



Hybrid learning for the digital natives: Impacts on academic performance and learning approaches

Russell T. Rodrigo^{a,*}, Lawrence H. Platon^b

^a Department of Bachelor of Arts in English for Applied Global Communication, Faculty of Communication Arts, Stamford International University, Bangkok 10250, Thailand

^b Department of Curriculum and Instruction, Faculty of Education, Srinakarinwirot University, Bangkok 10110, Thailand

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Abstract

Multitudes of relevant learning modalities have been heavily researched in higher education, seeking effective curricular delivery to address surface learning and the demands of the industries. One of the trends in 21st-century teaching and learning is hybrid learning. Hence, this study aimed to find out if hybrid learning makes a significant difference in students' academic performance and learning approaches in the delivery of English academic courses at an international university in Bangkok, Thailand. This study employed the factorial research method and two types of a hybrid classroom, which were 50 percent – 50 percent and 70 percent – 30 percent modalities. The effectiveness of the modalities was measured through students' scores in pretest and posttest of Deep Learning Survey Questionnaires and academic performance that demonstrate the three dimensions of deep learning (*high order thinking, integrative, and reflective learning*). The results showed that the 50 percent – 50 percent hybrid learning modality made a significant difference in students' academic performance compared to 70 percent – 30 percent hybrid learning modality. However, based on the self-survey questionnaires, 70 percent – 30 percent showed a significant difference. This means that self-survey scores do not reflect students' actual academic performance. Based on the findings, it can be inferred that 50 percent – 50 percent hybrid learning made a significant difference in academic performance; hence, it is the proposed hybrid-learning model. These results might be useful in the development of a technology-integrated curriculum in higher education to address the required skills of 21st century graduates.

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* Corresponding author.

E-mail address: russell.rodrigo@stamford.edu (R. T. Rodrigo).

Introduction

Multitudes of relevant learning modalities are applied in higher education today. Various researchers have continuously been seeking the most appropriate curricular delivery suitable to students' needs and capabilities. Although many universities still apply face-to-face learning, numerous have already gone to virtual delivery, and the most popular approach used in higher education today, especially in postgraduate programs, is blended learning. Tackling a new learning method and implementing it in university program deliveries requires an evaluation of the effectiveness of its delivery by institutional administrations. Hence, this study aimed to evaluate the effectiveness of the hybrid-learning model in the delivery of the required undergraduate English courses in an international university in Bangkok, Thailand.

The prevalent issue faced by university instructors is students' surface approach to learning. According to Marton, Hounsell, and Entwistle (1984), surface-level learning refers to low-level cognitive activities, which focus on memorizing. It is also often called strategic learning, which can also be useful in some circumstances. Students often select and set priorities of items they think they need to learn. Since concentration is given on memorizing facts, lecturers are led to interpret that comprehension occurs. Various factors lead students to apply a surface learning approach such as overwhelming number of assessments, anxieties to due dates, English proficiency level, and others (Biggs, 2011). Many undergraduate students display passivity in class but are highly active on social networking sites and electronic games. Bickerdike, O'Deasmhunaigh, O'Flynn, and O'Tuathaigh's (2016) indicated that students' school year grade is significantly related to students' time management skills and organization of their study learning styles caused by the excessive use of social networks. With the issues posed by surface learning and conventional teaching method, this paper aimed to examine the use of a hybrid classroom in addressing surface learning through course learning outcome achievements and whether this intervention encourages deep learning, which can be demonstrated through reflective learning, integrative learning, and high-level thinking skills. This paper

specifically aimed to answer the following research questions: (1) Is there a significant difference in the learning approaches of students in terms of deep learning dimensions such as high level thinking, integrative, and reflective learning between control and experimental groups?; (2) Is there a significant difference in academic performance between control and experimental groups and when grouped according to courses?; (3) Is there a significant relationship between the extent of use of hybrid classroom and academic performance of students?; and (4) Based on the findings, what hybrid learning model maybe proposed?

Operational Definitions

Hybrid learning is commonly known as "blended learning", which incorporates both traditional face-to-face and online learning activities. However, hybrid learning employs more synchronous learning compared to blended learning, which only uses asynchronous online tasks. The two hybrid modalities used in this study were 70 percent – 30 percent, 50 percent – 50 percent and 70 percent – 30 percent meaning students are mostly in face-to-face class (80 mins.), supported by online work (40 mins.) (synchronous or asynchronous). On the other hand, 50 percent – 50 percent modality refers to spending half of the 4 hours teaching per week, face to face (2 hours), and the other half (2 hours) is spent learning online (synchronous or asynchronous). Moreover, deep learning refers to a learning approach that applies more high order thinking, integrative, and reflective learning.

Literature Review

There have been number of studies conducted in measuring deep learning and in encouraging students to apply deep learning strategies to learning. In the study about changing the learning environment and its impacts on deep learning, it found that students did significantly incline in the use of deep learning and slightly but significantly decline in the use of surface learning approach (Hall, Ramsay, & Raven, 2004). The change in an environment through group discussions and activities both in class and online brought significant change

in the way students approached learning. Furthermore, it was also found out that course staging, delivery, and assessments influence learners' approach to learning (Entwistle, 2000). Baeten, Kyndt, Struyven, and Dochy (2010) also found that students' learning approaches differ from each other dependent on disciplines or major, teachers' influence and course delivery, the satisfaction of the course materials and requirements, and understanding of the course learning outcomes and expectations. Students' characteristics based on age or maturity and intrinsic motivation are also found to be another factor that influences deep learning.

Moreover, Hasnora, Ahmad, and Nordin (2013), who examined the relationship between academic achievement and deep learning approach, found interesting results. They found that only the surface approach was slightly correlated to academic achievement, which was shown in an inverse relationship. This demonstrated that most of the respondents were surface learners. Moreover, they did not find any correlation between academic achievement and deep approach and academic achievement and strategic approach. The ambiguity of the blended learning model and delivery led Precl, Eshet-Alkalai, and Alberton (2009) to find out aspects, and pedagogical design that need to be considered before implementation. Their findings revealed that students preferred interactive and constructive activities. They also reiterated that printed learning materials should also be made available, and early preparation and completion of the pedagogical design are of high relevance.

Bliuc, Ellis, Goodyear, and Piggot (2011) and Ceylan and Kesici (2017) also examined the relationships between blended learning approach and students' academic performance. Their findings showed that students view their learning experiences differently. These learning perceptions were seen relatively correlated to students' marks. Cohesive perceptions resulted in higher academic gains, while fragmented conceptions resulted in poor academic performance. Lastly, Lee, and Lai (2017) examined the perceptions of students regarding the flipped classroom approach and investigated if it helped boost high-order thinking skills. They found that students perceived flipped classrooms positively due to getting more support during classroom sessions. They also found more opportunities to interact with

other students and the teacher. However, some students still viewed it confusing and preferred to be taught conventionally. The flipped classroom was also seen correlated to higher-order thinking skills as demonstrated in critical analysis during independent learning and course assignment completions.

To address the gaps of the abovementioned, studies should give attention to the factors affecting the implementation of a hybrid-learning course. Among the factors are teacher engagement and motivation, learning context, and assessments appropriate to the level and age of the students. To produce reliable results in finding out the correlation between deep learning and academic achievement, subjective measures should be supported by objective measures such as course assessments. This study employed both self-survey questionnaires and students' academic performance through course assessment scores that demonstrated the three dimensions of deep learning. There should be a control group for point of comparison in examining the effectiveness of a hybrid-learning course. Hence, this current study applied the factorial research method and used the Blackboard Learning Management System that features various types of interactions and activities.

Conceptual Framework

Figure 1 below shows the conceptual framework of this study. The Pre-class in a hybrid classroom focuses on receptive skills. Course materials covered weekly were posted in advance for students to read. Pre-assessments were also given to ensure engagement of the materials posted on the learning management system, Blackboard. The In-class focused on productive skills clarifying students' comprehension. The lecturer provided more student-centered methods in eliciting ideas from the class through group discussions and presentations whenever problems occurred concerning comprehension. The Post-class provided students opportunities to increase and maintain student motivation for engagement outside of class time and assess students' progress. In this research, the post-class included weekly Blackboard discussions or participation and assessments such as essays, homework, and others asynchronously or synchronously.

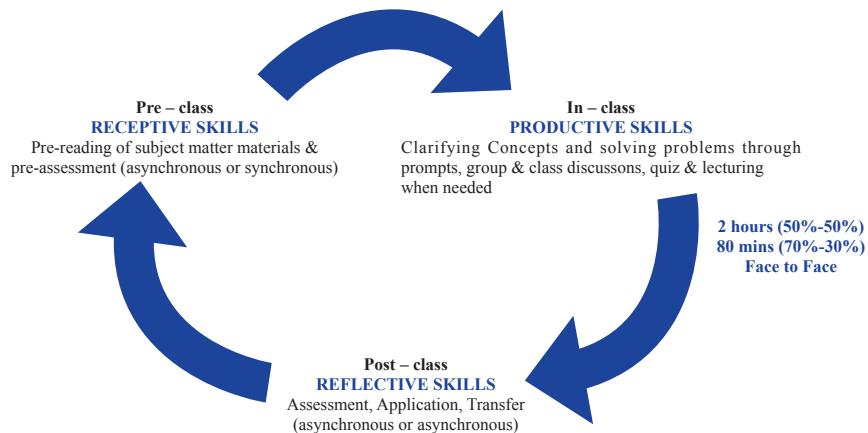


Figure 1 Hybrid Learning Model

Methodology

This research used a factorial research design to determine the effects of the independent variables (conventional approach and hybrid classroom approach; 70 percent – 30 percent and 50 percent – 50 percent) to the course learning outcomes through the given assessments. The results of the assessments given to both groups were presumed to be the result of the independent variables. To find out whether there is a significant difference in the learning approaches of students in terms of deep learning dimensions such as *high order thinking, integrative learning, and reflective learning*, Pre and Post survey questionnaires were given to both groups using the standardized Measuring Deep Approaches to Learning adapted from the National Survey of Student Engagement made by Indiana University. The results in the questionnaires mentioned were presumed to be the results of the experiment using the conventional approach and hybrid learning approach. Additionally, this research method was the most appropriate when examining an impact of an intervention and an outcome when an experiment's design consists of two or more factors and whose experimental units take on all possible combinations of these levels across all such factors (Harris et al., 2006). Moreover, to determine if there is a significant difference in academic performance between the control and experimental groups, course assessment scores were used. For ENG102, Blackboard discussion participation,

presentations, and essay assessments were used. For ENG103, Blackboard discussion participation, presentations, and final paper assessments were used. Experts validated the assessments and rubrics used. The sampling of this study applies the enumeration method as they were the learners enrolled in the undergraduate ENG102 and ENG103 courses at an international university in Bangkok, Thailand.

Participants

There were four groups in this study—two conventional groups from ENG102 and ENG103 with at least 51 students. Meanwhile, there were also two experimental groups with at least 42 ENG102 and ENG103 students. In total, there were 93 respondents in this study. The researcher of this paper taught all the experimental groups. The students in these classes were between 16–37 years old with diverse nationalities.

Results

Learning Approaches in Terms of Deep Learning Dimensions

Table 1 below shows whether there is a significant difference in the learning approaches of students in terms of dimensions for the control and experimental groups in English 102. Using independent *t*-test, the results showed that for high order thinking, it has $t = 2.439$ and $p = .031$,

Table 1 The significant difference in the learning approaches of students in terms of dimensions for Control and Experimental Groups in English 102

Independent <i>t</i> -test		Mean	<i>t</i>	<i>p</i>
High Order Thinking	Control Group	3.93	2.439	.031
	Experimental Group	4.18		
Integrative Learning	Control Group	3.91	4.987	.001
	Experimental Group	4.29		
Reflective Learning	Control Group	4.05	2.214	.232
	Experimental Group	4.07		
Mean	Control Group	3.96	1.738	.088
	Experimental Group	4.18		

which means significant and denotes the rejection of the null hypothesis. In addition, integrative learning has $t = 4.987$ and $p = .001$, which means that the learning approaches of the students under the control group and the students under experimental group differ. On the other hand, reflective learning has $t = 2.214$ and $p = .232$, which means there is no significant difference and denotes the acceptance of the null hypothesis.

Table 2 below shows whether there is a significant difference in the learning approaches of students in terms of dimensions for the control and experimental groups in English 103. Using independent *t*-test, the results showed that for high order thinking, it has $t = 1.732$ and $p = .225$, which means insignificant and denotes the acceptance of the null hypothesis. Moreover, integrative learning has $t = 0.518$ and $p = .623$, which means that the learning approaches of the students under the control group and the students under experimental group showed no significant difference. Finally, reflective learning has $t = 2.500$ and $p = .130$, which means that there is no significant difference and denotes the acceptance of the null hypothesis.

Table 2 The significant difference in learning approaches of students in terms of dimensions for Control and Experimental Groups in English 103

Independent <i>t</i> -test		Mean	<i>t</i>	<i>p</i>
High Order Thinking	Control Group	4.00	1.732	.225
	Experimental Group	2.00		
Integrative Learning	Control Group	3.33	0.518	.623
	Experimental Group	3.00		
Reflective Learning	Control Group	3.67	2.500	.130
	Experimental Group	2.00		
Mean	Control Group	3.67	1.583	.326
	Experimental Group	2.33		

Academic Performance

Table 3 reveals the significant difference in the academic performance of students when grouped according to the courses. Using an independent sample *t*-test to identify the significant difference, the control groups had $t = -0.931$ and $p = .359$, which is insignificant. This means that the academic performance of students in English 102 and English 103 control groups

Table 3 Result of an independent sample *t*-test for the significant difference in the academic performance of students according to course assessments when grouped according to courses

Group	Mean	<i>t</i>	<i>p</i>
Courses			
Control			
ENG102	3.52	-0.931	.359
ENG103	3.79		
Experimental			
ENG102	3.47	-2.147	.035
ENG103	3.84		

were almost the same. On the other hand, the experimental groups had $t = -2.147$ and $p = .035$, which is significant. This means that the academic performance of students differs in favor of English 103.

The Relationship between Hybrid Classroom and Academic Performance

Table 4 shows whether there is a significant relationship between the extent of use of the hybrid classroom through the dimensions of deep learning (*high order thinking, integrative, and reflective learning*) and the academic performance. Using pearson-r to identify the significant relationship, the results showed significant relationship in high order thinking ($r = -4.298, p = .023$), and reflective learning ($r = -8.586, p = .003$) respectively. However, integrative learning ($r = -3.095, p = .053$) showed no significant relationship. This means that the extent of use of the hybrid classroom and the academic performance of students had a significant relationship both in high order learning and reflective learning. This denotes the rejection of the null hypothesis.

Table 4 The significant relationship between the extents of use of Hybrid Classroom and the Academic Performance

The Hybrid Classroom	Academic Performance	
	<i>r</i>	<i>p</i>
High Order Learning	-4.298	.023
Integrative Learning	-3.095	.053
Reflective Learning	-8.586	.003

The Proposed Hybrid Learning Model

With the results above, it shows that there is a significant difference in the extent use of hybrid classroom in ENG102 compared to ENG103. However, the academic performance showed contradicting results. It shows that the ENG103 experimental group gained significantly higher in academic performance compared to ENG102 experimental group. Moreover, when it comes to academic performance when grouped according to courses, it also demonstrated a significant difference in experimental groups in favor of ENG103, accounting for mean scores 3.84 against 3.47 of ENG102 experimental group. With these, the 50 percent – 50 percent Hybrid Classroom is the proposed hybrid-learning model.

While the hybrid-learning environment provides flexibility when it comes to learners' time management in complying with online tasks as well as flexible time for the instructor in grading the tasks, the face-to-face environment focused on the productive skills. It provided learners more opportunities to interact with peers, instructors, and course materials. These enable a more interactive and better learning environment. The 50 percent – 50 percent hybrid classroom still provided students ample time to interact with the instructor when online course materials and tasks were unclear to them. The pre and post-face-to-face asynchronous tasks also honed students' autonomy in learning through participating in online forums, discussions, and video conferences with peers. These demonstrated congruencies to Ceylan and Kesici's (2017) findings stating that experimental groups' learning experience honed autonomy, enabled learners to interact online and during face-to-face sessions, and resulted in better academic achievement. These demonstrated congruencies to Ceylan and Kesici's (2017) findings stating that experimental groups' learning experience honed autonomy, enabled learners to interact online and during face-to-face sessions, and resulted in better academic achievement.

Discussion and Conclusion

Based on the above findings, it can be inferred that there were significant differences when it comes to the extent of use of the hybrid-learning classroom in the aspects of high order thinking, and integrative learning in ENG102. However, there were no significant differences in reflective learning based on the self-survey questionnaires. In ENG103, it also showed no significant difference in the extent of use of hybrid-learning classroom according to the dimensions. Moreover, the respondents' age, gender, and ethnicity did not influence the results of the use of the hybrid-learning classroom. Interestingly, the use of ENG102 (70% – 30%) demonstrated a significant difference compared to ENG103 (50% – 50%) based on self-survey assessment. This means that having two face-to-face sessions but shortened time works better than meeting the students once per week. This could have been influenced by various factors such as students' sense of autonomy,

especially the Thai students who are still used to the lecturer's guidance and support (Tayjasanant & Suraratdecha, 2016). Although 70 percent – 30 percent hybrid classroom demonstrated a significant difference in the aspects of high order thinking and integrative learning in ENG102 experimental group based on self-survey questionnaires, the ENG103 50 percent – 50 percent experimental groups gained significant difference in academic performance based on course assessments. In short, self-survey questionnaires and actual academic performance show conflicting results. Lastly, the use of hybrid-learning classrooms did significantly correlate to students' academic performance. This result is similar to Ceylan and Kesici's (2017) study on the effects of blended learning on academic achievement, which found out that blended learning approach generated a significant difference in learners' academic performance through course assessments.

The findings of this study bring various implications for teaching and learning. Theoretically, these results support the concept of honing deep learning by providing synchronous and asynchronous activities. Considering that the pre-task of hybrid classroom focused on receptive skills, it enables learners to apply high thinking skills in comprehending the course materials posted on the learning management system ahead of the face-to-face session (Pitler, Hubbel, Kuhn, & Malenoski, 2007; Phillip, 2012). Millennial learners are known to be tech-savvy and very active on social media and online activities; the use of hybrid classroom enables keeping millennial learners' interests and attention (Arnsparger, 2008). The combination of Connectivism and Constructivism approaches, which is the hybrid classroom, addresses this type of learners' fluency in multiple media and simulation-based virtual settings. The hybrid classroom serves as the students' platform to express ideas nonlinearly and achieves balance among experiential learning, guided mentoring, and collective reflection (Dede, 2005 as cited in Le Rossignol, 2014). Interactions are no longer one-way; instead, place the learners at the heart of learning, allowing more interactions synchronously and asynchronously. With the varied activities students' experience, learning becomes more meaningful as theories are put into practice, shying instructors away from the pain of hours of lecturing with bored learners (Ceylan & Kesici, 2017).

Limitations of this research are non-exemptions.

More objective measures and triangulation of results should be employed as self-survey measures can be biased. Secondly, future research can use several instructors delivering hybrid-learning courses. Running and offering hybrid courses in other courses other than English might be more helpful to see the consistencies of this hybrid classroom's effectiveness on learners' performance.

In conclusion, hybrid learning proved to have positive impacts on students' academic performance in the aspects of high thinking skills, integrative learning, and reflective learning. Previous literature has supported these findings. Online learning is the future of education; hence, the results of this study might be significant to the development of hybrid learning modality and keeping better-informed and well-performing workforce. In the Thai context, 50 percent – 50 percent hybrid learning modality is suggested. With proper teacher training, planning, integration of various methodologies and student-centered assessments, and support from university administrators, hybrid learning can successfully equip learners with the skills required of the 21st-century graduates.

Conflict of Interest

There is no conflict of interest.

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