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Research Article

Unraveling the Effectiveness of Blended Learning: Key Factors for Effective Implementation from the Perspective of Senior High School Students

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ABSTRACT

Blended learning integrates in-person and online learning, resulting in a flexible learning environment. The main objective of this study is to determine the perceived level of blended learning effectiveness among Grade 12 STEM students from a Philippine private university based in the City of Manila. It also examined the relations between the learners' attitudes, level of efficacy in using the LMS, and academic support received from parents and teachers. A total of 202 SHS students answered the survey questionnaire. Descriptive statistics, Spearman Rho, and multiple regression were employed to analyze the data. Findings show a positive attitude of the learners on the use of blended learning as a mode of learning ($\tilde{x}$ = 4), high self-efficacy on the use of LMS ($\tilde{x}$ = 4), high academic parental support ($\tilde{x}$ =4) and high teachers' support ($\tilde{x}$ = 4). The findings of their perceived effectiveness of blended learning show a high rating with a $\tilde{x}$ = 4. The Spearman Rho tests found each variable's correlation with blended learning effectiveness. Both instructors' academic support for students and learners' attitudes had a strong positive correlation; LMS self-efficacy had a moderately positive correlation, while parents' academic support had a weak positive correlation. Multiple regression tests revealed that learners' attitudes, academic support from parents and teachers, and students' level of efficacy in using the LMS design feature all predict effective blended learning.

Keywords: *Blended learning, Learner's attitude, LMS efficacy, Parental support, Teacher's support*

Introduction

Blended learning (BL) combines face-to-face and online instruction (Graham, 2006, as cited in Hrastinski, 2019). In the Philippines, the Department of Education (DepEd) reported that 51.8% of students had adopted BL

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(Hernando-Malipot, 2022). It was also reported that the wide range of online and hybrid learning improves the educational tools that provide the best learning experience for students (Oxales, 2022).

Studies conducted in the Philippines regarding blended learning found that students performed better on tests with more BL instruction than those subjected to less BL instruction (Hipol et al., 2019). A study by Villanueva et al. (2023) also showed that blended learning interactions in the K–12 setting have a positive experience as teachers and students have a sense of continuity throughout their school activities and communications. Tertiary students' personal experiences of post-pandemic BL in the Philippines were reported to be beneficial in a study by Guillen (2022), as the students believe that they have become more effective learners through BL and are adaptive to an emergency remote learning environment. However, there remain gaps in blended learning research, such as lack of parental support, lack of research on Canvas used as LMS, and lack of research on senior high school (SHS) STEM students.

Studies found that students' positive attitudes toward BL can improve their academic performance (Yu, 2021). It is also regarded as a suitable learning mode (Mahasin et al., 2021), as students perceive it to be more effective than traditional learning (Aladwan et al., 2018).

A learning management system (LMS) improves students' learning (Muthuruman, 2018). Technology was revealed to be a strong predictor of good academic performance (Jaggars et al., 2016). Students' efficacy in using the LMS shows a positive relationship with BL satisfaction (Prifti, 2020). However, a study by Tus et al. (2021) revealed no relationship between LMS usage and students' academic performance.

Studies on parents' academic support investigated the link between parental involvement and students' academic achievement (Yau, 2021), as well as academic performance (Lara & Saracostti, 2019; Choe, 2020) and self-regulated learning (Choe, 2020). Studies also looked into the relationship between the lack of parental support and academic performance (Tolentino & Arcinas, 2018).

Numerous studies look into the academic support from teachers received by undergraduate students (Naseer & Rafique, 2021; Amadi et al., 2017). The studies explored the impact of teachers' academic support on students' satisfaction with online learning, academic motivation (Naseer & Rafique, 2021), and academic emotions (Lei et al., 2018).

Studies confirm that interactions with peers and lecturers positively impacted BL (Bouilheres et al., 2020). Academic performance and motivation are also proven effective indicators in BL, and student interactions between learners and teachers significantly predict academic motivation (Kintu et al., 2017).

Research Objectives

The primary goal of this study is to determine the perceived effectiveness of BL as a mode of instruction among Filipino SHS students and its relationships with their attitudes toward BL, students' level of efficacy in using the LMS design features, and levels of academic support received from their parents and teachers.

Conceptual Framework

In this study, independent variables include the learner's attitude, the student's level of efficacy in using the LMS features, and academic support from parents and teachers. Learners' attitude refers to the students' perceived effectiveness of BL on interaction with peers and teachers, preference for mode of instruction, and effect on learning skills and processes. Students' self-efficacy in using LMS refers to the usability of its tools and resources. Academic support from parents refers to parents' contribution and involvement being experienced by students to improve their performance in school in terms of financial support, time, advice, and regular communication received by the student. Academic support from the teachers refers to the teacher's assistance to the student to improve performance in the school. It includes domains such as student-teacher regular communication, technical/subject feedback from teachers, and the teacher's topic mastery.

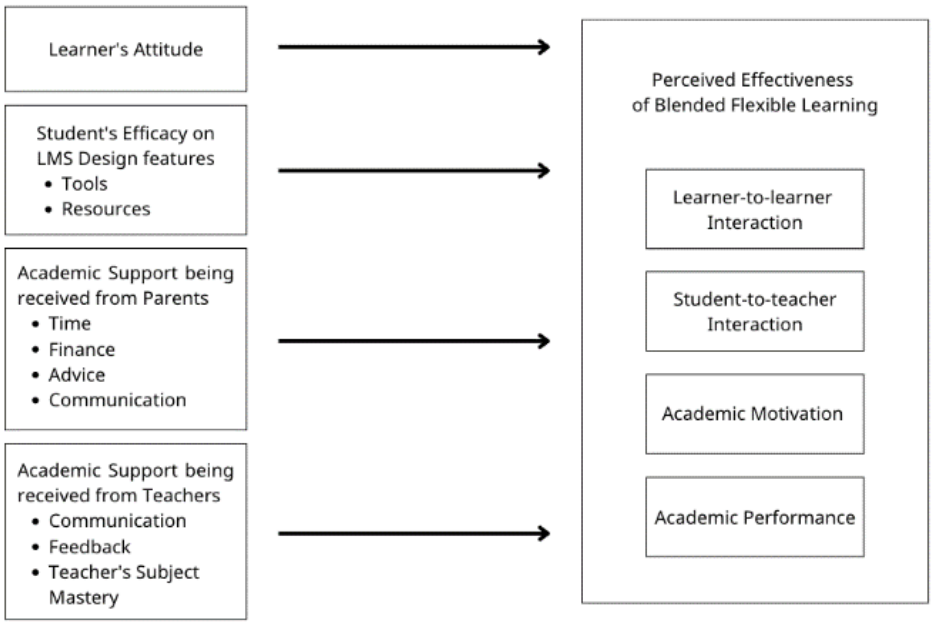

Figure 1. Conceptual Framework

The dependent variable refers to students' perceptions of the BL's effectiveness, which includes dimensions such as academic motivation, academic performance, learner-to-learner interaction, and student-to-teacher interaction. This study refers to academic performance as a measurement of student achievement. Academic motivation refers to the students' desire in these subjects that affect their academic achievement. Learner-to-learner and student-to-teacher interactions refer to student interactions with their teacher and peers. This assumes that all identified independent variables predict the effective use and implementation of BL as an instructional method.

Methods

Research Design

This study used an explanatory-quantitative research design. It aimed to determine the perceived level of effectiveness of BL as a mode of instruction and identify its predictors. An online survey was used as method of data collection and self-administered structured questionnaire was employed to collect the required data.

Population Sampling

Purposive non-probability sampling was utilized to identify respondents. A total of 202 senior high school students aged 18-19, living with both parents and belonging to a particular Philippine private university based in the City of Manila, participated in the survey. This study focused on the BL of 12th graders during their first term of the academic year 2022-2023 (September to December 2022). The students used the official LMS, which was Canvas by Instructure.

Instrumentation

An online self-administered survey questionnaire with seven modified scales from previous studies was used. It utilized a 5-point Likert scale from 1 (never) to 5 (always).

To measure learners' attitudes, a modified questionnaire by Aladwan et al. (2018) was adopted ($0.8>\alpha\geq0.7$). To measure students' efficacy on the LMS design features, a modified questionnaire by Kan et al. (2020) was used ($\alpha\geq0.94$). To measure academic support received from parents, the Perception of Parenting-College Student Scale (POP-CSS) used by Yau et al. (2021) was implemented ($0.8>\alpha\geq0.7$). A modified questionnaire from Amadi et al. (2017) was used to measure academic support received from teachers ($0.8>0.7$).

Under dependent variables, a questionnaire developed by Bouilheres et al. (2020) was

used for this study to measure learner-to-learner interaction and teacher-to-learner interaction (α≥0.9). To measure academic motivation, the Academic Motivation Scale utilized in the study of Naseer & Rafique (2021) was implemented (0.9> α≥0.8). Lastly, the Academic Performance Scale, authored by Birchmeier et al. (2015), was also adopted for this study (0.9> α≥0.8).

Data Collection

The study utilized a four-step process for its data collection. The first step was to identify respondents using purposive non-probability sampling. Second, the study and its background and purpose were introduced to the respondents. Third, consent was requested from the respondents. Finally, data was gathered from the students using an online survey method.

In conducting the study, the researchers acknowledged the need for fairness, objectivity, security, and data storage. They also considered the participants' voluntary participation, the option to opt-out, confidentiality, anonymity, and transparency.

Data Analysis

Descriptive and inferential statistics were used to analyze and interpret the data. Medians were generated for learners' attitudes, students' level of efficacy in using the LMS design features, academic support received from parents and teachers, and BL effectiveness. The researchers then conducted a Spearman Rho Test to assess the correlation between independent and dependent variables. Finally, this study employed a Multiple Regression Analysis between the variables to identify the predictors of BL effectiveness.

Results and Discussion

Learner's Attitude

The overall result shows a positive learner's attitude (x=4) toward BL, which is consistent with the findings of the studies of Yu (2021), Mahasin et al. (2021), and Aladwan et al. (2018). These results also align with the studies' findings, in which the quality of learning improved (including student's time management, engagement in learning, and comprehension of the lessons) with positive learner's attitude towards BL.

Table 3.1. Learner's Attitudes Toward Blended Learning (n=202)

Statement	Median	Interpretation
Blended learning provides me with enough time to perform tasks.	4	Positive Attitude
Blended learning enables me to become more involved in the learning process.	4	Positive Attitude
Blended learning is more beneficial, combining online class learning with traditional in-class learning than using either method alone.	3	Positive Attitude
Blended learning sessions are more meaningful because, after face-to-face learning, they incorporate discussions in an online learning environment.	3	Positive Attitude
Learner's Attitude Total Median Score	4	Positive Attitude

Legend: 1 - 3, Negative Attitude; 3.1-5, Positive Attitude

Students' Level of Efficacy in Using the LMS Design Features

The survey results align with Kan et al.'s (2020) gauge of student satisfaction with using LMS. It aligns with Aliazas et al.'s (2021) and Afable et al.'s (2022) findings on students' familiarity with technology aids in using the LMS.

Table 3.2. Students' Level of Efficacy in Using the LMS Design Features (n=202)

Statement	Median	Interpretation
Tools		
Submitting work using the LMS is easy	4	High Efficacy
Viewing grades using the LMS is easy and appropriate to monitor my learning process.	4	High Efficacy
The tools of the LMS are easy to navigate on all devices.	4	High Efficacy
Participating in chats or discussions using the LMS is easy.	4	High Efficacy
Tools Total Median	4	High Efficacy
Resources		
The course resources could easily be accessed.	4	High Efficacy
External resource materials can easily be located.	4	High Efficacy
Resources Total Median	4	High Efficacy
Students' Level of Efficacy in Using the LMS Design Features Total Median Score	4	High Efficacy

Legend: 1 - 3, High Attitude; 3.1-5, High Attitude

Level of Academic Support Received from Parents

The high parental academic support aligns with the rest of this study's results as there is a reported positive link between parental academic support and BL effectiveness (as seen in section 4.6). Results are consistent with Afable et al. (2022), Choe's (2020), Lara et al. (2019) and Tolentino & Arcinas (2018) studies because they also reported a positive relationship between academic achievement and parental involvement. Tolentino & Arcinas (2018) study showed that as high levels of parental support results in better academic performance. Results differ from previous studies regarding the learning setup, as existing studies were not conducted in a blended earning environment.

Table 3.3. Level of Academic Support Being Received from Parents (n=202)

Statement	Median	Interpretation
Financial support		
My parents provide financial support for my academic needs	5	High Support
Regular communication		
Communication with my parents improve my learning performance	3	Moderate Support
Advice		
My parents advise me to improve my academic outputs	3	Moderate Support
Time		
My parents spend time checking my academic needs	3	Moderate Support
Academic Support Being Received from Parents Total Median Score	4	High Support

Legend: 1 - 1.66 for Low Support; 1.67 - 3.33 for Moderate Support; 3.34 - 5 for High Support

Level of Academic Support Received from Teachers

Findings are aligned with the rest of the study's results as respondents experienced a significant positive relationship with BL effectiveness regarding academic support from teachers. Teacher-to-learner interaction (see Table 3.4) was also highly effective among them. These results support the study of Naseer & Rafique (2021) as their study claims a positive association between online learning satisfaction and teacher support. Results also aligned with the study by Amadi et al. (2017), as students deem BL highly effective in academic performance. Results in this study only differ from previous literature regarding the respondent's learning setups, wherein previous studies were not conducted in a BL setup.

Table 3.4. Level of Academic Support Being Received from Teachers (n=202)

Statement	Median	Interpretation
Teacher's mastery of the subject		
The teachers' mastery of the subject improves my academic performance	4	High Support
Technical feedback received from teachers		
Teachers helping points for improvement me correct my mistakes	4	High Support
Student-teacher communication provides feedback and performance reports for both students and teachers.	4	High Support
Technical feedback received from teachers Total Median	4	High Support
Regular communication		
I am highly motivated to learn when I communicate with my teachers.	4	High Support
Teachers regularly communicate to inquire about my academic requirements	3	Moderate Support
Regular communication Total Median	4	High Support
Academic Support Being Received from Teachers Total Median Score	4	High Support

Legend: 1 - 1.66 for Low Support; 1.67 - 3.33 for Moderate Support; 3.34 - 5 for High Support

Blended Learning Effectiveness

Results are consistent with the entirety of the study. Four domains were covered: academic motivation learner to learner interaction, teacher to learner interaction and academic performance. Findings show that high academic motivation and interaction with peers and teachers do not result in students performing better in class discussions and accomplishing tasks early. The results are consistent with the study of Aladwan et al. (2018), as BL has a positive impact on academic performance. It also confirms the study of Kintu et al. (2017), which found that interactions between students and teachers significantly correlate with academic motivation. Finally, it is also concurrent with the study by Bouilheres et al. (2020); both studies agree that BL positively impacts student-to-teacher interaction. However, their study reported less interaction between students, while this study reported an increase.

Table 3.5. Respondents' Perceived Effectiveness of Blended Learning (n=202)

Statement	Median	Interpretation
Academic Motivation		
You experience fulfillment when broadening your knowledge about subjects that appeal to you.	4	High Effectiveness
You feel satisfied when you are in the process of accomplishing difficult academic activities.	4	High Effectiveness
You experience pleasure and satisfaction while learning new things in school.	4	High Effectiveness
Academic Motivation Total Median	4	High Effectiveness
Learner-to-learner interaction		
With this Blended learning approach, I interact more with other students inside and outside the classroom.	4	High Effectiveness
Teacher-to-learner interaction		
With this Blended learning approach, I interact more with my lecturers inside and outside the classroom.	4	High Effectiveness
Academic Performance		
I exert more effort when I do difficult assignments.	4	High Effectiveness
I pay attention and listen during every discussion	3	Moderate Effectiveness
I actively participate in every discussion	3	Moderate Effectiveness
I start papers and projects as soon as they are assigned	3	Moderate Effectiveness
Academic Performance Total Median	3	Moderate Effectiveness
Blended Learning Effectiveness Total Median Score	4	High Effectiveness

Legend: 1 - 1.66 for Low Effectiveness; 1.67 - 3.33 for Moderate Effectiveness; 3.34 - 5 for High Effectiveness

Association between the Independent Variables and Blended Learning Effectiveness

The results show that academic support received from teachers has the strongest significant positive relationship, which is concurrent with the study of Amadi et al. (2017). This study also supports the findings of Kintu et al. (2017), which revealed that learner attitudes toward BL were significant factors in learner satisfaction and motivation. However, results also show a significant and positive association between students' level of efficacy in using the LMS and BL effectiveness which contradicts the findings of Tus et al. (2021). Lastly, academic support received from parents has the weakest association, but it still has a significant and positive relationship. These findings support the study of Lara et al. (2019), in which it was reported that high parental involvement strongly enhances students' academic achievement.

Table 3.6. Association between the Independent Variables and Blended Learning Effectiveness

Independent Variables	Spearman's Rho	Interpretation
Academic Support Being Received from Teachers	0.515***	Significant Positive Strong Relationship
Learner's Attitude	0.483***	Significant Positive Strong Relationship

Independent Variables	Spearman's Rho	Interpretation
Students' Level of Efficacy in Using the LMS Design Features	0.340***	Significant Positive Moderate Relationship
Academic Support Being Received from Parents	0.284***	Significant Positive Weak Relationship

Legend for p-value: * p < .05, ** p < .01, *** p < .001
Legend for Spearman's Rho: 0.01-0.19 for No or negligible relationship; 0.20-0.29 for Weak relationship; 0.30-0.39 for Moderate relationship; 0.40-0.69 for Strong relationship; ≥0.70 for a very strong relationship

Predictors of Blended Learning Effectiveness

The findings show that the four independent variables examined are all significant, thus predictors or key factors to effective implementation of BL. Learner attitudes toward BL shows to be the strongest predictor of effective BL implementation, followed by strong academic support from the teachers. While found to be significant, academic support from, the parents and students' level of efficacy to use the LMS are the two weakest factors to effective BL implementation. These results back up the studies of Kintu et al. (2016), Naseer et al. (2021), Choe (2020), and Jaggars et al. (2016).

Effective BL implementation therefore needs to boost learners' positive attitude towards BL, strengthen academic support from both the teachers and parents, and enhancing students' skills on the use of the different features of the LMS.

Table 3.7. Predictors of Blended Learning Effectiveness

Predictor	Estimate	p	Interpretation
Learner's Attitude	0.691	< .001	Significant
Academic Support Being Received from Teachers	0.516	< .001	Significant
Academic Support Being Received from Parents	0.281	0.004	Significant
Students' Level of Efficacy in Using the LMS Design Features	0.217	0.007	Significant

Legend: If p < .05, the variable is a predictor

Conclusion

Blended learning is the prevalent mode of education in the country today; it can be enhanced by analyzing its effectiveness and predictors. The study revealed favorable attitudes toward BL, high self-efficacy of the students in using the LMS, and strong academic support from instructors and parents. The results also revealed that SHS students found BL an effective learning method.

The study found significant positive correlations between instructors' academic support for students and their perceptions of BL's effectiveness. The same significant positive correlation was found between learners' attitudes and their perceptions of BL's effectiveness. There was a moderately positive correlation between their LMS self-efficacy and the perceived effectiveness of BL. Parents' academic support was found to have a weak positive correlation with the perceived effectiveness of BL. Multiple regression analysis revealed that all the independent variables are predictors of the effective use of BL, with the learners' attitude being the strongest predictor, followed by their teacher's academic support. Parents' academic support and students' self-efficacy in using LMS emerged as weak predictors, requiring attention to engage more parents in their children's BL experience and to enhance the students' self-efficacy in the LMS. To maximize the full potential of BL, parents must actively participate in their children's learning experiences, and students must be able to fully navigate the

LMS's various features for a more meaningful engagement in BL.

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