Exploring College Students' Learning Space and Engagement in a Blended Learning Modality

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ABSTRACT

In education, changes in how students learn, especially with blended learning have made it harder for college teachers to keep students engaged. This descriptive-correlational study looked at how the learning space where students learn and how engaged they are affect their academic performance. The study involved 169 first year Education students at a private college in Cagayan de Oro City. Data were analyzed using descriptive statistics as well regression analysis. Data revealed that that the participants were provided with generally high quality of learning spaces in terms of social and technological space whether they are at home or in school but only moderate quality on physical environment at home. For student Engagement, participants were generally highly engaged in their classes in terms of cognitive, behavioral and affective whether they are at home or in school. As for the academic performance, the participants performed "Average" academically in a Blended-learning modality. The participants' learning space and the quality of their engagement significantly influence their academic performance with social learning space at school best predicts academic performance. Data revealed that a better learning spaces and engagement lead to higher grades, with each improvement increasing scores by 3.19 points. However, these factors explain only 14.4% of grade differences, indicating other influences. Recommendations include teachers adopting new methods, administrators enhancing spaces and providing workshops, and students offering feedback for improvement.

Keywords: *physical environment, social environment, technological environment, affective, behavioral, cognitive, learning space, student engagement, blended learning, academic performance.*

Introduction

A well-designed learning space is significant for creating an environment where learning transpires and develops. It serves as the cornerstone where education thrives, molding students' experiences and achievements. Learning space mainly involves three dimensions namely: physical, social and technological environment. In today's dynamic educational landscape, traditional modes of learning have given way to innovative approaches, propelled by advancements with the aid of physical, social and technological environments that completely reshape the education landscape. As technology keeps changing how we learn, the place where we learn becomes really important for teaching and learning.

Guillen (2022) found that having the appropriate physical setup for blended learning, which includes having the right technology and infrastructure, can improve students' academic performance. Similarly, Barrett et al. (2019) discovered that schools with better physical learning environments experienced improved student performance, leading to better academic outcomes. Meanwhile, social environments such as relationships with peers and teachers can create a rapport and community engagement, linked with successful learning outcomes and

improved academic performance. (Redmond et al., 2018; Chatterjee and Correia, 2020). As for the technological environment, D'Angelo (2018) found that technology positively influences the satisfaction of learners, endorses involvement, and facilitates achievements in academics.

Moreover, student engagement is one of the independent variables in this study that is assumed to influence the students' academic performance. Student engagement is a multidimensional concept that includes behavioral, emotional, and cognitive aspects of a student's connection to their learning environment (Carvalho & Veiga, 2023). Hirtz (2020) concluded in his study that academic performance will improve if teachers can better engage their students.

Thus, in the context of this blended learning modality, this study intended to determine if the dimensions of the learning space and engagement of students influence their academic performance. Hence, this study was conceptualized.

Theoretical and Conceptual Framework

This study assumed that the quality of the learning environment and students' engagement influenced their academic performance in blended learning. Drawing on Kurt Lewin's Field Theory for learning space and Albert Bandura's Social Cognitive Theory for engagement, the study explored three dimensions of learning space: physical, social, and technological environments and student engagement: affective, behavioral and cognitive.

According to Lewin, the physical environment significantly shapes behavior, supported by studies emphasizing factors like workstation design and temperature affecting learning outcomes. For instance, Ayyildiz and Gumus (2021) highlighted the impact of various environmental elements on students' online learning experiences, while Brink et al. (2020) posited the importance of factors like temperature, lighting, and noise levels in study environments.

Similarly, the social environment, highlighted by the role of teacher support, influences motivation and academic achievement. This is supported by Realyvásquez-Vargas et al. (2020), who investigated the impact of learning environment factors during the COVID-19 pandemic and found that factors like temperature, noise, and illumination affected academic performance. Additionally, Baafi (2020) demonstrated the influence of classroom temperature on students' academic performance.

Moreover, the technological environment, as seen in studies showing improved performance with technology integration, plays a crucial role. Berrocoso et al. (2022) showed that the integration of technologies resulted in enhanced academic performance, while Sampasa-Kanyinga et al. (2019) indicated that incorporating technology into the classroom was linked to positive student outcomes.

Bandura's Social Cognitive Theory underscores how learners' interactions with their environment affect their achievements. It encompasses affective, cognitive, and behavioral engagement, which influence academic success. Affective engagement involves emotional involvement, while cognitive engagement entails active participation in learning activities. Behavioral engagement refers to physical actions related to meeting academic demands.

This study aims to understand how these factors collectively impact students' academic performance in blended learning. It focuses on the dimensions of learning space and students' engagement, seeking to elucidate their interrelationship.
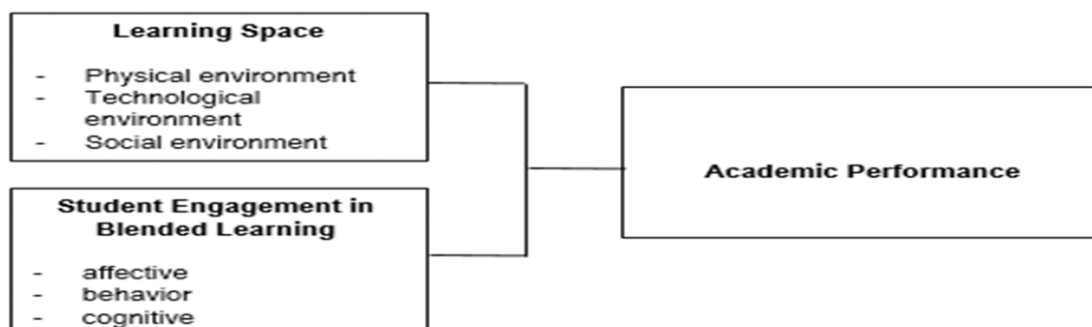

Figure 1. Schematic Presentation of the Study

Research and Methodology

This study utilized a descriptive-correlational research design to explore the relationship between learning space, student engagement, and academic performance in the Facilitating-Learning Centered Teaching course. Participants were first-year Education students in a private college in Cagayan de Oro City during the 2023-2024 academic year, with a total of 323 students involved. Simple random sampling was employed, resulting in 169 students participating in the study with the aid of Yamanes' Formula.

The data were gathered through the researcher made instruments which included questionnaires for assessing learning space (physical, social, and technological environments) and student engagement (behavioral, cognitive, and affective dimensions). The modified questionnaires went through content validation by experts in the field.

The results were statistically analyzed using Cronbach Alpha Coefficient to determine its values. From the reliability testing, it yielded the following alpha values: Physical Environment (home=0.79; school=0.78); Social Environment (home=0.81; school=0.83); and Technological Environment (home=0.80; school=0.78). Meanwhile, the items on Student engagement yielded the following alpha values: Cognitive engagement (home=0.78; school=0.77); Behavioral Engagement (home=0.78; school=0.78); and
Affective Engagement (home=0.79; school=0.79). According to Bentler (2021), the accepted range of alpha values for reliability testing spans from 0.70 to 0.95, indicating that the alpha values mentioned above fall within the accepted range.

Prior to administering the questionnaires via Google Form, the researchers obtained approval from the Research and Ethics Committee (REC) of the institution where the study was conducted. Participants were informed that their involvement was voluntary and that they had the right to decline participation. Informed consent was also obtained from participants, who were assured that their responses would not affect their academic performance and that all gathered information would be kept strictly confidential. Regarding academic performance data, the researchers adhered to protocols established by the Head Registrar.

The collected data underwent descriptive statistical analysis, including calculating standard deviation and examining mean distribution scores to understand students' self-regulated strategies and level of engagement in academic pursuits. Inferential statistics, such as multiple regression analysis, were employed to explore the relationship between self-regulated strategies, student engagement, and academic performance.

Results and Discussion

Participants' Assessment on their Learning Space

Table 1. Summary Table of the Participants' Learning Space

Learning Space	At Home	Interpretation	In school	Interpretation
Physical	3.43	Moderate Quality	3.80	High Quality
Social	4.05	High Quality	4.20	High Quality
Technological	3.76	High Quality	3.81	High Quality
Grand Mean	**3.75**	**High Quality**	**3.94**	**High Quality**

Table 1 presents the Summary Table of the Participants' Learning Space at home and in school. While the physical environment at home is rated as moderate, it is considered high quality in school. This suggests a need to enhance the physical learning space at home to match the standards of the school environment. However, both home and school environments excel in social and physical environments, indicating strengths that educators can leverage to enhance learning experiences. In a nutshell, the Learning Space that the

participants have experienced both at home and in school are of high quality as indicated by the grand mean of **3.75** and **3.94** respectively.

Participants' assessment of their Quality of Engagement

Table 2. Summary Table of the Participants' Quality of Engagement

Participants' Engagement	At Home	Interpretation	In School	Interpretation
Cognitive	4.00	High Quality of Engagement	4.02	High Quality of Engagement
Behavioral	4.06	High Quality of Engagement	4.05	High Quality of Engagement
Affective	4.04	High Quality of Engagement	4.09	High Quality of Engagement
Grand Mean	**4.03**	**High Quality of Engagement**	**4.06**	**High Quality of Engagement**

Table 2 provides a summary of Participants' Engagement. The data indicates a consistently *high level of engagement* across cognitive, behavioral, and affective domains. This suggests that students are actively involved and invested in their learning experiences, both within the home environment and in the school setting. The high level of engagement among students suggests an opportunity for educators to improve learning experiences. Recognizing and reinforcing positive engagement behaviors can create a supportive environment that fosters academic success and well-being. Identifying areas of strength and improvement can guide targeted interventions to enhance student engagement further. Overall, the participants were highly engaged in their course whether in school or at home as revealed in the grand mean of **4.03** and **4.06** respectively.

Participants' level of academic performance

Table 3. Descriptive Statistics of the Participants' Academic Performance

Percentage Score	Grade	Description	Frequency	Percentage
94.8 - 100	1.00	Outstanding	3	1.78
83.6 – 94.7	1.25 -1.50	Above Average	66	39.05
72.4 – 83.5	1.75 –2.00	Average	83	49.11
61.2 – 72.3	2.25 –2.50	Below Average	14	8.28
55.6 – 61.1	2.75	Fair	2	1.19
50.0 – 55.5	3.00	Passed	1	.59
		Total	**169**	**100.00**
		Overall Mean		**81.17**
		Interpretation		**Average**
		Standard Deviation		**7.33**

Table 3 provides insights into the participants' academic performance during Midterm. The data indicates an average performance with an overall mean grade of 81.17. It can be gleaned that 49.11percent of the participants achieved an Average performance (grades ranging from 1.75 to 2.00), while 39.05% attained an Above Average performance (grades ranging from 1.25 to 1.50), demonstrating substantial success among students. Despite the majority performing above average, a noticeable proportion (8.28%) fell into the "Below Average" category, indicating potential areas for improvement. Additionally, 1.19% received a Fair grade, while 0.59% obtained a Passed remark. Tanucan et al. (2023) highlighted interventions offering instructional guidance

and socio-emotional support as effective strategies for improving academic performance, reinforcing the importance of targeted interventions for struggling students.

Moreover, a small percentage (1.78%) achieved an "Outstanding" grade (1.00), showcasing exceptional academic capabilities within the group. The overall mean percentage score of 81.17 aligns with the "Average" interpretation category, supporting the consistency and reliability of the data. Furthermore, the standard deviation of 7.33 indicates minor variability in academic performance among participants, suggesting a relatively homogeneous group overall.

In conclusion, Table 9 suggests a generally consistent level of academic performance among participants, with the majority falling within the "Average" range. While there are indications of both exceptional and below-average performance, targeted support or enhancement efforts may benefit certain individuals within the group.

Regression Analysis of the Influence of the Participants' Learning Space and Engagement on their Academic Performance

Table 10 presents the regression analysis of the influence of the participants' learning space and engagement on their academic performance. Results reveal that the whole model is significant ($F = 2.19$, $p = .015$). Thus, the null hypothesis is rejected. This implies that the combination of factors such as learning space and the quality of engagement have a statistically significant relationship with academic performance.

Table 4. Regression Analysis of the Influence of the Participants' Learning Space and Engagement on their Academic Performance

Participants' Learning Space and Engagement	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	71.21	4.19		17.00	.000
Physical Learning Space (Home)	-.412	1.33	-.043	-.310	.757
Physical Learning Space (School)	-.438	1.34	-.039	-.327	.744
Social Learning Space (Home)	-1.67	1.41	-.146	-1.18	.240
Social Learning Space (School)	3.19	1.45	.278	2.21*	.029
Technological Learning Space (Home)	2.62	1.72	.232	1.53	.129
Technological Learning Space (School)	.216	1.50	.019	.144	.886
Cognitive Engagement (Home)	2.77	2.12	.237	1.31	.193
Cognitive Engagement (School)	-1.80	1.98	-.155	-.911	.364
Behavioral Engagement (Home)	.243	1.84	.021	.132	.895
Behavioral Engagement (School)	-5.19	2.24	-.440	-2.32*	.022
Affective Engagement (Home)	.588	2.19	.048	.268	.789
Affective Engagement (School)	2.34	1.75	.204	1.34	.183

Model Summary

$R = .380$ $R2 = .144$ Adjusted $R2 = .078$ $F = 2.19*$ $p = .015$

Table 10 presents regression analysis results showing the significant relationship between participants' learning space, engagement, and academic performance (F = 2.19, p = .015). While the model is statistically significant, it only explains 14.4% of academic performance variance, suggesting other factors like Learning Preferences and Styles, Health and Well-being, and Previous Academic Achievement may play a role. Learning Preferences and Styles are important as tailored instruction can enhance learning, supported by Cabugnason and Linaugo (2023). Health and Well-being are crucial as students facing challenges may struggle academically, as noted by Embalsado et al. (2023). Previous Academic Achievement also matters, with Corpuz et al. (2022) finding that past performance can predict future success.

The analysis of independent variable dimensions at home and in school reveals that social learning space at school significantly influences academic performance, aligning with Lam (2018) findings. This highlights the importance of fostering supportive social environments in schools to enhance academic outcomes. Conversely, a high coefficient of behavioral engagement at school (-5.19) suggests a significant negative impact on academic performance, affirmed by (Vertudez, (2023) study. Educators should address distractions and disruptions to create a focused learning environment. While other factors like physical and technological learning spaces show non-significant coefficients, they still play vital roles in learning. Further research is needed to explore additional factors influencing academic performance and develop strategies for improvement.

Summary, Conclusion and Recommendations

The following were revealed after the data were collected and analyzed:
1. The participants were provided with generally high quality of learning spaces in terms of social and technological space whether they are at home or in school but only moderate quality on physical environment at home.
2. The participants were generally highly engaged in their classes in terms of cognitive, behavioral and affective whether they are at home or in school.
3. The participants generally performed on average level academically in a Blended learning modality.
4. The participants' learning space and the quality of their engagement significantly influence their academic performance with social learning space at school best predicts academic performance

Based on the findings, the assumption advanced in this study has been confirmed that the better learning space the student experienced and the more highly engaged they were, their academic performance improved. This study found evidence to support Bandura's (1986) social cognitive theory, which postulated that the students' learning environment contributed to their engagement and achievement and therefore, was significant in the learning process of the students. Thus, creating supportive learning environments at home and school, and maintaining such supportive environments was essential for sustaining student engagement and motivation quality, crucial for enhancing student engagement and academic success in a Blended Learning Modality. This was supported by Parmanand (2019) that a supportive environment boosts motivation, engagement, and well-being, leading to better learning experiences for students.

On the basis of the findings, the following recommendations are hereby presented; that:
1. Teachers and educators may utilize innovative teaching methods that leverage the physical, social, and technological environment to foster a positive and supportive learning atmosphere.
2. School administrators may consider integrating standards for learning space design into educational policies to ensure optimal conditions for learning. In addition, they may organize workshops for teachers to enhance their abilities in creating effective learning spaces and promoting student engagement in Blended Learning environments.
3. College students may advocate for improvements in learning spaces by providing feedback to educators and administrators on what they found conducive to their learning experience.
4. Future researchers may explore other factors that may have influenced student performance beyond learning space and engagement.

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