THE CHINESE UNIVERSITY OF HONG KONG

Micro-Module Courseware Development Grant

Scheme 3: eLearning Pedagogy Research

Final Report (2016-17)

Report due 30 April 2018
Please return by email to The Ad hoc Committee on Planning of eLearning Infrastructure mmcd@cuhk.edu.hk

PART I

Project title: **T&L Effectiveness of Micro-modules in Economics and Finance Courses at Undergraduate and Postgraduate Business Programs**

Principal supervisor: Dr. Andrew Yuen and Dr. Anson Au Yeung

Co-supervisor(s)

Department / Unit Decision Sciences and Managerial Economics / Finance

Project duration: From May 2017 to April 2018

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1. Project objectives

The objectives of this project are to:

1) understand postgraduate and undergraduate business students' readiness in eLearning;
2) evaluate the effectiveness of micro modules in the macroeconomics and finance courses for business students at undergraduate and postgraduate levels;
3) identify the best strategies for adopting flipped classroom approach in business courses; and
4) advance knowledge in eLearning, especially in flipped classroom setting.

The project is on track and has been completed on time. The project created impacts as expected and will be discussed in the following.

2. Process, outcomes or deliverables

The proposed research study is extended from the micro-modules that were developed under three MMCDG/CDG projects. The study aims to evaluate the effectiveness of flipped classroom strategy based on these micro-modules and the impacts to students with different background. The micro modules developed for the Macroeconomics and Finance courses at the MBA level in flex mode will also be evaluated.

We plan to measure the effectiveness of flipped classroom in three dimensions, namely students' readiness, quality of teaching materials/ micro modules, and pedagogical design. It

has been well documented in the pedagogical literature that flipped classroom can enhance both the effectiveness of teaching and learning and students' motivation (e.g. Tune, Sturek & Basile 2013, Enfield 2013, McLaughlin et al. 2014). However, most of such research studies usually rely only on self-reported survey results or focus group meetings, and lack direct measurement of the impacts of such pedagogical strategy. Our study filled this gap by adopting instruments to measure the impacts directly, complemented by self-reported survey results.

The following map outlines the structure of this research by summarizing into five main components: Goals, Conceptual Framework, Research Questions, Methods, and Validity.
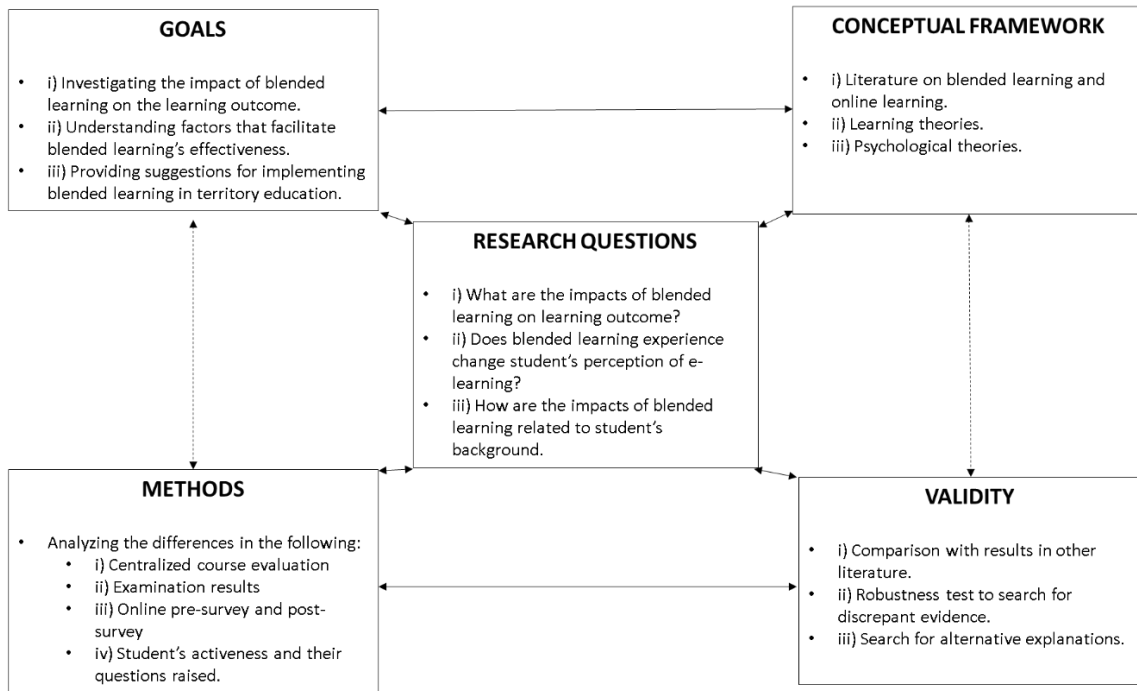
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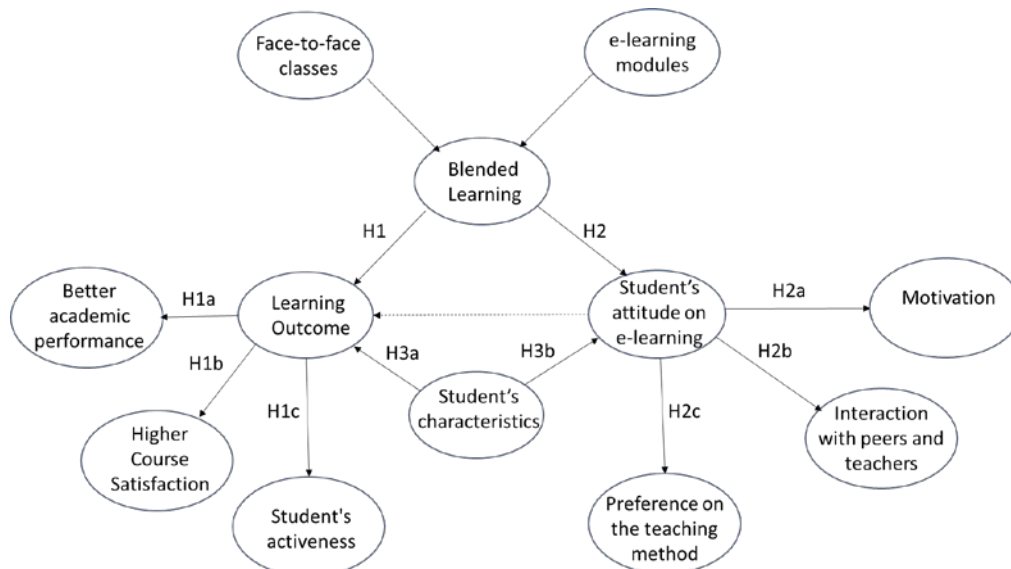
In the study, we investigated the T&L effectiveness of 12 courses (with 7 traditional teaching-mode courses as control).

Course code	Mode	Subject	Year	Number of students
DSME5012E	Traditional	Macroeconomics	2015-16	27
DSME5012W	Traditional	Macroeconomics	2015-16	30
DSME5012X	FLEX	Macroeconomics	2015-16	15
FINA5010X	FLEX	Financial Management	2015-16	15
FINA5010XA	FLEX	Financial Management	2016-17	9
DSME5012XA	FLEX	Macroeconomics	2016-17	9
DSME5012E	Traditional	Macroeconomics	2016-17	29
DSME5012W	Traditional	Macroeconomics	2016-17	44
FINA5010F	Traditional	Financial Management	2017-18	69
DSME1040G/H	Traditional	Macroeconomics	2017-18	134
FINA2010G	Traditional	Financial Management	2017-18	65
FINA5010XA	FLEX	Financial Management	2017-18	44

To compare the effectiveness of T&L on traditional and blended learning in MBA Program, pre- and post- surveys are conducted. The following Design Matrix shows the relationship of each research question with specific goals, methods, and validity issues.

What do I need to know? (Research Questions)	Why do I need to know this? (Goals)	What kind of data will answer the questions? (Method)	Analysis Methods	Potential Conclusions	Validity Threats	Methods to handle the validity threats
H1) What are the impacts of blended learning on learning outcome?	To understand the effectiveness of blended learning. To draw policy implications on the teaching method in territory education.	Centralized course evaluation. Examination results.	Univariate comparison (Lape et al., 2014, Chen and Jones et al, 2007)	Inconclusive	Influence from other factors, such as teaching style, subject, or examination difficulty.	Comparison is made on the same instructor and same course. Control for the same difficulty of examinations in both control group and treatment group.
H2) Does blended learning experience change student's perception of e-learning?	To understand the connection between learning experience and e-learning perception.	Pre-survey and post-survey.	Two-sample univariate comparison (Lape et al., 2014, Chen and Jone et al., 2007)	Favorable attitude towards the use of e-learning elements in the course.	Students desire to please the researchers.	4-digits self-selected secret code is used to hide the identity of student.
H3) How are the impacts of blended learning related to student's background?	To understand factors that facilitate blended learning's effectiveness.	Centralized course evaluation. Examination results. Pre-survey and post-survey.	Regression analysis (López-Pérez et al., 2011)	H2 Effect is more significant for girls and students with less usage of electronic device.	Not enough sample size to draw quantitative conclusion at statistically significant level.	Qualitative assessment will also be used to complement the quantitative result.

3. Evaluation Plan

At the beginning of the study, a comprehensive literature is conducted to have a better understand on the blending learning in business education. The advancement in technologies has had great impacts on teaching and learning in last few decades. Among various applications of technology in education, the blended learning approach has been one of the

most popular pedagogies adopted at different levels of education in the globe (e.g., Picciano, Seaman, Shea, & Swan, 2012; Staker et al., 2011; Parsad & Lewis, 2008; Eklund, Kay, & Lynch, 2003; Sharpe, Benfield, Roberts, & Francis, 2006; Bernard, Borokhovski, Schmid, Tamim, & Abrami, 2014; Norberg et al., 2011). The term "blended" suggested a combination of learning activities happened in both face-to-face and online settings (Osorio Gómez & Duart, 2012; Rooney, 2003; Sands, 2002; Ward & LaBranche, 2003; Young, 2002). Watson (2008) suggested that "blended learning was deemed likely to emerge as the predominant model of the future – and to become far more common that either online or face-to-face instruction alone". Given its popularity and potential enormous impacts in the process of teaching and learning, the blended learning received great attention from academics and educational professionals.

Comparing with those examined blended learning in in K12 and corporate training, there are much more studies done in higher education (Drysdale et al, 2013; Halverson et al. 2012). Allen et al. (2007) reported that 45.9% of U.S. undergraduate institutions already offered blended course by 2004. In the analysis of 205 doctoral dissertations and masters' theses in the domain of blended learning, the majority of the manuscripts (83%) focused on course-level, while the research on program and institution level are limited. Considering the academic subjects in adopting blended learning, Popovich & Neel (2005) suggested that there is increasing importance for business schools delivered education via the Internet. Following this trend, there was dramatically increased in studies in online and blended business education during the past decade (Arbaugh et al., 2009). They also found that the rate of increase is uneven across business disciplines; most publications and studies were from the fields of Information System, Management, and Marketing, while there were fewer contributions from fields such as Supply Chain Management, Finance, and Economics.

In blended learning research in higher education, more studies focused on undergraduate studies, while postgraduate studies were given less attention. Yet postgraduate studies, especially Master of Business Administration (MBA), are predominantly important in business school around the world. Each year, universities in US enrolled more than a quarter of a million students in MBA programs and awarded more than 100,000 MBA degrees annually, at least 66% of all graduate business degrees conferred in the US in 2008 (Murray, 2011). For some top business schools in US, including Harvard Business School and Chicago Booth School of Business, only offer postgraduate programs but not those for undergraduates. There are several studies focused on evaluating benefits of e-components in MBA courses (Salmon, 2000; Murphy and Tyler, 2005; Wresch, et al., 2005; Driver, 2000, 2002). Some studies investigated the performance of full-online/ distance-learning MBA courses, and compared with their traditional face-to-face counterparts (e.g. Anstine and Skidmore, 2005; Arbaugh, 2004; Arbaugh and Rau, 2007; Berry, 2002; Drago and Peltier,2004; Dunbar, 2004; Grandzol, 2004; Hollenbeck, Zinkhan and French, 2005; McGorry, 2003; Smith, 2001; Anstine and Skidmore, 2005) Despite the importance of MBA in business education and the popularity of blended learning in MBA, the study on the effectiveness of blended learning on MBA students are still limited. For example, Clouse and Evans (2003) found that, in an MBA-level information systems course, the combination of asynchronous content delivery and synchronous chat session produced the poorest performance on discrete exam questions, but that the combination of face-to-face content delivery and asynchronous discussion produced significant improvement on open-ended exam questions. In an MBA-level managerial accounting course, Chen and Jones (2007) found that students in the blended courses reported higher levels of learning, but that students in the classroom courses thought that course instruction had more clarity. Further, Jones and Chen (2008) found that students in blended-mode had more positive group work experiences and had more positive

perceptions of the instructor's feedback and responsiveness to questions outside of class.

Given the popularity of blended learning on higher education campuses across the globe (Bernard, Borokhovski, Schmid, Tamim, & Abrami, 2014; Norberg et al., 2011; Henrie at al., 2015), there is a vast literature on studying the advantages and disadvantages of blended learning in the teaching and learning process, and the effectiveness of blended learning.

In the literature, three major advantages of blended learning were identified: 1) Flexibility; 2) Motivation, Engagement and Students Satisfaction; and 3) Student Performance. Blended learning may provide more flexibility to students, teachers and institutions (Moskal et al., 2013; Wallace & Young, 2010). A number of studies (e.g., Bold, 2005; Dziuban et al. 2004; Caruso and Kravik 2005; Rivera and Rice 2002; Dziuban, et al., 2007 Graham, 2004; Macedo-Rouet, Ney, Charles, & Lallich-Boidin, 2009) suggested that "flexibility" is one of the primary reasons for students preferring online learning. In blended learning, students can have greater flexibility of time and location for online learning occur (King & Arnold, 2012; Sharpe, Benfield, & Francis, 2006). The survey results in Olson (2003) found that the most common reasons for students preferring blended learning included their "ability to complete coursework at their own convenience, the increased time for other activities, not having to physically meet all the time. Teachers can also have more flexibility how the course is structured and what pedagogies to be used. In addition, there will be more choices for different learning activities and learning resources. Finally, blended learning provides flexibility to institutions in attracting students from different locations, periods of course offering, physical facility arrangement etc (Wallace and Young (2010).

It is also argued that blending learning may increase students' motivation (Garrison & Kanuka, 2004; Graham & Robison, 2007; Spring, Graham, & Hadlock, 2016) and engagement (Owston, York, & Murtha, 2013). Graham and Robison (2007) suggested that the blended learning may create a more active learning environment. In the blended learning, students are required to use different modes of learning which increase their self-motivation and engagement in the whole learning process ((Meyer, 2014; Norberg, Dziuban, & Moskal, 2011). The impact of blended learning on students' motivation was also demonstrated by higher retention for a course. Dziuban and Moskal (2001) and Vaughan (2007) found that the retention rate of blended courses were higher than their fully face-to-face counterparts. Stockwell, et al. (2015) suggested that blended learning increased attendance and satisfaction.

Another potential advantage of blending learning is that it may improve student performance (Riffell & Sibley, 2005; Alonso, Manrique, Martinez, & Vines, 2011; Al-Qahtani &Higgins, 2013Boyle, Bradley, Chalk, Jones, & Pickard, 2003; Lim & Morris, 2009; O'Toole & Absalom, 2003). Asarta and Schmidt (2017) provided a comprehensive review on studies comparing student performance in blended learning. Course grade and exam scores are commonly used to evaluate student performance in the studies. Overall, several studies found students received higher grades in blended classes than they did in fully face-to-face or online classes (Dziuban & Moskal, 2001; Martyn, 2003; Twigg, 2003; Vaughan, 2007). In the study on 1431 students, Lopez-Perez, M.V., Perez-Lopez, M.C. & Rodriguez-Ariza, L. (2011) found that the use of blended learning has a positive effect in improving exam marks. It is also found that blended learning can enable knowledge construction and problem solving abilities (Bridges, Green, Botelho, & Tsang, 2015). Yet there are also studies reporting negative impact of blended learning on student performance (Xu and Jaggars, 2011).

Given the importance of MBA Programs in major tertiary business education and the rise of blended learning in the Programs, our study may have significant contribution to the literature

and provide insights to the development of the Programs. Arbaugh et al. (2009) examined the state of research of online and blended learning in the business disciplines, and identified some studies evaluating the effectiveness of blended learning in MBA Programs. Generally, the results on the effectiveness are unambiguous. Chen and Jones (2007) found that MBA-level managerial accounting course, students in the blended learning mode reported higher levels of learning. In a study of two sections of a classroom-based undergraduate principles of finance class, Wilson (2003) found that student usage of a supplemental course management system was positively associated with course performance. However, Anstine and Skidmore (2005) found that online students in MBA-level statistics courses performed below students in classroom-based offerings, while Grandzol (2004) found no differences in student performance in his online and classroom-based MBA statistics courses. Although there may be impacts of regional and cultural on blended learning (Wresch, Arbaugh and Rebstock, 2005), there is no study exploring Asian students on the issue.

Empirical investigation of the effectiveness of blended learning will be started by examining the difference in examination performance between traditional teaching and blended learning. The related empirical results are provided in Table 1. To control for the difficulty across examination papers, examination result is compared across students in the same subject conducted by the same instructor. Unlike Pereira et al. (2007) and Pierce and Fox (2012), this study finds that students in blended learning score significantly lower than traditional teaching, regardless of the subject they studied. In a scale of 0-100, the examination performance of BL students in economics and finance are 8.0 marks lower and 9.1 marks lower respectively. On the contrary, Pereira et al. (2007) find that BL students score 1.5 higher than TT students in scale of 0-10 points, while Pierce and Fox (2012) report that BL students attain 3.9 marks higher than TT students in previous year.

The difference in result between this study and their papers may provide insight to explain why empirical evidence is mixed in evaluating the effectiveness of blended learning. The rationale is as following: The effectiveness of flipped classroom element in blended learning relies heavily on whether BL students are willing to watch the video online. Previous literature (i.e., Chen and Lin, 2008; Credé et al., 2010) has shown a strong correlation between class participation and examination performance. Although this relationship can be argued by endogeneity argument (i.e., ambitious students are more willing attend classes and working har on examination), it is generally believed that attending (or watching) lectures has positive effect on the examination performance. As MBA students is likely to have a busy schedule (i.e., family reason or job concern), their opportunity cost of watching online lecture is higher than that of undergraduate students, so some MBA students in blended learning mode may spend lesser time on lecture than those in traditional mode. Thus, lower performance in blended learning is found in MBA students but not in undergraduate students.

Table 1. Examination performance between traditional instruction and blended learning

	Mean#	SD	Min	Median	Max	Skew	N
Economics							
- Blended	73.0	13.7	48.5	76.5	92.5	-0.3	24
- Traditional	81.0	9.2	50.5	82.5	96.5	-0.9	130
- Difference	-8.0*** (-2.74)						
Finance							
- Blended	59.7	16.7	19.0	59.0	93.0	-0.1	68
- Traditional	68.8	15.1	9.0	70.0	97.0	-1.1	69
- Difference	-9.1*** (-3.36)						

\# Examination performance is measured in a scale of 100.

*** Significance at 0.01 level.

The large dispersion of examination result in blended learning for both courses can further support this conjecture. The standard deviation of economics BL classes and finance BL classes are 4.7 higher and 1.6 higher respectively. Given that there is attendance requirement in traditional teaching classes, the higher dispersion of examination results in blended learning can be explained by the variation of time spent on video lectures. In sum, results suggest that the effectiveness of blended learning may be higher for undergraduate students than master students, further investigation can be conducted to examine this conjecture.

Several studies (i.e., Padilla-MeléNdez et al., 2013; Price, 2006) report that there is gender difference in the effect of blended learning. Thus, gender difference in effectiveness of blended learning will also be examined in this paper, and the result is provided in table 2. For economic classes, relative to male students, female students perform better in traditional teaching (-1.4) than in blended learning (-5.4). However, for finance classes, relative to male students, female students perform worser in traditional teaching (-6.2) than in blended learning (-4.7). The implication of this result is mixed. Although overall result suggests that there is no gender difference in the effectiveness of blended learning, the large difference in economics classes suggests that subject effect is in play in explaining gender differences.

Table 2. Comparison between traditional instruction and blended learning by courses

	Mean#	SD	Min	Median	Max	Skew	N
Economics – Traditional							
- Male	81.7	8.3	55.0	82.5	95.0	-0.7	69
- Female	80.3	10.1	50.5	82.5	96.5	-1.0	61
- Difference	1.4 (0.89)						
Economics - Blended							
- Male	75.3	13.8	49.0	78.0	92.5	-0.6	14
- Female	69.9	13.7	48.5	67.8	87.5	0.0	10
- Difference	5.4 (0.95)						
Finance – Traditional							
- Male	70.9	16.4	9.0	73.0	97.0	-1.6	46
- Female	64.7	11.4	42.5	64	95.0	0.6	23
- Difference	6.2 * (1.84)						
Finance – Blended							
- Male	61.4	17.1	19.0	62.0	93.0	-0.4	43
- Female	56.7	15.9	30.0	56.5	89.0	0.5	25
- Difference	4.7 (1.14)						

\# Examination performance is measured in a scale of 100.

Numbers in parentheses represent the t-statistics

* Significance at 0.1 level.

Other than academic performance, the learning experience of students is also an important dimension to assess the effectiveness of blended learning. Table 3 provides the result of course teaching evaluation for students in all the classes. The results of CTE between BL students and TT students are similar, except in a few dimensions: "The course was interesting", "The course was stimulating", "Subject knowledge is enhanced", "Content difficulty appropriate", "Supported by library resources", and "Supported by library resources".

Table 3. Result of course teaching evaluation

	BL#	TT#	Diff
Presentation is clear	5.52	5.62	-0.10
Examples relevant to learning	5.65	5.71	-0.06
Teacher was enthusiastic	5.73	5.80	-0.07
Class participation encouraged	5.56	5.56	0.00
Communication was effective	5.65	5.65	0.00
The course was interesting	5.28	5.50	-0.22**
The course was stimulating	5.32	5.58	-0.26**
Subject knowledge is enhanced	5.42	5.62	-0.19**
The course was well-organized	5.32	5.43	-0.12
Clear learning outcomes	5.38	5.50	-0.12
Appropriate assessment method	5.27	5.38	-0.11
Appropriate workload amount	4.87	4.83	0.03
Recommended readings useful	4.83	4.99	-0.16
Content difficulty appropriate	4.79	5.07	-0.28**
Supported by library resources	4.75	5.11	-0.37**
Supported by IT resources	4.78	5.14	-0.37**
Satisfaction with course	5.44	5.50	-0.06
Satisfaction with teacher	5.62	5.64	-0.01
N	85	159	

Scale of 1 (strongly disagree) to 6 (strongly agree).

Numbers in parentheses represent the t-statistics

** Significance at 0.05 level.

Thus, these results suggest that classroom teaching can make the learning experience more interesting and simulating. The lower score in "Subject knowledge is enhanced" can explain the lower performance in examination shown in Table 1. It implies that students can learn more from in-person teaching over online video. However, the reason behind this phenomenon is still worth for further investigation. As BL students are less confident on "Subject knowledge is enhanced" than TT students, BL students are less likely to agree that the content difficulty is appropriate. Lastly, the lower score in "Supported by IT resources" implies that BL students have a higher expectation on IT supports than TT students.

Several studies have conducted comparative analysis between blended learning and traditional teaching. Chen and Jones (2007) focus on MBA students and find that BL students are more positive on several dimensions, such as perception on instructor, learning from the course, and interest of the classes. Their result is quite different from the finding in this paper, except that BL students in their study also relatively find that the course is difficult. On the contrary, the result of Lape et al. (2014) is more consistent with this study. BL students are less positive on the questions asked, such as "The time spent in class helped me learn the concepts", "In this course, I often felt excited about learning new concepts", and "I feel well prepared for the next level of study in this field". In sum, it shows that each teaching mode has their own edges, and the key is to seek for the optimal point between these two modes.

Table 4. Result of course teaching evaluation by courses

	Economics			Finance		
	BL	TT	Diff	BL	TT	Diff
Presentation is clear	5.68	5.59	0.09	5.46	5.68	-0.22
Examples relevant to learning	5.77	5.72	0.05	5.60	5.68	-0.08
Teacher was enthusiastic	5.73	5.77	-0.04	5.73	5.87	-0.14
Class participation encouraged	5.45	5.55	-0.09	5.60	5.60	0.01
Communication was effective	5.59	5.62	-0.03	5.67	5.72	-0.06
The course was interesting	5.36	5.42	-0.06	5.25	5.68	-0.43***
The course was stimulating	5.36	5.57	-0.20	5.30	5.62	-0.32**
Subject knowledge is enhanced	5.59	5.59	0.00	5.37	5.68	-0.32**
The course was well-organized	5.45	5.30	0.15	5.27	5.74	-0.47***
Clear learning outcomes	5.50	5.42	0.08	5.33	5.68	-0.35***
Appropriate assessment method	5.27	5.26	0.01	5.27	5.66	-0.39***
Appropriate workload amount	4.95	4.58	0.38	4.84	5.46	-0.62***
Recommended readings useful	5.00	4.75	0.25	4.77	5.52	-0.75***
Content difficulty appropriate	5.15	4.95	0.20	4.68	5.35	-0.67***
Supported by library resources	4.80	4.88	-0.08	4.73	5.56	-0.82***
Supported by IT resources	4.92	4.92	0.00	4.74	5.59	-0.86***
Satisfaction with course	5.55	5.41	0.14	5.40	5.70	-0.31**
Satisfaction with teacher	5.64	5.60	0.04	5.62	5.72	-0.10
N	22	112		63	47	

Scale of 1 (strongly disagree) to 6 (strongly agree).

** Significance at 0.05 level

*** Significance at 0.01 level.

Consistent with our conjecture, Table 4 shows that course specific factors are in effect in affecting the effectiveness of blended learning. For economics classes, there is no significant difference in response between blended learning and traditional teaching, that BL students give higher scores in some questions and lower scores in other questions. However, for finance classes, the difference is significant – score of students are significantly lower in 12 out of 18 questions. This results strongly support the difference in effectiveness of blended learning is highly affected by course specific factors.

The last part of empirical analysis focuses on understanding student's perception on the blended learning elements. Pre-survey and Post-survey are then conducted to collect students attitude at the beginning of the course and at the end of the course respectively. Table 5 provides results from both surveys. On average, respondents spend around 2 hours online per day for non-working purpose and 2 hours on their mobile phone. More than half of them have experience on attending online courses. As they are familiar with the e-learning environment, it is not surprised that the e-learning experience in this study does not make significant change in their attitude towards e-learning elements, that can be shown from the insignificant change in responds between pre-survey and post-survey.

The relatively low scores in Q4 (2.42) and Q5 (2.45), comparing to other questions, show that the main barrier of e-learning is still the lack of interaction between students and peers (and teacher). Combining with the relatively low scores in Q1 (3.12) and Q6 (3.18), the results imply that students prefer classes with more interaction with others and can be motivated with more interaction peers. Thus, it suggests that future direction of improving blended learning is to enhance the interaction between students and others. On the other hand, high score in Q2 (3.60) has shown that blended learning does help students to save the learning time (i.e, less traveling time). Thus, it can further support that each method does have its own advantage.

Q7 – Q12 indicates student's attitude towards the specific online activities in the courses. The scores from each question are quite close to each other. Also, they are all about 3.0, suggesting that students are satisfactory with the e-learning element, and more e-learning elements are suggested to be incorporated into even the traditional classes to increase the teaching effectiveness. In relative comparison, it suggests that instructor helps to improve the e-learning experience (3.81 for Q11 and 3.82 for Q12), while e-learning experience still has room for improvement (3.59 for Q8 and 3.39 for Q10).

In previous analysis, respondents are not the same in pre-survey (103 samples) and post-survey (62 samples). Therefore, it is difficult to control for the endogeneity factors caused by different respondents. To preserve privacy and matching need, respondents are told to write a 4-digit code in each survey for matching purpose. Unfortunately, there are only 24 successful pair-up, and their results are provided in Table 6. After controlling student difference, the difference in responses from Q1-Q6 is still insignificant

Table 5 Result of pre-survey and post-survey

	Pre	Post	Diff
Gender (Female%)	38		
Hours spent online	1.90		
Hours spent on mobile	1.99		
Online course experience (%)	58		
Q1: E-learning can motivate me to learn.	3.18	3.12	-0.06
			(-0.40)
Q2: E-learning can save my time in learning.	3.68	3.60	-0.08
			(-0.41)
Q3: I enjoy learning by using electronic device.	3.54	3.54	0.00
			(-0.03)
Q4: E-learning increases my interaction with peers.	2.41	2.42	0.01
			(0.09)
Q5: E-learning increases my interaction with teachers.	2.45	2.45	0.00
			(-0.02)
Q6: Overall, I prefer class with e-learning elements.	3.21	3.18	-0.03
			(-0.19)
Q7: I completed all online learning activities.		3.76	
Q8: Video help me preparing for face-to-face meeting.		3.59	
Q9: Online activities help learning subject knowledge.		3.62	
Q10: I am satisfied by the e-learning experience.		3.39	
Q11: Good connection between online and face-to-face.		3.81	
Q12: I am satisfied with the instructor's performance.		3.83	
Expected time spent on online learning activities.	13.52		
Actual time spent on online learning activities.		13.59	
Q13: I am interested in the course subject.	4.13	4.07	-0.06
			(-0.44)
Q14: I expect to get an above-average score.	4.15	3.94	-0.21
			(-1.49)
N	103	62	

Q1 – Q14 are scale questions scaling from 1 (strongly disagree) to 5 (strongly agree).
Numbers in parentheses represent the t-statistics

Table 6 Pairwise comparison of result of pre-survey and post-survey

	Pre	Post	Diff
Gender (Female%)	50		
Hours spent online	1.54		
Hours spent on mobile	1.88		
Online course experience (%)	50		
Q1: E-learning can motivate me to learn.	3.05	2.92	-0.13
			(-0.38)
Q2: E-learning can save my time in learning.	3.65	3.38	-0.27
			(-0.72)
Q3: I enjoy learning by using electronic device.	3.46	3.29	-0.17
			(-0.51)
Q4: E-learning increases my interaction with peers.	2.27	2.25	-0.02
			(-0.06)
Q5: E-learning increases my interaction with teachers.	2.61	2.25	-0.36
			(-0.98)
Q6: Overall, I prefer class with e-learning elements.	3.34	2.92	-0.42
			(-1.19)
Q7: I completed all online learning activities.		3.45	
Q8: Video help me preparing for face-to-face meeting.		3.31	
Q9: Online activities help learning subject knowledge.		3.43	
Q10: I am satisfied by the e-learning experience.		3.03	
Q11: Good connection between online and face-to-face.		3.60	
Q12: I am satisfied with the instructor's performance.		3.43	
Expected time spent on online learning activities.	7.67		
Actual time spent on online learning activities.		13.07	
Q13: I am interested in the course subject.	4.20	3.92	-0.29
			(-1.06)
Q14: I expect to get an above-average score.	4.27	3.85	-0.43*
			(-1.68)
N	24	24	

Numbers in parentheses represent the t-statistics

Q1 – Q14 are scale questions scaling from 1 (strongly disagree) to 5 (strongly agree).

To further explore how personal factors, affect e-learning attitude, this study identifies four variables that use for explaining difference in response from different questions. Variables "Male" is a dummy variable which equals to 1 if respondent is male, and 0 if respondent is female. Variables "OnlineExp" is a dummy variable which equals to 1 if respondent has online course experience, and 0 if respondent does not have. "OnlineHrs" and "MobileHrs" represent the hours spent online for non-working purpose and spent on mobile respectively. Results of regression on post-survey response are provided in Table 7.

Table 7 Regression analysis of post-survey responses (n = 24)

$$DV_x = \alpha_x + \beta_{1x}(Male) + \beta_{2x}(OnlineHrs) + \beta_{3x}(MobileHrs) + \beta_{4x}(OnlineExp) + \varepsilon_x$$

Dependent Variable	Regression Coefficients				
	α_x	β_{1x}	β_{2x}	β_{3x}	β_{4x}
Q1: E-learning can motivate me to learn.	1.99	0.65	0.71**	-0.30	0.13
		(1.49)	(2.49)	(-1.32)	(0.27)
Q2: E-learning can save my time in learning.	2.69	0.53	0.50	-0.38	0.70
		(0.96)	(1.39)	(-1.30)	(1.17)
Q3: I enjoy learning by using electronic device.	2.48	0.73	0.35	-0.21	0.62
		(1.55)	(1.13)	(-0.86)	(1.23)
Q4: E-learning increases my interaction with peers.	1.80	0.59	0.44	-0.46*	0.71
		(1.24)	(1.40)	(-1.88)	(1.38)
Q5: E-learning increases my interaction with teachers.	1.22	0.93**	0.76**	-0.53**	0.77
		(2.17)	(2.71)	(2.38)	(1.66)
Q6: Overall, I prefer class with e-learning elements.	2.35	0.91*	0.52	-0.52**	0.59
		(1.95)	(1.68)	(-2.14)	(1.16)
Q7: I completed all online learning activities.	3.34	0.56	0.59*	-0.56**	-0.05
		(1.20)	(1.91)	(-2.29)	(-0.09)
Q8: Video help me preparing for face-to-face meeting.	2.29	0.78*	0.50*	-0.20	0.45
		(1.83)	(1.79)	(-0.89)	(0.97)
Q9: Online activities help learning subject knowledge.	2.80	0.57	0.38	-0.29	0.58
		(1.24)	(1.27)	(-1.20)	(1.16)
Q10: I am satisfied by the e-learning experience.	2.37	0.63	0.30	-0.17	0.42
		(1.25)	(0.90)	(-0.65)	(0.76)
Q11: Good connection between online and face-to-face.	2.60	1.11**	0.34	-0.17	0.50
		(2.52)	(1.16)	(-0.75)	(1.05)
Q12: I am satisfied with the instructor's performance.	2.43	1.02**	0.19	-0.09	0.73
		(2.16)	(0.61)	(-0.36)	(1.42)
Q13: I am interested in the course subject.	4.17	-0.15	0.32	-0.50**	0.39
		(-0.37)	(1.16)	(-2.28)	(0.86)
Q14: I expect to get an above-average score.	3.22	0.13	0.57*	-0.35	0.84
		(0.26)	(1.79)	(-1.39)	(1.60)

Numbers in parentheses represent the t-statistics

* Significance at 0.1 level.

** Significance at 0.05 level.

In general, male respondent give higher score in all sort of questions (except Q13), with significant difference in Q5, Q6, Q8, Q11, and Q12. These results provide strong evidence that male students are more welcome for blended learning. This result can be explained by phycological explanation, that male is usually self-learner while female usually learning with others. The implication of these results is that there is a gender difference in learning

perception, and tailor-made e-learning elements may be needed for different gender. Same with the male effect, respondents with longer time spent on online are positive in all sort of questions, with significant difference in Q1, Q5, Q7, Q8, and Q14. It is understandable as they are more familiar with using internet to collect information, so they are more likely to feel comfortable to learn with e-learning experience.

However, results of mobile usage are quite surprising that students with longer time spent on mobile are relatively negative on all sort of questions, with Q4, Q5, Q6, Q7, and Q13. One possible reason is that people with longer time spent on mobile are usually those who prefer to interact more with people. As e-learning in this stage is relatively individual, they may feel relatively less preferred. Lastly, previous experience does not contribute to the difference in response, which suggests that personal factors (or concerns) are more influential than experience effect.

In the last part of empirical analysis, this paper compares responds of post-survey between undergraduate and postgraduate. The objective of this comparison is to examine whether age and working experience effects play a role in determining the effectiveness of e-learning. Result of comparison is provided in Table 8.

Results from the regression analysis provides a strong evidence that undergraduates are more positive on e-learning elements than postgraduates. Undergraduates give higher score in most scale questions, except for Q7, Q11, Q13, and Q14, which are not related to attitude towards e-learning. Moreover, most differences are statistically significant. This result can explain why the evidence in this paper is different from many previous studies, as those studies focus more on undergraduates, so more positive results are found. However, why this difference exists is still an open question, and further investigation may be needed to explore it. In sum, we can see that students, both undergraduates and postgraduates, are generally positive to the e-learning elements.

To further evaluate the response of undergraduate, we provide a correlation matrix to understand the relationship between each dimensions and are provided in table 9. For the correlations of Q6 and other variables, we can find that whether a student prefer e-learning elements depending on four dimensions: whether e-learning motivates student engagement (Q1: 0.68), time saved (Q2: 0.69), existing attitude towards electronic device (Q3: 0.69), and the interaction between peers/teachers (Q4: 0.62). Thus, university can strengthen along these four dimensions to increase the effectiveness of FLEX mode.

Table 8 Result of post-survey between undergraduate and postgraduate

	UG	PG	Diff
Q1: E-learning can motivate me to learn.	3.62	3.12	0.50***
			(3.36)
Q2: E-learning can save my time in learning.	3.78	3.60	0.18
			(1.07)
Q3: I enjoy learning by using electronic device.	3.67	3.54	0.13
			(0.80)
Q4: E-learning increases my interaction with peers.	3.27	2.42	0.83***
			(5.40)
Q5: E-learning increases my interaction with teachers.	3.19	2.45	0.74***
			(4.64)
Q6: Overall, I prefer class with e-learning elements.	3.62	3.18	0.44***
			(2.67)
Q7: I completed all online learning activities.	3.19	3.76	-0.57***
			(-3.59)
Q8: Video help me preparing for face-to-face meeting.	3.76	3.59	0.17
			(1.13)
Q9: Online activities help learning subject knowledge.	3.79	3.62	0.17
			(1.16)
Q10: I am satisfied by the e-learning experience.	3.78	3.39	0.38**
			(2.48)
Q11: Good connection between online and face-to-face.	3.77	3.81	-0.05
			(-0.32)
Q12: I am satisfied with the instructor's performance.	4.04	3.83	0.22
			(1.49)
Q13: I am interested in the course subject.	3.77	4.07	-0.32
			(-2.41)
Q14: I expect to get an above-average score.	3.76	3.94	-0.17
			(-1.21)
N	156	62	

Q1 – Q14 are scale questions scaling from 1 (strongly disagree) to 5 (strongly agree).

Numbers in parentheses represent the t-statistics

* Significance at 0.1 level.

** Significance at 0.05 level.

*** Significance at 0.01 level.

On the other hand, the correlations of Q10 and other variables suggest that whether an e-learning element can provide a satisfactory learning experience to students depending mainly on whether it is helpful for learning (Q8: 0.68, Q9: 0.72, and Q10:0.67). Nowadays, many online materials focuses on the outlook, while this result suggests that the content

should be the most important elements in designing the e-learning element. In other words, the results suggest that online materials should be closely related to the in-class discussion, so that it can provide motivation for students to participate in the online activities.

Table 9 Correlation Matrix of responses from scale questions

Panel A	Q1	Q2	Q3	Q4	Q5	Q6	Q7
Q1	1.00	0.72	0.70	0.59	0.63	0.68	0.34
Q2	0.72	1.00	0.72	0.44	0.42	0.69	0.24
Q3	0.70	0.72	1.00	0.57	0.49	0.69	0.22
Q4	0.59	0.44	0.57	1.00	0.81	0.62	0.35
Q5	0.63	0.42	0.49	0.81	1.00	0.62	0.30
Q6	0.68	0.69	0.69	0.62	0.62	1.00	0.23
Q7	0.34	0.24	0.22	0.35	0.30	0.23	1.00
Q8	0.45	0.38	0.39	0.37	0.31	0.40	0.60
Q9	0.52	0.49	0.44	0.36	0.26	0.43	0.57
Q10	0.46	0.45	0.35	0.23	0.29	0.46	0.46
Q11	0.26	0.25	0.15	0.14	0.16	0.18	0.37
Q12	0.26	0.37	0.17	0.04	0.05	0.13	0.26
Q13	0.16	0.19	0.12	0.17	0.11	0.11	0.35
Q14	0.22	0.28	0.20	0.23	0.14	0.19	0.21
Panel B	Q8	Q9	Q10	Q11	Q12	Q13	Q14
Q8	1.00	0.81	0.68	0.54	0.44	0.39	0.40
Q9	0.81	1.00	0.72	0.58	0.49	0.42	0.46
Q10	0.68	0.72	1.00	0.67	0.58	0.39	0.37
Q11	0.54	0.58	0.67	1.00	0.65	0.54	0.46
Q12	0.44	0.49	0.58	0.65	1.00	0.50	0.53
Q13	0.39	0.42	0.39	0.54	0.50	1.00	0.66
Q14	0.40	0.46	0.37	0.46	0.53	0.66	1.00

Lastly, when we study the correlations of Q12 and other variables, we find that the satisfactory of e-learning elements, even though they are online elements are affecting student's attitude towards the instructor. This observation can be implied from the moderate correlation from Q8 to Q11 (Q8: 44, Q9: 49, Q10: 58, and Q11: 65). Also, e-learning elements affect the student interest as well, as the correlations of Q12 and Q8 to Q11 (Q8: 39, Q9: 42, Q10: 39, and Q11: 54) are also moderate. Thus, e-learning elements are affecting different aspects in the course. As a result, more teaching sessions can be conducted to make instructors to understand how to incorporate e-learning elements into their classes.

Results from Focus Group

In the study period, 11 focus groups and students meetings were organized to collect feedbacks from students in Flex MBA.

The major reasons for students choosing Flex courses are:

- enjoy a high flexibility in learning as compared to fixed class hours under non-flex mode
- need to travel for trips occasionally during the term and hence cannot attend regular classes every week;
- traditional mode class clashes with working schedule;
- some electives courses are offered in Flex option only;
- Student learning experience:

We also received the feedbacks in the following areas:

1. Course Content

- Some of the video length is too long and student prefer the duration of the video should be limited to 15 minutes each.
- Teacher delivered too much information in one topic. When students see that a module have 80 minutes, it discouraged them to watch that module instantly.
- Student refer to the brief description of each video is very important. It would be good to add subtitle to the videos.
- Some of the videos are too boring. Students suggested that video could be more interesting which will increase students' motivation to watch the videos. It would help to encourage students to learn if the video content is related to daily work life. Students find some entertaining sample videos on Facebook (i.e. business insider) will be so much fun.
- The format of video could have various ways. For instance, dialog, outdoor site visit, etc.
- The time limit of the quiz results in great pressure and less effectively to learn on the case. Suggest to remove the time limit

2. LMS and video streaming system

- The speed function of the video player is very useful. Student could adjust the video speed (faster/slower) easily according to their needs.
- The function of video streaming system and LMS could be more advance and user-friendly. For instance, Bookmark, Speeding, Quiz result, etc.
- The university should allow students to download the videos. Student would like to have the flexibility to choose the time they watch the videos even if they have no internet access. Majority of the MBA students (especially for students who choose Flex mode) are very busy and required to travel for trips occasionally. If student could watch videos while they are on airplane, it would help them to save a lot of time.

3. Class size

- Flex students who have experience a small class (i.e. 2 students per class) and a big class (i.e. 44 students per class) commented that the class size has affected the course quality. It happened that the interaction between student and teachers in a big class is much less than that of the small class. It is also difficult for teacher to deliver two-way teaching for a big class.
- The number of students per class should limit to less than 40.

4. Teaching styles

- Some students feels that they are treated as undergraduate students as they are required collect stickers from teachers in order to get a pass class pacification marks.

- If students are taking two courses per term, it is scheduled that both teacher and students should take two 3-hours lecture per day. Some teachers choose to deliver one-way teaching so that they can deliver more knowledge to the students (due to the limited number of face-to-face sessions). However, some students feel that it is very boring as a whole day lecture.

- Teacher's presentation in person does not consist with the video's presentation. It sounds a bit stiff.

- Teacher deliver the lecture in a very fast speed ad student could not have enough time to digest the content and get the knowledge

5. Course schedule

- More Flex elective courses to be chosen

- It'd be great if teacher could arrange an office hour/online Q&A session to answer student's questions.

- Before the face-to-face class, students could have more time to discuss the topics with teacher.

4. Dissemination, diffusion and impact

The study results were presented at the Teaching and Learning Innovation Export 2017 in December 2017. In addition, the research work was also presented at the International Conference on Education and Learning 2017 in Tokyo, Japan, and the presentation was well received by the participants.

The research paper entitled "A Blended Learning Lecture Delivery Model for economics and finance courses in MBA Programs" is work-in progress and aims to submit to top-tier educational journal in August 2018 for publication.

The results were also shared with teachers who in charge of blended-learning courses at both undergraduate and postgraduate level in Business School. Some changes have been made in the curriculum and course delivery has been made in response to the study results in this project.

The project results will be also included in the Flex MBA Program Evaluation Report to the University's eLearning Taskforce in June 2018. It may further support the University's strategic aims in promoting eLearning.

PART II
Financial data

Funds available:

Funds awarded from MMCDG	$	137,500
Funds secured from other sources	$	
(please specify_____)		

Total: $ 137,500

Expenditure:

Item	Budget as per application	Expenditure	Balance
Part-time RA	$96,000	$94,721.2	$1,278.8
Student helper	$9,350	$9,350	$0
Editing	$5,050	$4,914	$136
Conference	$24,000	$7,978.91	$16,021.09
Software License	$3,100	$0	$3,100
Total:	$137,500	$116,964.1	$20,535.89

PART III

Lessons learnt from the project

The study framework has been well-developed to evaluate the effectiveness of T&L on blended learning courses in Business School. We may use the framework for other courses in the School.

PART IV
Information for public access

Summary information and brief write-ups of individual projects will be uploaded to a publicly accessible CUHK MMCDG website. Please extract from Part I the relevant information to facilitate the compilation of the publicly accessible website and reports.

1. Keywords

Please provide five keywords (in the order of most relevant to your project to least relevant) to describe your micro-modules/pedagogies adopted.

(Most relevant)   Keyword 1: blended learning

                      Keyword 2: T&L Effectiveness

                      Keyword 3: finance

                      Keyword 4: economics

(Least relevant)   Keyword 5: flipped classroom

2. Summary

Please provide information, if any, in the following tables, <u>and provide the details in Part I</u>.

Table 1: Publicly accessible online resources (if any)
(a) **Project website:** *Nil*
(b) **Webpage(s):** *Nil*
(c) **Tools / Services:** *N/A*
(d) **Pedagogical Uses:** *N/A*

Table 2: Resource accessible to a target group of students (if any)
If resources (e.g. software) have been developed for a target group of students (e.g. in a course, in a department) to gain access through specific platforms (e.g. Blackboard, facebook), please specify.

Course Code/ Target Students	Term & Year of offering	Approximate No. of students	Platform
DSME5012E	3rd term 2015-16	27	Blackboard
DSME5012W	3rd term 2015-16	30	Blackboard
DSME5012X	3rd term 2015-16	15	Blackboard
FINA5010X	3rd term 2015-16	15	Blackboard
FINA5010XA	2nd term 2016-17	9	Blackboard
DSME5012XA	3rd term 2016-17	9	Blackboard
DSME5012E	3rd term 2016-17	29	Blackboard

DSME5012W	3rd term 2016-17	44	Blackboard
FINA5010F	1st term 2017-18	69	Blackboard
DSME1040G/H	2nd term 2017-18	134	Blackboard
FINA2010G	2nd term 2017-18	65	Blackboard
FINA5010XA	2nd term 2017-18	44	Blackboard

Table 3: Presentation (if any)	
Please classify each of the (oral/poster) presentations into one and only one of the following categories	**Number**
(a) In workshop/retreat within your unit (e.g. department, faculty)	
(b) In workshop/retreat organized for CUHK teachers (e.g. CLEAR workshop, workshop organized by other CUHK units)	
(c) In CUHK ExPo jointly organized by CLEAR and ITSC	*1 Poster presentation*
(d) In any other event held in HK (e.g. UGC symposium, talks delivered to units of other institutions)	
(e) In international conference	*1 Paper presentation*
(f) Others (please specify)	

Table 4: Publication (if any)	
Please classify each piece of publications into one and only one of the following categories	**Number**
(a) Project CD/DVD	
(b) Project leaflet	
(c) Project booklet	
(d) A section/chapter in a booklet/ book distributed to a limited group of audience	
(e) Conference proceeding	
(f) A chapter in a book accessible internationally	
(g) A paper in an referred journal	

(h) Others (please specify)	

3. A one-page brief write up

Please provide a one-page brief write-up of no more than 500 words and a short video.

Over the last decade, blended learning has gained popularity all over the world. With advanced technology, students are now more convenient to learn outside classroom, and can fine-tune their studying pace based on individual progress. In Chinese University of Hong Kong, many undergraduate courses are now incorporated blended learning elements into the course design. A more remarkable move has been made by the MBA office since 2015. MBA part-time students can now choose to study in FLEX mode to study outside the classroom and enjoy the greater time flexibility.

Despite existing literature generally provides supporting evidence for the benefit of blended learning, people also argue that blended learning has its drawbacks that cannot be ignored. Moreover, whether the effectiveness of blended learning is the same across students is still an open question.

The above concerns have motivated us to conduct this study. The objective of this study is to evaluate the effectiveness of blended pedagogy in teaching and learning. The results also provide insights and suggestions for the institution to improve the blended learning pedagogies for both undergraduate and postgraduate programs. Also, the study will later be used for paper submission to shed light on related literature.

The study utilizes a database, which includes 10 MBA classes (291 students) and 3 undergraduate classes (199 students) from 2015 to 2018. The subject of those classes is either Financial Management or Macroeconomics. To control for the effect from instructor, class of the same subject in this sample is conducted by the same instructor. Three measures are used to assess the learning outcome: course teaching evaluation, examination result, and surveys.

The findings can be roughly summarized as follows:

First, both undergraduates and postgraduates are positive on the blended learning elements. When it comes to comparison, undergraduates are more positive on the e-learning elements. In sum, blended learning students concern on the lack of connection with peers/teachers, while enjoy the greater flexibility in study. Also, there is no significant change in e-learning attitude after students experienced blended learning.

Second, student response in course teaching evaluation is similar between blended learning classes and traditional teaching classes, except several dimensions. For example, student in blended learning give a relatively lower score on the interest of course and the level of knowledge enhanced.

Third, examination score is slightly lower for students in blended learning, and this difference is not affected by gender.

In general, the performance of students in blended learning perform close to that in traditional teaching, except in a few dimensions. It is understandable as traditional teaching has been

established for a long time, while blended learning has just been emerged since last decade. Thus, by analyzing results in this paper and consolidating comments in other literature, this study provides several suggestions in institutional perspective and instructor perspective to provide a better learning experience to students. In sum, we believe that the center of question is not whether blended learning is needed, but how blended learning should be conducted.

4. Reference

Al-Qahtani Awadh, A. Y., & Higgins, S. (2013). Effects of traditional, blended and e-learning on students'achievement in higher education. Journal of Computer Assisted Learning, 29(3), 220-234.

Allen, I. E., Seaman, J., & Garrett, R. (2007). Blending in: The extent and promise of blended education in the United States. Sloan Consortium. PO Box 1238, Newburyport, MA 01950.

Alonso, F., Manrique, D., Martínez, L., & Viñes, J. M. (2011). How blended learning reduces underachievement in higher education: An experience in teaching computer sciences. IEEE Transactions on Education, 54(3), 471-478.

Anstine, J., & Skidmore, M. (2005). A small sample study of traditional and online courses with sample selection adjustment. The Journal of Economic Education, 107-127.

Arbaugh, J. B. (2004). Learning to learn online: A study of perceptual changes between multiple online course experiences. The internet and higher education, 7(3), 169-182.

Arbaugh, J. B., Godfrey, M. R., Johnson, M., Pollack, B. L., Niendorf, B., & Wresch, W. (2009). Research in online and blended learning in the business disciplines: Key findings and possible future directions. The Internet and Higher Education, 12(2), 71-87.

Arbaugh, J. B., & Rau, B. L. (2007). A study of disciplinary, structural, and behavioral effects on course outcomes in online MBA courses. Decision Sciences Journal of Innovative Education, 5(1), 65-95.

Asarta, C. J., & Schmidt, J. R. (2017). Comparing student performance in blended and traditional courses: Does prior academic achievement matter?. The Internet and Higher Education, 32, 29-38.

Bernard, R. M., Borokhovski, E., Schmid, R. F., Tamim, R. M., & Abrami, P. C. (2014). A meta-analysis of blended learning and technology use in higher education: from the general to the applied. Journal of Computing in Higher Education, 26(1), 87-122.

Berry, R. W. (2002). The efficacy of electronic communication in the business school: Marketing students' perceptions of virtual teams. Marketing Education Review, 12(2), 73-78.

Bold, M. (2006). Use of wikis in graduate course work. Journal of Interactive Learning

Research, 17(1), 5.

Boyle, T., Bradley, C., Chalk, P., Jones, R., & Pickard, P. (2003). Using blended learning to improve student success rates in learning to program. Journal of educational Media, 28(2-3), 165-178.

Bridges, S. M., Green, J., Botelho, M. G., & Tsang, P. C. (2015). Blended learning and PBL: An interactional ethnographic approach to understanding knowledge construction in-situ. Essential readings in problem-based learning: Exploring and extending the legacy of Howard S. Barrows, 107-130.

Caruso, J. B & Kvavik, R. B (2005). ECAR Study Of Students And Information Technology

2005: Convenience, Connection, and Control. Boulder, CO: EDUCAUSE Center for Applied

Research.

Chen, C. C., & Jones, K. T. (2007). Blended learning vs. traditional classroom settings: Assessing effectiveness and student perceptions in an MBA accounting course. Journal of educators online, 4(1), n1.

Chen, J., & Lin, T. F. (2008). Class attendance and exam performance: A randomized experiment. The Journal of Economic Education, 39(3), 213-227.

Clouse, S. F., & Evans, G. E. (2003). Graduate business students performance with synchronous and asynchronous interaction e-learning methods. Decision Sciences Journal of Innovative Education, 1(2), 181-202.

Credé, M., Roch, S. G., & Kieszczynka, U. M. (2010). Class attendance in college: A meta-analytic review of the relationship of class attendance with grades and student characteristics. Review of Educational Research, 80(2), 272-295.

Drago, W., & Peltier, J. (2004). The effects of class size on effectiveness of online courses. Management Research News, 27(10), 27-41.

Driver, M. (2000). Integrating internet-based resources into classroom instruction: An organizational learning approach. Journal of Business Education, 1: 14–30.

Driver, M. (2002). Investigating the benefits of web-centric instruction for student learning – An exploratory study of an MBA course. Journal of Education for Business, 77: 236–245.

Drysdale, J. S., Graham, C. R., Spring, K. J., & Halverson, L. R. (2013). An analysis of research trends in dissertations and theses studying blended learning. The Internet and Higher Education, 17, 90-100.

Dunbar, AE 2004, 'Genesis Of An Online Course', Issues in Accounting Education, , vol. 19, no. 3, pp. 321-43

Dziuban, C., Hartmanm, J., & Moskal, P. (2004). Blended learning. Educause Center for Applied Research Bulletin, 2004(7), 1-2

Dziuban, C., & Moskal, P. (2001). Evaluating distributed learning in metropolitan universities. Metropolitan Universities, 12(1), 41.

Dziuban, C., Hartman, J., Juge, F., Moskal, P., & Sorg, S. (2007). Blended learning enters the mainstream. In C. J. Bonk & C. R. Graham (Eds.), The handbook of blended learning: Global

perspectives, local designs (pp. 195–206)

Enfield, J. (2013). Looking at the impact of the flipped classroom model of instruction on undergraduate multimedia students at CSUN. TechTrends, 57(6), 14-27.

Eklund, J., Kay, M., & Lynch, H. M. (2003). E-learning: Emerging issues and key trends: A discussion paper. Australian National Training Authority (ANTA).

Garrison, D. R., & Kanuka, H. (2004). Blended learning: Uncovering its transformative potential in higher education. The internet and higher education, 7(2), 95-105.

Graham, C. R. (2013). Emerging practice and research in blended learning. Handbook of distance education, 3, 333-350.

Graham, C. R., & Robison, R. (2007). Realizing the transformational potential of blended learning: Comparing cases of transforming blends and enhancing blends in higher education. Blended learning: Research perspectives, 83-110.

Grandzol, J. R. (2004). Teaching MBA statistics online: A pedagogically sound process approach. Journal of Education for Business, 79(4), 237-244.

Halverson, L. R., Graham, C. R., Spring, K. J., & Drysdale, J. S. (2012). An analysis of high impact scholarship and publication trends in blended learning. Distance Education, 33(3), 381-413.

Henrie, C. R., Bodily, R., Manwaring, K. C., & Graham, C. R. (2015). Exploring intensive longitudinal measures of student engagement in blended learning. The International Review of Research in Open and Distributed Learning, 16(3).

Hollenbeck, C. R., Zinkhan, G. M., & French, W. (2005). Distance learning trends and benchmarks: Lessons from an online MBA program. Marketing Education Review, 15(2), 39-52.

King, S. E., & Cerrone Arnold, K. A. T. I. E. (2012). Blended learning environments in higher education: A case study of how professors make it happen. Mid-Western Educational Researcher, 25.

Lape, N. K., Levy, R., Yong, D., Haushalter, K., Eddy, R., & Hankel, N. (2014). Probing the Inverted Classroom: A Controlled Study of Teaching and Learn-ing Outcomes in Undergraduate Engineering and Mathematics. age, 24, 1.

Lim, D. H., & Morris, M. L. (2009). Learner and instructional factors influencing learning outcomes within a blended learning environment. Journal of Educational Technology & Society, 12(4), 282.

López-Pérez, M. V., Pérez-López, M. C., & Rodríguez-Ariza, L. (2011). Blended learning in higher education: Students' perceptions and their relation to outcomes. Computers & Education, 56(3), 818-826.

Macedo-Rouet, M., Ney, M., Charles, S., & Lallich-Boidin, G. (2009). Students' performance and satisfaction with Web vs. paper-based practice quizzes and lecture notes. Computers & Education, 53(2), 375-384.

Martyn, M. (2003). The hybrid online model: Good practice. Educause Quarterly, 26(1), 18-23.

McGorry, S. Y. (2003). Measuring quality in online programs. The Internet and Higher Education, 6(2), 159-177.

McLaughlin, J. E., Roth, M. T., Glatt, D. M., Gharkholonarehe, N., Davidson, C. A., Griffin, L. M., ... & 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.

Meyer, K. A. (2014). Student engagement in online learning: What works and why. ASHE Higher Education Report, 40(6), 1-114.

Moskal, P., Dziuban, C., & Hartman, J. (2013). Blended learning: A dangerous idea?. The Internet and Higher

Education, 18, 15-23.

Murphy, S. M., & Tyler, S. (2005). The relationship between learning approaches to part-time study of management courses and transfer of learning to the workplace. Educational Psychology, 25(5), 455-469.

Murray, M. (2011). MBA share in the US graduate management education market.

Norberg, A., Dziuban, C. D., & Moskal, P. D. (2011). A time-based blended learning model. On the Horizon, 19(3), 207-216.

Olson, D.M. (2003). Student perceptions of hybrid classes at a notebook university. The

University of North Dakota. ProQuest Dissertations and Theses, p.86.

Osorio Gómez, L. A., & Duart, J. M. (2012). A hybrid approach to university subject learning activities. British Journal of Educational Technology, 43(2), 259-271.

O'Toole, J. M., & Absalom, D. J. (2003). The impact of blended learning on student outcomes: Is there room on the horse for two?. Journal of Educational Media, 28(2-3), 179-190.

Owston, R., York, D., & Murtha, S. (2013). Student perceptions and achievement in a university blended learning strategic initiative. The Internet and Higher Education, 18, 38-46.

Padilla-MeléNdez, A., Del Aguila-Obra, A. R., & Garrido-Moreno, A. (2013). Perceived playfulness, gender differences and technology acceptance model in a blended learning scenario. Computers & Education, 63, 306-317.

Parsad, B., & Lewis, L. (2008). Distance Education at Postsecondary Institutions: 2006-07. First Look. NCES 2009-044. National Center for Education Statistics.

Pereira, J. A., Pleguezuelos, E., Meri, A., Molina-Ros, A., Molina-Tomas, M. C., & Masdeu, C. (2007). Effectiveness of using blended learning strategies for teaching and learning human anatomy. Medical education, 41(2), 189-195.

Picciano, A. G., Seaman, J., Shea, P., & Swan, K. (2012). Examining the extent and nature of online learning in American K-12 education: The research initiatives of the Alfred P. Sloan Foundation. The Internet and Higher Education, 15(2), 127-135.

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(10), 196.

Price, L. (2006). Gender differences and similarities in online courses: challenging stereotypical views of women. Journal of Computer Assisted Learning, 22(5), 349-359.

Riffell, S., & Sibley, D. (2005). Using web-based instruction to improve large undergraduate biology courses: An evaluation of a hybrid course format. Computers & education, 44(3), 217-235.

Rivera, J. C., & Rice, M. L. (2002). A comparison of student outcomes and satisfaction between traditional and web based course offerings. Online Journal of Distance Learning Administration, 5(3), 151-179.

Rooney I.E. (2003). Blended learning. Association Management, 28-32.

Popovich, C. J., & Neel, R. E. (2005). Characteristics of distance education programs at accredited business schools. The American Journal of Distance Education, 19(4), 229-240.

Salmon, G. (2004). E-moderating: The key to teaching and learning online. Psychology Press.

Sands, P. (2002). Inside outside, upside downside: Strategies for connecting online and

face-to-face instruction in hybrid courses. Teaching with Technology Today, 8(6).

Sharpe, R., Benfield, G., Roberts, G., & Francis, R. (2006). The undergraduate experience of blended e-learning: a review of UK literature and practice. The higher education academy, 1-103.

Smith, L. J. (2001). Content and delivery: A comparison and contrast of electronic and traditional MBA marketing planning courses. Journal of Marketing Education, 23(1), 35-44.

Spring, K. J., Graham, C. R., & Hadlock, C. A. (2016). The current landscape of international blended learning. International Journal of Technology Enhanced Learning, 8(1), 84-102.

Staker, H. (2011). The Rise of K-12 Blended Learning: Profiles of Emerging Models. Innosight Institute.

Stockwell, B. R., Stockwell, M. S., Cennamo, M., & Jiang, E. (2015). Blended learning improves science education. Cell, 162(5), 933-936.

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.

Twigg, C. A. (2003). Models for online learning. Educause review, 38, 28-38.

Vaughan, N. (2007). Perspectives on blended learning in higher education. International Journal on ELearning,

6(1), 81.

Wallace, L., & Young, J. (2010). Implementing blended learning: Policy implications for universities. Online Journal of Distance Learning Administration, 13(4), 7.

Watson, J. (2008). Blended Learning: The Convergence of Online and Face-to-Face Education. Promising Practices in Online Learning. North American Council for Online Learning.

Ward, J., & LaBranche, G. A. (2003). Blended learning: The convergence of e-learning and meetings. Franchising World, 35(4), 22-22.

Wilson, D., & Smilanich, E. M. (2005). The other blended learning: a classroom-centered approach. John Wiley & Sons.

Wresch, W., Arbaugh, J. B., & Rebstock, M. (2005). International online management education courses: A study of participation patterns. The Internet and higher education, 8(2), 131-144.

Xu, D., & Jaggars, S. S. (2011). Online and Hybrid Course Enrollment and Performance in Washington State Community and Technical Colleges. CCRC Working Paper No. 31. Community College Research Center, Columbia University.

Young, M. F. (2002). The Curriculum of the Future: from the'new sociology of education'to a critical theory of learning. Routledge.