Research Article

STUDENT BLENDED LEARNING:
A SHOWCASE AT DONG NAI TECHNOLOGY UNIVERSITY

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ABSTRACT

This article focuses on analyzing and evaluating students' activities in blended learning to help teachers and educational institution leaders have timely interventions and adjustments to support learners to improve their learning efficiency. The author proposes relevant criteria for monitoring and evaluation based on three aspects including attitudes, technology skills, and learning effectiveness in the online phase of Blended learning. Base on the survey results, four important criteria were given to improve the effectiveness of Blended learning teaching, including (1) To encourage students to spend more time on learning; (2) To support students who have difficulties with technology skills; (3) To provide learning equipment and information technology infrastructure so students in need could borrow and study in specific areas; (4) To provide adjustments in assessment suitable for Blended learning.

Keywords: blended learning; blended learning efficiency; student role in blended learning

1. Introduction

Applying information technology in teaching and learning is more and more widely in the context of traditional education cannot be implemented because of the impact of the covid-19 pandemic. So many higher education institutions have started to be engaging in Blended learning and implement flexible teaching and learning process. Blended learning is "combining or mixing web-based technology to accomplish an educational goal." It also is "combining learning theories (e.g., constructivism, behaviorism, and connectivism) to produce an optimal learning outcome with or without instructional technology. Blended learning is "Combining any form of instructional technology with face-to-face instruction-led training" (Oliver & Trigwell, 2005). This Blended learning approach will change the learning environment and influence students' learning approaches. So implementation of

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blended learning is efficient. More factors should be added to obtain the educational goals, especially under pressure to adjust the form of teaching and learning based on the trend of digital education in a short time. Besides teaching elements, learning materials, infrastructure, and technical technology. Learners play an important decisive role in the effectiveness of education because learners are the center of teaching.Moreover the importance of learning and teaching will vary depending on the teaching method and form. In higher education, the primary orientation training is approached in the direction of personalization of learners, leading to the role of learners in achieving educational goals as a prerequisite. In terms of online teaching and blended learning, the role of learners has specific differences, and there are higher requirements than traditional teaching methods. As confirmed by Arbaugh et al. (2010), the learnerin online classes is a significant factor to be more effective. According to Vu and Nguyen (2019), to be effective in blended learning, it needs to encourage self-awareness, autonomy, and self-study of students. These suggest that learners' important role or learning activities are a crucial factor in determining the success of blended learning.

The education development strategy in Vietnam for 2021-2025 has highlighted that one of the top five tasks is digital transformation in education, especially higher education. Therefore, it can be affirmed that teaching in blended learning will become a booming phenomenon and an inevitable trend in transforming teaching methods to approach education 4.0 nationwide. As discussed above, student learning activities are considered the key factor for blended learning. They are essential in supporting and managing to improve the effectiveness of blended learning.

2. Background

Learning activity "is a unique cognitive activity of learners, learners mainly change themselves and become more and more capable in positive activities of perceiving and improving objective reality" (Nguyen, 2009). According to the modern teaching concept, student learning activities can be understood as the cohesion of students to learning tasks, manifested in three aspects: awareness, behavior, and attitude. In particular, awareness is a key factor in determining students' behaviors and attitudes; however, cognition is a qualitative category that is difficult to measure or evaluate, just based on students' behavior and attitudes to assess cognition.

When approaching blended learning from a learner's perspective, many scholars have studied different factors to make blended learning effective. Van and Elen (2020) have shown that learner-related factors include student attitudes (positive attitudes, ability, time management), learning efficiency (academic satisfaction, self-efficacy, enjoyable experiences), and support factors (experience/benefit, duration of participation, self-motivation, flexibility) in blended learning. Baragash and Al-Samarraie (2018) also indicated that information technology skills might encourage or discourage students from

learning blended learning. More blended learning activities should also be considered by students' participation with the time and effort that students devote to blended learning activities, which relate to willingness, passion, and interest in learning (Barnard et al. 2009). In addition, some researchers have mentioned academic performance in blended learning, as suggested by Anthony et al. (2019), the level of completion and learning outcomes is essential to measure the quality of blended learning.

Based on analyzing factors that affected learning activities and the measurable and evaluable criteria, the article focuses on exploring three aspects of students' blended learning activities that need to be controlled and evaluated: Attitude, Technological skills, and Learning efficiency.

2.1. *Attitude*

Attitude is the external manifestation of perception, influenced through a positive or negative assessment of value, importance, and benefits. Recognizing the benefits of blended learning will impact students' perceptions and attitudes to evoke their willingness to participate in learning activities. In blended learning activities, students' attitudes are determined through the level of engagement and participation in online classes (Lin &Wang, 2012; Poon, 2014). Anthony et al. (2019) also stated that, "students need to spend more time in blended learning." Accordingly, the following items are analyzed for students' attitudes about blended learning activities:

(1) Understand the benefits of combined learning;

(2) Ready to participate in online lessons/discussions;

(3) Complete assigned tasks at online sessions;

(4) Regularly interact with lecturers at online sessions;

(5) Actively search online references for learning.

2.2. *Technology skills*

The fundamental difference between blended and traditional teaching methods is learning activities in the online sessions. At this stage, it is all taken place with the support of technology. Therefore, it is impossible not to mention learners' information technology skills when evaluating blended learning activities. These skills include searching for online information, performing basic functions on MS Excel, MS PowerPoint, and MS Word, and managing online learning software. These are significant skills to enhance learners' willingness to online learning (Hung et al., 2010). The willingness also needs to be determined by assessing information technology tools and devices such as smartphones, laptops, and internet connections because internet speed significantly affects blended learning in online classes.

The effectiveness of blended learning in online classes depends significantly on students' technological skills, which are different for every student in terms of skills in using technology and opportunities for access to technology. They are the reasons why this

research proposed to add the element of equipment when evaluating students' technological skills. As discussed above, necessary criteria for technical skills of blended learning activities include:

(1) Performing office computer skills;

(2) Using and accessing easily online learning software/apps;

(3) Having enough technical tools and equipment (smartphone, laptop) to participate in combined learning;

(4) Being available Internet connections.

2.3. *Learning efficiency*

Learning is a purposeful activity. Learners' learning activities can be directed to many different purposes. Still, they are all linked to the training program's common goal and improving learning efficiency. Learning effectiveness is evaluated based on learning outcomes, knowledge acquirement, skills improvement, or just based on learners' activeness and initiative. Twisg (2003) reported that courses redesigned to include blended learning resulted in students achieving higher grades, more excellent knowledge, and understanding of course concepts. Many authors have shown that blended learning helps learners improve learning outcomes (Boyle et al., 2003; Groen and Carmody, 2005; Iozzi & Osimio, 2012). Based on these issues, in this study, the items are analyzed to evaluate the effectiveness of blended learning:

(1) Be active in finding documents;

(2) Exchange, discuss and interact;

(3) Increase self-study duration;

(4) Improve information technology skills;

(5) Get better academic results.

3. **Research methodology and Results**

3.1. *Research methodology*

The participants in the present study were 1,018 students who attended the blended learning program at Dong Nai Technology University (DNTU) in 2018 and 2021. Among 1,018 students, there are 255 first year students, 317 second year students, 216 third year students, and 230 4th-year students. All students were asked to complete various questions in a survey online by self-reported. The survey had 14 items and used a 5-points Likert scale. The 5-point Likert scale ranged from strongly disagree or negative (1) to strongly agree or positive (5). The survey items are subcategorized as follows:

1. Students' attitudes about Blended learning activities (items 1 to 5)

2. Technological skills of Blended learning activities (items 6 to 9)

3. Evaluating the effectiveness of blended learning (items 10 to 14)

The mean score is effective based on the benchmark scale, where 1=least; 2=worse; 3=everage; 4=good; and 5= very good.

SPSS software (version 20.0) was used to analyze the collected data. The descriptive statistics were used to calculate, including the overall mean and standard deviation. The Cronbach's α value is shown in the following tables

***Table 1.** Indicator Cronbach's α analysis*

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Items 1	52.74	69.074	.810	.710	.961
Items 2	52.62	69.822	.770	.714	.962
Items 3	52.57	69.817	.804	.760	.962
Items 4	52.60	69.852	.789	.710	.962
Items 5	52.72	69.094	.810	.719	.961
Items 6	52.78	68.113	.831	.734	.961
Items 7	52.66	69.102	.821	.717	.961
Items 8	52.89	67.618	.727	.692	.964
Items 9	52.90	67.945	.730	.678	.964
Items 10	52.80	68.434	.840	.743	.961
Items 11	52.85	67.817	.822	.735	.961
Items 12	52.77	68.158	.851	.775	.961
Items 13	52.58	69.394	.800	.724	.962
Items 14	52.87	67.539	.815	.700	.961

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.964	.966	14

SPSS processing showed that the results were very reliable, with Cronbach's α being 0.964

3.2. Results and Discussions

Blended learning has been implemented by DNTU since 2018 with the initial encouragement of lecturers and students to become familiar with combined teaching methods, accounting for 70% of offline teaching activities (traditional teaching methods) and 30% of online teaching activities (E-learning) via LMS. During implementation, DNTU continuously invested in upgrading information technology infrastructure, building studios to create video lectures, and regularly organizing seminars and training for lecturers and students about new methods, especially familiarizing and adapting to online classes in blended learning.

The important factor determining the effectiveness of blended learning is creating a learning environment and managing and maintaining blended learning teaching activities. DNTU has implemented blended learning activities on the Copyright Canvas software system and Microsoft Teams for online learning classes. In addition, due to the impact of the covid-19 pandemic, the duration of online learning classes has been changed from 30% to 70% in 2020 to 100% in 2021.

After nearly three years of implementing blended learning activities (2018 - 2021) with the participation of 1,018 students (participants) from all majors of DNTU, the results of the survey were presented in Table 2 and Table 3.

Table 2. Students' attitudes for blended learning in DNTU (general)

Items	1	2	3	4	5	Sum	Mean	SD
Understand the benefits of combined learning.	2	24	160	559	273	1018	4.06	.731
Get ready to participate in online sessions/discussions	2	19	114	548	335	1018	4.17	.710
Complete the assigned tasks at the online sessions	2	11	103	540	362	1018	4.23	.683
Participate/Interact frequently with lecturers at online lessons	3	11	113	550	341	1018	4.19	.692
Take time to search online references for learning	3	21	155	557	282	1018	4.07	.730
Overall							**4.14**	

Table 2 shows that students already have good awareness and a positive attitude when participating in Blended learning activities. In particular, "Understanding the benefits of combined learning" had the lowest mean (4.06), and "Taking time to search online references for learning" had the second lowest mean (4.07). "Taking time for learning" is also mentioned by many researchers, such as Chong et al. (2010) mentioned about the time management issues in "Perceptions of student teachers in a blended learning environment".

Besides, analyzing each group of students in different years showed that the first year students had the best attitude in learning toward blended learning. This result could be explained understanding that the first-year students could adapt to new learning methods better than the other year students and were forced to learn in the context of covid-19. Table 3 showed that the learning attitudes of the second year students were better than third and fourth year students. The results also shows that, "Take time to search online references" and "Understand the benefits of combined learning" were evaluated with the lowest results among the items asked. Therefore, DNTU needs solutions to raise students' awareness of blended learning activities' benefits and encourage students to spend more time looking for learning materials.

Table 3. Students' attitudes in blended learning in DNTU
(classified by group year students)

Items	1st-year students		2nd-year students		3rd-year students		4th-year students	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Understand the benefits of combined learning.	4.30	.633	4.06	.773	3.94	.729	3.90	.708
Get ready to participate in online sessions/discussions	4.41	.580	4.15	.746	4.10	.718	4.02	.721
Complete the assigned tasks at the online sessions	4.45	.558	4.16	.749	4.14	.691	4.14	.655
Participate/Interact frequently with lecturers at online lessons	4.40	.619	4.14	.733	4.10	.705	4.13	.654
Take time to search online references for learning	4.27	.624	4.06	.783	3.93	.777	4.01	.674
Overall	**4.37**		**4.11**		**4.04**		**4.04**	

Regarding "technology skills," the survey results showed that nearly all students had good technological skills. They had enough technical tools to participate in online learning activities (overall mean: 3.99). As presented in Table 4, students' technology skills had a higher mean (4.01; 4.14); meanwhile, students' device and internet conditions got lower GPAs in the criteria group (3.91; 3.90). Analyzing the number of students who chose levels 1 and level 2 on a 5-level scale, it showed that 35/1,018 (3.44%) students had not yet fulfilled their office computer skills; 24/1,018 (2.36%) students had difficulty using and accessing online learning software; 86/1,018 (8.45%) did not have enough technical tools and means to participate in online learning lessons, and 73/1,018 (7.17%) had difficulties connecting to the internet. Therefore, there needs to be support for these students to make Blended learning more effective. The results of the survey are presented in Table 4 and Table 5.

Table 4. StudentTechnology Skills in blended learning in DNTU (general)

Items	1	2	3	4	5	Sum	Mean	SD
Performing office computer skills	5	30	184	526	273	1018	4.01	.782
Using and accessing easily online learning software	5	19	116	568	310	1018	4.14	.720
Having enough technical tools, equipment (smartphone, laptop)	15	71	177	483	272	1018	3.91	.919
Being available Internet connections	8	65	216	461	268	1018	3.90	.890
Overall							**3.99**	

Besides, analyzing each group of students in different years showed that the 1st-year students had the best technical skills with all the items asked. Among the four items that were asked, "Using and accessing easily online learning software" had the best rate. The cause of this result was the students were young enough to approach information technology and easily used communication tools for learning. As shown in Table 5, "Being available Internet connections" had the lowest results. It indicated that internet connections also were a problem that neededed to be invested to be available and uninterrupted. Internet connections are what many researchers mentioned, for example, Akpan (2015) said that, "Poor Internet connectivity has been reported to inhibit students' ability to engage in online discussions, which could lead to considerable frustration and have a negative impact on learning." (p.7)

Table 5. *Students' Technology Skills in blended learning in DNTU*
(classified by group year student)

Items	1st-year students		2nd-year students		3rd-year students		4th-year students	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Performing office computer skills	4.23	.718	3.99	.825	3.83	.791	3.98	.730
Using and accessing easily online learning software	4.36	.655	4.15	.715	3.96	.743	4.05	.713
Having enough technical tools, equipment (smartphone, laptop)	4.13	.912	3.96	.887	3.68	.963	3.81	.869
Being available Internet connections	4.14	.883	3.96	.858	3.62	.886	3.82	.867
Overall	**4.22**		**4.02**		**3.77**		**3.92**	

The survey results showed that students blended learning activities effectively with an overall score of 4.02. In particular, the content by which students evaluated themselves effectively are *Exchange, Discussion, and Interaction* (Mean: 4.21) and *Improved information technology Skills* (mean: 4.04). However, the criteria *Get better academic results* had the lowest evaluation results and had many different opinions (Mean: 3.93; SD 0.837). There could be many causes, one of the proposed causes is the form and method of testing and evaluation of learning results suitable for Blended learning. The following table shows the information.

Table 6. *Students' Academic Performance in blended learning in DNTU (general)*

Items	1	2	3	4	5	Sum	Mean	SD
Be active in finding documents	2	29	192	545	250	1018	3.99	.753
Increase self-study duration	6	43	200	522	247	1018	3.94	.812
Improve information technology skills	4	30	167	547	270	1018	4.03	.763
Exchange, discuss and interact	2	17	113	517	369	1018	4.21	.717
Get better academic results	8	46	210	502	252	1018	3.93	.837
Overall							**4.02**	

Table 7. *Students' Academic Performance in blended learning in DNTU*
(classified by group year student)

Question	1st-year students		2nd-year students		3rd-year students		4th-year students	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Be active in finding documents	4.15	.711	3.99	.790	3.89	.799	3.93	.673
Increase self-study duration	4.13	.736	3.92	.846	3.81	.842	3.88	.781
Improve information technology skills	4.25	.677	4.01	.803	3.89	.779	3.93	.730
Exchange, discuss and interact	4.46	5.86	4.18	.753	4.11	.751	4.07	.699
Get better academic results	4.18	.722	3.88	.893	3.75	.884	3.87	.769
Overall	**4.23**		**4.00**		**3.89**		**3.94**	

As shown in Table 7, "Increase self-study duration" had the lowest results as assessed by 1st-year students. It showed that they need to be supported in ow to learn self-study. Besides, "Get better academic results" had the lowest results as assessed by 2nd-year, 3rd-year, and 4th-year students. It indicated that blended learning did not improve their academic results as compared to F2F offline mode.

Overall, the survey results confirmed that Blended learning positively impacted students and improved valuable skills for learners.

One exciting study results is that the 1st and 2nd-year students can adapt to blended learning adoption better than 3rd and 4th-year students. The cause of these results was behavior because 3rd and 4th-year students only learned toward F2F learning models. So their perception of blended learning is more complicated.

4.   Conclusion

Blended learning is an inevitable trend in the future with the duration or proportion of learning in online classes with the prediction that it will be more than in offline learning classes. So, student learning activities play an important role in improving learning

efficiency. Our results confirm that lecturers, faculties, and departments of DNTU need to adjust the following four criteria for blended learning activities to be better: (1) Encourage students to spend more time studying; (2) Timely support students who have difficulties with technological skills; (3) Provide learning equipment and information technology infrastructure so that students difficult circumstances can borrow and study in specific areas; (4) Change the form of assessment that is suitable for blended learning.

❖ ***Conflict of Interest:*** *Authors have no conflict of interest to declare.*

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THỰC TRẠNG HỌC TẬP BLENDED LEARNING CỦA SINH VIÊN TRƯỜNG ĐẠI HỌC CÔNG NGHỆ ĐỒNG NAI

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TÓM TẮT

Bài viết này phân tích và đánh giá hoạt động Blended learning của sinh viên nhằm giúp giảng viên và cơ sở giáo dục có những can thiệp và điều chỉnh kịp thời để hỗ trợ người học nâng cao hiệu quả học Blended learning. Trên cơ sở ba khía cạnh gồm thái độ, kĩ năng công nghệ và hiệu quả học tập trong pha trực tuyến của hoạt động học Blended learning, bài viết đề xuất các tiêu chí liên quan cần giám sát, đánh giá. Thông qua kết khảo sát, bài viết đưa ra 4 tiêu chí quan trọng để nâng cao hiệu quả dạy học Blended learning, gồm: (1) Khuyến khích sinh viên dành nhiều thời gian cho việc học; (2) Hỗ trợ kịp thời những sinh viên gặp khó khăn về kĩ năng công nghệ; (3) Cung cấp thiết bị học và hạ tầng công nghệ thông tin để sinh viên khó khăn có thể mượn và học tại khu vực nhất định; (4) Điều chỉnh hình thức đánh giá phù hợp với dạy học Blended learning.

Từ khóa: *học học tập kết hợp; hiệu quả học kết hợp; vai trò của sinh viên trong học tập kết hợp*