Library Progress International
Vol.44, No.3, Jul-Dec 2024: P.285-293

Print version ISSN 0970 1052
Online version ISSN 2320 317X

Original Article

Available online at www.bpasjournals.com

Blended Learning On Academic Performance And Attitude Of Students At Wvsu-Pototan

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How to cite this article: Janet A. Francisco (2024). Blended Learning On Academic Performance And Attitude Of Students At Wvsu-Pototan, 44(3), 285-293

ABSTRACT
The study aimed to ascertain if blended learning at West Visayas State University's Pototan Campus is beneficial in raising students' academic performance in Systems Analysis and Design. Students from the School of Information and Communications Technology participated in the study and were split into control and experimental groups. A modified Adlawan et al. questionnaire was utilised to gauge students' attitudes toward blended learning, while a 50-item researcher-made test was used to gauge academic performance. The findings showed that the students had 'outstanding' academic achievement before adopting blended learning. This high level of performance sets a benchmark for continuous improvement. The students also had a 'negative' attitude towards blended learning before its adoption, but this changed to a 'positive' attitude after implementation. The experimental group's academic performance improved to 'excellent,' while the control group's performance remained 'excellent.' A significant difference was found between the experimental group's pre-test and post-test regarding their academic performance, indicating the effectiveness of blended learning. In contrast, a substantial difference between the pre-test and post-test of the control group was not found. Moreover, no significant difference was found in the students' attitudes towards blended learning before or after the introduction of blended learning.

Keywords: Academic performance, Attitude, Blended learning, Systems Analysis and Design

INTRODUCTION

Education is no longer just about memorising facts but is now being improved through technology-assisted teaching methods and blended learning models. Blended learning combines the best aspects of face-to-face teaching and online instruction, allowing students to learn at their own pace. It is a scalable learning model that works for diverse populations of students and does not merely duplicate course content in varying formats. The rationale for providing blended learning experiences may vary widely across colleges and universities. However, examining how students experience the course and their feedback on its effectiveness is crucial. Effectiveness has several underlying factors that pose challenges, such as how users can successfully use the technology and ensure participants' commitment given individual learner characteristics and encounters with technology. (Panopto, 2019).

Furthermore, when academic performance talks about how students accomplish their responsibilities, which are influenced by some factors that determine the status and the rate of students' learning performance. Ability is a talent, skill, or proficiency in a particular discipline. It is what students can do, given the ideal circumstance. Many can think of it as internal and hidden until they show their knowledge and skills through various learning tasks. Singh (2016) states that educational students are the most critical asset. The student's academic performance plays a vital role in producing outstanding quality individuals who will become leaders and workforce of a particular country, consequently responsible for the country's social and economic development. The academic performance of the students has gained significant attention from past researchers. Previous studies on students' academic performance focused on teacher education, family, educational background, gender difference and socio-economic factors. Additionally, as Shakeel and Peterson (2020) emphasised, education is one of the most significant parts of human resource development.

Academic performance starts with mindset and the student's attitude. Researchers measured students' attitudes as they transitioned to college, a particularly challenging time for adolescents. The students started with similar grades, but after the transition with its new challenges, the grades of fixed-mindset students declined, while those of growth-oriented students improved. This performance demonstrates the link between student attitude and academic performance.

The fixed-mindset students tried rationalising their poor grades with explanations such as "I am not good, or they blamed the teacher. They viewed the change as threatening because it could expose them as failures.

In contrast, the growth-minded students faced the more challenging environment by doubling down and working harder. They welcomed the opportunity to learn what they liked and what they might achieve. This mindset is the power of student attitude on academic performance. (Dweck, 2020).

2. LITERATURE REVIEW

2.1. Pioneers of Distance, Online and Blended Learning in the Philippines

The Open University in the Philippines, a pioneer in the field, began its journey in the 1970s with the Polytechnic University of the Philippines (PUP) offering non-degree online courses. The university adopted a blended approach, requiring students to attend formal lectures and face-to-face assessments. In the 1990s, PUP's distance education program expanded to offer degree courses. In 1995, the University of the Philippines established Open University (UPOU) to provide continuing education and meet students' specific needs. PSU-OU, another trailblazer, provides technical expertise and professional growth to northern Luzon and Visayas Filipino students specialising in fisheries, agriculture, education, management, and technology. In 1997, Central Luzon State University (CLSU) joined the movement, opening its distance education program and offering non-degree and degree courses to those unable to participate in traditional modes of instruction. More universities and colleges in the Philippines have carried the torch of innovation, including Philippine Normal University, Philippine Women University, Pamantasan ng Lungsod ng Maynila, and De La Salle University.

2.2. Students Attitudes and Satisfaction Towards Blended Learning in the Health Sciences

The study examined students' attitudes and satisfaction towards a blended learning research course at King Saud University. Fifty-one female undergraduate senior students participated for two semesters. Results showed that team-based learning was the most preferred tool, with collaborative learning being the most preferred. Students' interactions with peers helped them process course content and adapt to multiple perspectives. Peer discussions enhanced learning outcomes due to students' variable learning aptitudes. Digital information tools were the most preferred outcome, and team-based learning was the most preferred structure. The study revealed a high positive attitude and motivation among students.

2.3. Technology and Its Impact on Academic Performance

Huberman (2020) asserts that the online world has significantly transformed in the past decade. Technological advancements have empowered young people to transmit thoughts, emotions, private information, images, and videos at an unprecedented rate. According to Oberst (2010), 73% of American teenagers now use social media websites. This surge in digital connectivity has the potential to revolutionise academic performance, offering new avenues for learning and collaboration.

Martin (2020) and Lusk (2020) also discuss social media from the same perspective. They view social media as a powerful tool for communication and idea sharing, encompassing websites like Facebook, Blogs, Twitter, My Space, and LinkedIn. In this study, social media is considered a part of internet usage, facilitating conversation, idea sharing, and photo sharing through platforms like Facebook, WhatsApp, Twitter, Skype, MySpace, and Yahoo Messenger. These platforms could foster a sense of community and engagement among users.

2.4. Attitudes and Beliefs

According to research findings, teacher attitudes and views regarding technology may be one of the main obstacles to effective technology integration in K–12 education (Hew & Brush, 2020). In the literature, attitudes and beliefs

are often described as different constructs: attitudes refer to sentiments showing favour or disfavour, whereas beliefs are premises about something true (Calderhead, 1996; Simpson et al., 1994; Wesely, 2012). An attitude is an individual's viewpoint or disposition containing affective, cognitive, and behavioural components, according to a more detailed definition provided by Gall and Borg (2003). The cognitive component is one's views or knowledge about the attitude object. Understanding the connections between cognitive structure (i.e., beliefs), emotion, and attitude (Bodur et al., 2000).

2.5. Pioneers of Distance, Online and Blended Learning in Asia

The first university in Asia to provide distance learning was Allama Iqbal Open University in Pakistan. The Pakistani government founded and funded this Open University in 1974 to provide education to those working or living at home. The primary objective was to raise the literacy rate, particularly among women in isolated rural regions, thereby empowering them and contributing to the socio-economic development of these regions. The Sri Lanka Institute of Education (SLIDE) was established in 1976, marking the beginning of distance and blended learning in Sri Lanka. The Open University of Sri Lanka was founded by SLIDE in 1980, and the first courses were intended to provide adult education and further teacher training (Samaranayake et al., 2009). Online and remote learning in India may be traced back to correspondence schools, similar to schools.

3. OBJECTIVES OF THE STUDY

The study's main objective is to determine the effect of blended learning on students' academic performance and attitude at the WVSU-Pototan campus. Specifically, this study aims to:

1. Develop a module for the Systems Analysis and Design subject.
2. Determine the academic performance of the experimental and control group before and after the introduction of the module.
3. Determine the attitude of the experimental and control group towards the subject before and after the introduction of the module.
4. Determine if there is a significant difference between the academic performance of the experimental and control group before and after the introduction of the module.

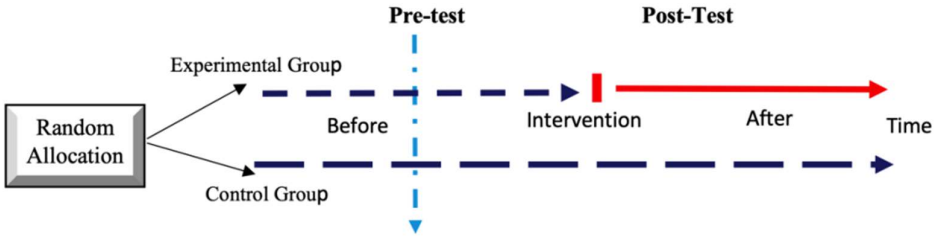

Figure 1. Conceptual Paradigm of the Study.

4. METHODOLOGY

The blended learning was introduced, and both groups were given a pre-test to determine their academic performance and attitude. A 50-item researcher-made test was used to determine academic performance. This test was rigorously tested for reliability and validity, with a KR-21 coefficient of 0.87, indicating its reliability. To ensure the test's validity, it was reviewed by the knowledgeable faculty from the School of Information and Technology of WVSU-P.C. The students' attitudes were assessed using an adapted questionnaire from Falah and Chairuddin (2022). After the pre-test, the control group continued with traditional face-to-face classes, while the experimental group adopted the blended learning method. After eight weeks of blended learning, a post-test was administered to the students.

4.1. Research Design

The study employed a rigorous quasi-experimental research design to determine the effect of blended learning on students' academic performance and attitude. The respondents were the students from the two sections of 2nd-year B.S. Info Tech students of WVSU-PC. They were selected using the matched-paired method, ensuring a balanced representation. One of these sections was assigned as the control group, while the other was assigned as the experimental group. The experimental group was subjected to blended learning, while the control group utilised the traditional face-to-face method, providing a clear basis for comparison.

Before introducing blended learning, both groups were given a pre-test to determine their academic performance and attitude. A 50-item researcher-made test was used to determine academic performance. This researcher made the test undergo reliability and validity testing. KR-21 was used to determine the reliability of the test. To ensure

the test was valid, it undergoes validity, and the validators were the faculty from the School of Information and Technology of WVSU-P.C. As for the attitude of the students, an adapted questionnaire from Falah and Chairuddin (2022) was used. After the pre-test, the control group continued their class using the traditional face-to-face method, while the experimental group utilised the blended learning method. After eight weeks of implementation of blended learning, a post-test was given to the students. This study employed descriptive and inferential statistics to analyse the data gathered from the respondents. Descriptive statistics used mean and standard deviation. Mean was used to describe the student's academic performance and attitude, while standard deviation was used to describe the homogeneity of the population.

4.2. Respondents and Sampling Plan

The study sample comprised 2nd-year ICT students enrolled at WVSU-Pototan, 2nd semester for the academic year 2021-2022. The participants were purposefully selected from two classes and then divided into experimental (33 students) and control groups (32 students), which studied Systems Analysis and Design via Blended and traditional methods, respectively. The selection process was based on specific criteria to ensure a representative sample. An experimental pattern with a pretest-posttest control group was used in the study. The study group comprises 65 students – 33 in the experimental group and 32 in the control group.

4.3. Instrument and Data Gathering Procedure

The study was conducted at the West Visayas State University – Pototan Campus (WVSU-PC), specifically within the School of Information and Technology. The participants were 2nd-year students enrolled in the Bachelor of Science in Information Technology (B.S. Info Tech) program. The sample included two sections of these students, composed of 30 students in each section. The participants were selected using a matched-pair method, with one section designated as the control group, which continued with traditional face-to-face learning. In contrast, the other section was assigned to the experimental group, which experienced a blended learning approach combining online and face-to-face instruction. The study employed a validated 50-item researcher-made test, which showed a reliability coefficient of 0.87, to measure academic performance. Attitude was assessed using an adapted questionnaire from Falah and Chairuddin (2022). The intervention lasted for eight weeks, during which blended learning was implemented for the experimental group. Data analysis involved descriptive statistics, including mean and standard deviation, to evaluate academic performance and student attitudes, and inferential statistics to further analyse the data through specific methods, ensuring a comprehensive evaluation of the student's performance and attitudes.

Furthermore, the evaluation based on the module prepared is composed of 9 Chapters and the 50-item test made by the researcher was based on the different chapters, such as Chapter 1: Systems Analyst and Information Systems, which is composed of sub-topics: Lesson 1: Introduction, Lesson 2: The systems Analyst skill, Lesson 3: System analyst roles and Lesson 4: Characteristics of a System. Chapter 2: Unit II: Development Life Cycle (SDLC) and the following are sub-topics: Lesson 1: SDLC Methodologies, Lesson 2: Project Identification and Initiation, Lesson 3: Applying the concepts, Lesson 4: Feasibility Analysis. For the Chapter, the topic is all about Project Selection. The sub-topics include Lesson 1: Sources of Project Request, Lesson 2: Getting Information from the Existing Information System, Lesson 3: Prototyping, Lesson 4: Preliminary Investigation, Lesson 5: Scope of Study, Lesson 6: Conducting the Investigation, Lesson 7: Reviewing Organization Documents, Lesson 8: Conducting Interview, Lesson 9: Testing Project Feasibility and Lesson 10: Handling Infeasible Projects.

Lastly, here are the sample questions to gather in-depth feedback from students to determine the effectiveness of the mode of learning, technology, and training and, most of all, the effectiveness of the test and the module content.

- How did your experience with the blended learning approach, which combines online and face-to-face instruction, compare to the traditional face-to-face learning method? Please describe specific aspects of each method that you found beneficial or challenging.
- How did the technology used during the blended learning mode impact your learning experience? Were there any specific challenges or advantages you encountered with the technology and training related to the blended learning approach? How did these factors influence your overall performance and engagement in the course?
- How practical were the 50-item test and the content of the nine chapters in assessing your understanding of the topics covered, such as Systems Analysis, SDLC, and Project Selection? What areas of the test or modules did you find most relevant to your learning, and which areas could be improved?

4.4. Data Analysis

Descriptive statistics used mean and standard deviation. Mean was used to describe the student's academic performance and attitude, while standard deviation was used to describe the homogeneity of the population.

For the Interpretation of the mean, the following scale will be used:

A. For the level of Academic Performance of the students

Scale	Description
40.01-50.00	Excellent
30.01-40.00	Very Good
20.01-30.00	Good
10.01-20.00	Poor
1.00-10.00	Very Poor

B. For the Attitude of the students

Scale	Description
1.51-2.00	Positive
1.00-1.50	Negative

For the inferential statistics, this study used a paired t-test to determine whether there was a significant difference in the student's academic performance from the control and experimental groups before and after introducing blended learning.

To interpret the results of the inferential statistics, the following scale was used:

Scale	
p<.05	Significant
p>.05	not significant

4.5. Ethical Considerations

The study's conduct has been guided by ethical values as outlined in the Code of Ethics. The researcher asked the subjects' consent to participate voluntarily, putting their welfare first. Anonymity was preserved, they were identifiable by number coding, and official correspondence was sent via email. The researcher gave them the assurance that the data would only be utilized for that purpose. The researcher deleted the data from hard copies of the study and from a backup CD and password-protected computer six months after finishing the final report.

5. RESULTS AND DISCUSSION

5.1. Developed a Module for Systems Analysis and Design Subject

The module, designed specifically for Second-year students in the Bachelor of Science in Information Technology and Bachelor of Science in Information Systems programs, is offered every 2nd semester. It was meticulously crafted based on the syllabus provided by the instructor, checked by the program head, recommended for approval by the director, and ultimately approved by the Dean of Academic Affairs, with the sole purpose of enhancing your academic journey.

Furthermore, to ensure the validity of our research, we administered pre-tests and post-tests to both the experimental and control groups. These tests were designed to determine the equivalence of the research variables and provide us with preliminary information. Three experts validated the written questionnaires used in these tests, further ensuring the accuracy of our findings.

Moreover, three instructional technology experts have rigorously validated the module's eight chapters of content. This validation process ensures that the module is of the highest quality and will effectively contribute to your learning experience.

5.2. Students' Academic Performance under the Experimental and Control Group Before and After Blended Learning was introduced.

Results of the study revealed that the academic performance of the students in the experimental group improved the most, with the pre-test (m=34.14, SD=7.95) described as "very good" and post-test (m=43.17, SD=2.80) described as "Excellent". It could also be noted that the control group has minimal improvement in academic performance after the implementation of blended learning, with pre-test (m=34.21, SD=2.51) described as "very good" and post-test “(m=34.28, SD=2.79) described as “very good”.

5.3. Participants' Demographics

Table 1

Academic Performance of the Students under the Experimental and Control Before and After Blended Learning was Introduced

Groups	Pre-test			Post-test		
	Mean	SD	Description	Mean	SD	Description
Experimental Group	34.14	7.95	Very Good	43.17	2.80	Excellent
Control Group	34.21	2.51	Very Good	34.28	2.79	Very Good

Table 2

The Attitude of the Students under the Experimental and Control Group Before and After Blended Learning was Introduced

Groups	Pre-test			Post-test		
	Mean	SD	Description	Mean	SD	Description
Experimental Group	1.42	0.28	Negative	1.79	0.21	Positive
Control Group	1.49	0.23	Negative	1.70	0.21	Positive

Table 2 shows the attitudes of the control and experimental groups before and after implementing blended learning. Before the blended learning was implemented, the attitudes of both the control group (m=1.49, SD=0.23) and the experimental group (m=1.43, SD=0.28) were "negative." After the implementation of blended learning, the attitudes of both the control (m=1.49, SD=0.23) and the experimental group (m=1.79, SD=0.21) improved to "positive."

Table 3

Significant Difference Between the Academic Performance of Students under the Experimental and Control Group Before and After Blended Learning was Introduced

Groups	Attitude of Students	Mean	df	t	Sig
Experimental Group	Before Blended Learning	34.14	28	6.77	0.00
	After Blended Learning	43.18			
Control Group	Before Blended Learning	34.21	28	0.42	0.68
	After Blended Learning	34.28			

There was a Significant Difference Between the Attitudes of Students in the Experimental and Control Groups Before and After Blended Learning was introduced. The study's results revealed a significant difference between the students' attitudes before and after implementing blended learning, both for the experimental and control groups. This result means that blended learning could help improve the students' attitudes.

Table 4

Significant Difference between the Attitude of Students under the Experimental and Control Group Before and After Blended Learning was introduced

Groups	Attitude of Students	Mean	df	t	Sig
Experimental Group	Before Blended Learning	1.43	28	6.52	0.00
	After Blended Learning	1.79			
Control Group	Before Blended Learning	1.49	28	4.63	0.00
	After Blended Learning	1.70			

6. CONCLUSIONS AND RECOMMENDATIONS

Based on the findings, the following conclusions were drawn:

1. A module on [specific aspects of Systems Analysis and Design] was developed for the Systems Analysis and Design Subject. The student's academic performance in both the experimental and control groups before implementing blended learning was very good. After implementing blended learning, the student's academic performance in the experimental group improved to excellent. In contrast, the student's academic performance in the control group remained very good.
2. The students' attitudes in the experimental and control groups before implementing blended learning were negative, primarily due to [specific reasons]. After the implementation, the students' attitudes from

both groups were positive. There was a significant difference in the student's academic performance in the experimental group before and after implementing blended learning.
3. There was no significant difference in the student's academic performance in the control group before and after implementing blended learning.
4. There was a significant difference in the student's academic performance in the experimental and control groups before and after implementing blended learning.

Based on the above conclusions, the following recommendations were made:
1. The success of blended learning in this study suggests its potential to enhance students' learning experiences in the future significantly. The module, designed for the Systems Analysis and Design Subject, has proven to be a valuable tool for students, offering them a more systematic and practical approach to learning. The developed module will be utilised in the CC 207 subject, Systems Analysis and Design.
2. Future researchers may look for other modalities, such as [specific modalities], that they could use to help students understand and appreciate the subject.

7. ACKNOWLEDGEMENT

- First and foremost, I praise and thank God, the Almighty, for his blessings throughout my research work, which enabled me to complete the research successfully.
- I want to express my deep and sincere gratitude to my research colleagues for allowing me to do research and providing invaluable guidance throughout this research. Their dynamism, vision, sincerity and motivation have deeply inspired me.
- I also extend my heartfelt thanks to Dr. Rosie Jane P. Siosan and Dr. Josephine L. Lavilla for their invaluable insights and advice, which made this research possible, and for formulating the statistical results.
- I am also extremely grateful to our Research Campus Coordinator, Dr. Raquel Pedrajas, for her advice and mentoring me regarding cash advances and other financial matters.
- The evaluators and respondents of the study.
- A special thank you to Dr. Karlo S. Sira for his assistance in getting my research published.
- Above all, to our God Almighty, the most powerful, for the knowledge, wisdom, courage, patience, and determination to hurdle all the obstacles in making this research possible.
- Thank you very much!

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