interact and

obtain knowledge, the key question lies in the content and delivery of the course (Wrigley & Straker, 2015). Hence, the team endeavoured to flip the BC class by incorporating DT into re-designing processes. Figure 1 describes four steps of DT in developing a systematic strategy for implementing a feasible FC model that is integrated with an online Learning Management System.

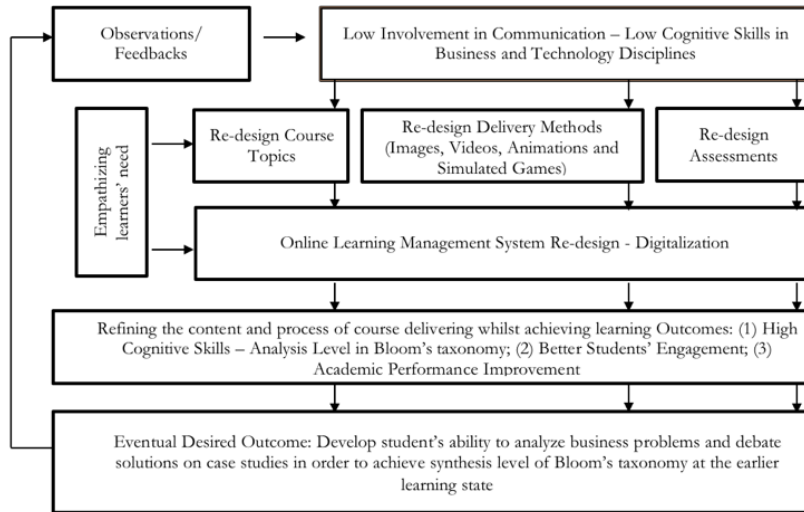


Figure 1. Framework of Re-Design Process of BC Course

In the traditional model of the BC course, a lecture lasts 90 minutes which academic professionals continuously explain related concepts and theories whilst using slides, and subsequently, examples are given to demonstrate how theories are applied. In the flipped mode, slides are replaced by concise and short narratives that explain the core knowledge along with images, videos, and animations. Each lecture lasts 60-minutes and is structured by a list of topics, or sub-sections that cover weekly intended learning outcomes. Each topic carries different weight which is converted to percentile and eventually contributes to 100% after attendees complete their lecture. Furthermore, each topic is designed to have from one to four pre-recorded videos. The duration of each video is varied from approximately one to ten minutes. The variation in duration is conceptualised based on findings from Guo (2013) reported that students retain their focus on videos with a length of an average of three to nine minutes (Guo, 2013). In total, there are 34 videos, 1 simulated game, and 22 images. Whilst designing the videos and animation, in order to nurture student’s empathy, the academic team applied the depth of their experience in teaching the Vietnamese students into identifying patterns and perceptions towards types of videos, annotation, and lexicology. Subsequently, brainstorming and mapping steps on possible and suitable resources are processed.

When the flipped learning format was first implemented in the semester 1 in 2016, the frequency of classes occurs on a weekly basis with duration of 60 minutes of in-class activity and of 120 minutes of practising technological and analytical skills in laboratory rooms. All topics are outlined on the University’s LMS. Students are given a course guide at the beginning of their course enrolment in order to capture the structures as well as the course learning outcomes.

Regarding pre-class activities, students are assigned to remember theoretical concepts that are described and posted on the LMS along with textbook readings. Also, they are encouraged to explore other digital materials that are useful and stimulate their cognitive awareness. The learning material for this session is designed to outlay a foundation for logical connections between business and technology concepts and to prepare a constructive argument. According to McLaughlin and colleagues, students who prepared at home have higher tendency to engage activities in the classroom than those who did not (McLaughlin & Rhoney, 2015). Hence, the academic professionals of the BC course

constantly remind students to perform their supposed tasks at their own pace and time prior to the in-class session. However, this reminder becomes a hurdle, since the Vietnamese students are familiar with being given details of instructions as what to study. This situation is proved by another study where teachers and students have been exposed to traditional and long-term approaches to teacher-centred strategy (McLaughlin, White, Khanova, & Yuriev, 2016).

In relation to the in-class session, to start with, students are given a clear expectation about underlined deliverables for that lecture, and academic professionals revise learning materials of the intended pre-class activities with students in order to develop connections between pre- and in-class activities. In addition, activities that develop problem-solving skills to reinforce learning through peer-discussion are provided and guided. As a sequel, students are assigned to explore possible aspects of problems and alternatives to solutions and subsequently, students work in pair to express their understanding, develop debatable conversations and differentiate concepts and prioritize applicable situations. Appropriate narratives and multi-media resources in terms of content, duration and scope of topics are selected and blended inside the lecture's contents.

With regards to the post-class period, a concise narrative along with videos is posted for student to perform self-study. This is to address any misconceptions, if exists, and to strengthen their learning foundation. Quizzes of two questions and formative feedback are adopted to evaluate students' prowess that are delivered in their class. Since the nature of the course is related to what is going on in the real world, some up-to-date supplement reading materials are recommended, aiming at widening students' knowledge.

Activities in laboratories are designed to support and scaffold students' intellectual knowledge and familiarize with complex problems and business situations. Students retain their 120 minutes to discuss, perform and debug technical problems in both business and technology. A case study is exploited in order to constructively assign with the intended learning outcomes.

DISCUSSION

Based on the observation in the classroom, as the majority of participants embarked on the business-related programs and the instructions are oriented towards extroverts, which generally require students to engage in peer-discussions and develop problem-solving questions, the participants showed to have diverse learning approaches, interests and strengths. This means that students who enrol in business oriented courses carry a number of learning style preferences, including auditory, and kinesthetic and tactile. This observation is also in line with the two separated studies that were conducted by Tuan in 2011 and Hung in 2014 (Hung, 2014; Tuan, 2011). Subsequently, there is a need to develop an environment where multi- learning styles are nurtured and harmonized.

The academic professionals spent a period of 11-months to re-design and revamp the materials for the course whilst applying DT approach. As a result, the academic professionals, who were heavily involved in the designing stage, reported a significant challenge as how to constructively align the structure of topics to intended learning outcomes when the team allocated 50% of the whole designing stage to decipher Power Point slides into itemized topics. Recorded videos and annotations, and development of animation clips are another hurdle that the team overcame because there were ample materials available which are related to the topics of the course but there was a limited understanding of the effectiveness of the articles and digital materials on student's engagement.

The Blackboard Course Reports showed that students accessed to the learning materials after completing their classes. The peak time when students used the digital course contents was at 5:00 o'clock and gradually decreased by 9:00 o'clock at night.

LIMITATIONS AND FUTURE RESEARCH

Within the scope of this study, the main limitation is that the study has not yet included the evaluation of student's academic performance in comparison to the traditional teacher-centred approach. Hence, future research can fill the gap. This will enable to test the impacts of an integration between the DT approach and the FC model on a higher level of cognitive skills of Bloom's taxonomy.

The above limitations can be taken into consideration whilst developing a larger scale of research in the near future. A number of actions is necessary to take into account for a future research, such as (1): an investigation on the pattern of pre- and post-class activities among students in order to develop a better teaching material that promote self-learning amongst 3 segments, pre-, in- and post-class sessions in the Vietnam context; (2) an identification of a large sample size that is observed during three semesters of a year might enrich more findings and be able to conduct a concrete conclusion about the effectiveness of FC in the BC course; (3) since the FC models are varied in its implementation, it is necessary to investigate the effect of different teaching materials on student's engagement and their academic performance. In the case of this study, whilst the BC course was revamped, the academic professionals applied DT principles in order to boost up engagements amongst students who are familiar with the passive teaching and learning environment.

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