Student Evaluation of Blended Learning Implementation and Faculty Performance with Online Components: A Comparative Analysis Across Senior High School Grade Levels and Academic Strands

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Abstract

Blended learning, which combines face-to-face instruction with online learning components, has become increasingly prevalent in Philippine senior high schools. This study examines student evaluations of blended learning implementation, with a specific focus on the effectiveness of its online components. Additionally, it explores faculty performance in delivering these online aspects across various grade levels and academic strands in a Philippine senior high school. Using a mixed-methods approach, this study surveyed 1,450 students from various academic strands (STEM, ABM, HUMSS, and GAS) in Grades 11 and 12. Quantitative data were analyzed using t-tests, Mann-Whitney U tests, and Kruskal-Wallis tests, while qualitative data underwent constant comparative analysis. Results showed no significant differences between grade levels but revealed variations across academic strands. STEM students reported more positive evaluations of online learning implementation, while GAS students viewed faculty performance most favorably. Common challenges identified by the students included excessive workload, unstable internet connections, and mental health concerns. Opportunities focused on better time management, diverse learning tools, and independent learning. These findings underscore the need for strand-specific customization in blended learning implementation and targeted faculty development. The study contributes to research on blended learning in secondary education and offers insights for enhancing technology-enhanced learning in diverse academic contexts.

***Keywords**: online learning, blended learning, evaluation, senior high school, academic strands*

Introduction

The integration of learning technology in Philippine senior high school education has witnessed significant growth in recent years, particularly in response

to global educational trends and the challenges posed by the COVID-19 pandemic (Toquero, 2020). The Department of Education's implementation of the K-12 curriculum in 2013 set the stage for increased technology adoption, emphasizing 21st-century skills and digital literacy (Almerino et al., 2020). However, the rapid shift to online and blended learning modalities in 2020 accelerated this process, prompting schools to leverage various digital platforms and tools to ensure educational continuity (Joaquin et al., 2020). Despite these advancements, the effectiveness of technology integration and its impact on student learning outcomes remain subjects of ongoing research and debate (Rabacal et al., 2022). Furthermore, the diverse socioeconomic landscape of the Philippines presents unique challenges in ensuring equitable access to learning technologies across different regions and demographics (Bongco & David, 2020). As such, understanding the context of learning technology in Philippine senior high schools is crucial for informing policy decisions and improving educational practices in the digital age.

As a technological approach, blended learning has emerged as a promising pedagogical strategy in Philippine senior high schools, combining the benefits of traditional face-to-face instruction with online learning components (Bouilheres et al., 2020). This approach leverages various digital tools and platforms to create a flexible, student-centered learning environment that can adapt to diverse educational needs and contexts (Mercado, 2021). In the Philippine setting, blended learning has been particularly relevant in addressing challenges such as large class sizes, limited physical resources, and geographical barriers to education access (Oducado & Estoque, 2021). The implementation of blended learning models has facilitated the integration of multimedia resources, interactive simulations, and collaborative online spaces, enhanced engagement, and promoted active learning among senior high school students (Dumlao & Mengorio, 2019). Moreover, this technological approach has shown potential in developing students' digital literacy and self-directed learning skills, which are crucial for their future academic and professional success (Baluyos et al., 2023). However, the effective implementation of blended learning in Philippine senior high schools requires careful consideration of factors such as technological infrastructure, teacher training, and student readiness for technology-enhanced learning environments. This study specifically focuses on the online components within a blended learning model, recognizing how they interact with and complement traditional classroom instruction.

Objectives

Given the rapid adoption of blended learning in Philippine senior high schools, this study aims to address three key research questions:

1. To what extent do evaluations of blended learning implementation, specifically its online components, and faculty performance in these online aspects differ between Grade 11 and Grade 12 students?
2. How do evaluations of the online components of blended learning implementation and faculty performance in these online aspects vary among students from different academic strands (STEM, ABM, HUMSS, GAS)?

3. What key suggestions do students across grade levels and academic strands offer for improving the quality of the online components in the blended learning model?

While the study examines the online aspects, it is crucial to remember that these exist within the broader context of a blended learning environment. These questions seek to uncover the nuanced experiences of students in technology-enhanced learning environments, considering both grade level and academic specialization as potential factors influencing their perceptions and needs (Tamayao et al., 2020).

Literature Review

The implementation of blended learning in secondary education has gained significant traction globally, particularly in response to the challenges posed by the COVID-19 pandemic. Recent research in the Philippine context has explored various aspects of blended and online learning in senior high schools, revealing a complex landscape of opportunities and challenges. Poirier et al. (2019) conducted a systematic review of blended learning in K-12 education globally during non-emergency contexts. Their study indicated that blended learning approaches generally yield better learning outcomes compared to traditional face-to-face instruction in K-12. In the Philippines, Alibuyog et al. (2022) examined the effectiveness of a blended learning approach in teaching senior high school science during the transition period following the COVID-19 pandemic. Their study showed improved student performance and increased motivation in blended learning environments, particularly when incorporating interactive online simulations and collaborative activities. Moreover, well-designed blended learning experiences have been found to significantly enhance students' critical thinking skills, especially when leveraging online discussion forums and problem-solving activities in the Philippines during the post-pandemic period Orlanda-Ventayen (2023).

Studies on Filipino senior high school students' perceptions of online learning reveal mixed attitudes. While students appreciate the flexibility of online learning, they express concerns about internet connectivity issues and the lack of face-to-face interactions (Tadeo & Bacuyag, 2023). Rabacal et al. (2022) examined the implementation of project-based learning to develop 21st-century skills in Philippine senior high schools during the COVID-19 pandemic. Their study focused on fully online learning as an emergency response to school closures, providing insights into how digital tools can be leveraged for skill development in a remote setting. Their study found that students had positive perceptions of technology-enhanced learning activities, particularly those that promoted collaboration and critical thinking. However, Joaquin et al. (2020) investigated the rapid shift to fully online learning in Philippine higher education institutions as an emergency response to the COVID-19 pandemic. Their study highlighted the challenges of this abrupt transition from traditional face-to-face instruction to a completely online format. It also revealed variations in student experiences and preferences across different educational levels, emphasizing the need for tailored approaches to effectively implement online learning.

The transition to online and blended learning has had a significant impact on faculty roles. Toquero (2021) examined emergency remote education in Philippine higher education during the COVID-19 pandemic, finding that educators with adequate training and support performed better in fully online teaching. In a similar emergency context, Alvarez (2021) studied distance learning in Philippine universities, revealing a strong correlation between teachers' technological pedagogical content knowledge (TPACK) and their effectiveness in online instruction. Shifting to a post-pandemic setting, Mercado and Ibarra (2022) investigated blended learning in Philippine higher education institutions during the transition to the 'new normal'. They emphasized the importance of institutional support, including access to digital resources and collaborative planning opportunities, in enhancing faculty effectiveness in blended teaching environments.

The implementation of academic tracks in Philippine senior high schools has added another layer of complexity to the blended learning landscape. Studies have found variations in blended learning readiness across different academic strands. Tamayao et al. (2020) developed and validated a Blended Learning Readiness Scale for Filipino senior high school students during the transition to the 'new normal' in education. Their study, conducted in the context of the COVID-19 pandemic, found that STEM students generally demonstrated higher technological proficiency in blended learning environments. Guba et al. (2023) examined the effectiveness of online learning tools in developing financial literacy skills among senior high school students in the Accountancy, Business, and Management (ABM) strand in the Philippines. Their study, conducted in a post-pandemic context, highlighted the potential of specialized digital platforms in enhancing strand-specific competencies in a blended learning setup. Palaoag et al. (2021) investigated the online learning experiences of Humanities and Social Sciences (HUMSS) students during the COVID-19 pandemic, focusing on fully online learning as an emergency measure. They emphasized the importance of developing strand-specific online learning strategies to address unique challenges faced by HUMSS students in this context.

Grade-level differences in students' perceptions and readiness for online learning have also been observed. Alipio (2020) examined e-learning readiness among Filipino learners during the early stages of the COVID-19 pandemic, finding that Grade 12 students generally demonstrated higher levels of self-directed learning and technology self-efficacy compared to Grade 11 students in a fully online learning environment. Dangle et al. (2022) compared Grade 11 and Grade 12 students' perceptions of blended learning in Philippine public senior high schools during the transition back to face-to-face classes. They found that Grade 12 students showed more positive perceptions of blended learning, particularly in terms of its flexibility and potential for personalized learning. Rabacal and Alegato (2021) studied online learning engagement and academic performance of Grade 11 and Grade 12 students in the Philippines during the COVID-19 pandemic. They reported higher levels of motivation and self-regulation in fully online learning environments among Grade 12 students compared to Grade 11 students.

The studies reviewed span a variety of contexts in Philippine education,

primarily focusing on the shift to online learning during the COVID-19 pandemic. While most of these studies center on fully online learning implemented as an emergency measure, our study contributes to this body of literature by investigating student evaluations of the online components within a blended learning model as schools transition to post-pandemic educational approaches. Notably, there is a lack of comprehensive research examining the interplay between grade levels, academic strands, and student evaluations of both blended learning implementation and faculty performance. This study addresses this gap by providing an integrated analysis of these factors, offering insights that can help inform targeted strategies for enhancing technology-enhanced learning in Philippine secondary education.

Theoretical Framework

With the use of an integrated theoretical framework, this study investigates the intricate interactions among variables that impact senior high school students' perceptions, evaluations, and experiences in online blended learning environments in the Philippines. At its core, the Technology Acceptance Model (Davis, 1989) elucidates how perceived usefulness and ease of use shape students' attitudes towards blended learning technologies, while the Community of Inquiry framework (Garrison et al., 2000) offers insights for assessing the quality of online learning experiences, focusing on teaching, social, and cognitive presences. These are complemented by the Self-Regulated Learning theory (Zimmerman, 2000), which provides a lens to understand students' ability to manage their learning in blended environments, and the Cognitive Load Theory (Sweller, 1988), which helps elucidate the mental effort associated with learning tasks in such environments.

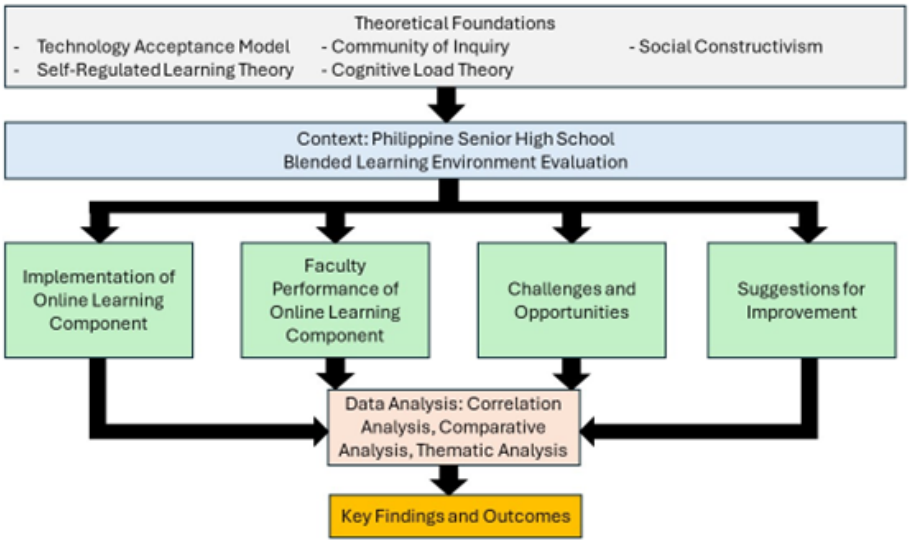
Vygotsky's (1978) Social Constructivism underpins the role of social interaction in cognitive development within blended learning settings. By integrating these diverse theoretical perspectives, applied separately, this study aims to provide a holistic understanding of the blended learning experience in senior high schools. This comprehensive theoretical lens enables an examination of how technological acceptance, online learning quality, self-regulation, cognitive load, and social interaction collectively shape students' perceptions and experiences across different grade levels and academic strands. Through this approach, the study seeks to offer nuanced insights that can inform both theory and practice in the rapidly evolving landscape of blended learning in Philippine secondary education.

Conceptual Framework

Figure 1 presents the conceptual framework guiding this study on the evaluation of blended learning in a senior high school. The framework illustrates how the theories inform the study's context and shape the evaluation process. The Technology Acceptance Model (Davis, 1989) and Community of Inquiry (Garrison et al., 2000) provide insights into students' attitudes towards online learning technologies and the quality of their online learning experiences. The Self-Regulated Learning Theory (Zimmerman, 2000) informs the assessment of students' ability to manage their learning in blended environments, while the

Cognitive Load Theory (Sweller, 1988) helps in understanding the mental effort associated with online learning tasks. Social Constructivism (Vygotsky, 1978) underpins the examination of social interaction's role in the blended learning context. Within this theoretical framework, the study evaluates four key areas: (1) implementation of the online learning component, (2) faculty performance in online teaching, (3) challenges and opportunities faced by students, and (4) suggestions for improvement.

Figure 1
Conceptual Framework



These areas are examined across different grade levels (11 and 12) and academic strands (STEM, ABM, HUMSS, GAS), reflecting the diverse student population of the senior high school. The data collected from these evaluations are subjected to rigorous analysis, including correlation analysis to explore relationships between variables, comparative analysis to identify differences across grade levels and academic strands, and thematic analysis to uncover patterns in qualitative data. This comprehensive analytical approach leads to key findings and outcomes, providing valuable insights into the effectiveness of blended learning implementation in Philippine senior high schools and offering actionable recommendations for improving this educational model in the future.

Methodology

This study employed a mixed methods approach to investigate student evaluations of blended learning implementation and faculty performance in the online learning component of the blended learning model across different grade levels and academic strands. By combining both quantitative and qualitative methodologies, the research provides a comprehensive understanding of the subject matter. The quantitative component utilized a cross-sectional survey design, allowing for the collection of a large amount of data at a single point in time and enabling comparisons between different groups. The qualitative

component incorporated an open-ended question within the survey, allowing students to provide suggestions for improving the quality of the online components of blended learning which provide rich, descriptive data to complement the quantitative findings.

The study targeted senior high school students from a private school in the Philippines. This specific group was chosen for several reasons. First, the selected school has been implementing a comprehensive blended learning approach since 2020, making it an ideal setting to examine student evaluations of this learning model. Second, as a private institution, the school possesses the resources and infrastructure to rapidly adapt to blended learning, allowing for a more established and consistent implementation compared to many public schools.

The school's blended learning approach aligns with the Department of Education's definition, emphasizing a learner-centered approach that enhances the educational experience by providing a flexible and adaptive learning environment. The model combines face-to-face and online learning modalities, with 40% or less of class time dedicated to online activities and 60% or more focused on face-to-face interactions.

The blended learning environment experienced by the participants integrates three main components: (1) In-person classroom activities form the core of the learning experience, featuring class discussions, group engagements, and interactive exercises. These face-to-face sessions promote active learning and develop students' communication skills. (2) Online content delivery through a learning management system provides bite-sized learning materials, including recorded lectures, assigned readings, and interactive exercises. This component supports self-paced learning and reinforces understanding of complex concepts. (3) Structured independent learning emphasizes self-directed study through online modules, research assignments, virtual classrooms, and discussion forums. This aspect encourages students to take ownership of their learning, set goals, and manage their time effectively.

The school uses a robust learning management system to deliver online learning materials and activities. This user-friendly interface supports various multimedia formats, includes assessment features, and is mobile-friendly, making learning more accessible and convenient for students.

By selecting participants from this context, the study aimed to gain insights into student evaluations of a well-established and comprehensively implemented blended learning model. The private school setting also allowed for a more controlled environment to examine the effectiveness of blended learning implementation across different grade levels and academic strands.

This participant group offers valuable perspectives on blended learning in a setting where technological infrastructure and pedagogical approaches have been systematically integrated. Their experiences provide a unique window into the potential of blended learning when implemented with sufficient resources and institutional support, offering insights that could inform best practices for

broader implementation in diverse educational settings.

The study targeted senior high school students from a private school in the Philippines, employing a combination of stratified and convenience sampling. The student population (N = 2,947) was stratified by grade level (11 and 12) and academic strands (STEM, ABM, HUMSS, GAS). Within each stratum, students were invited to participate voluntarily, subject to informed consent (and parental consent for minors). The final sample consisted of 1,450 students (49.5% of the population), with representation across all grade levels and academic strands.

Data were collected through an online survey administered using a secure web-based platform. The study was conducted during the third quarter of the 2023-2024 academic year, with participants of varying levels of exposure to the school's blended learning approach. Grade 11 students, all new to the school, had been engaged in the blended learning model for approximately one semester (half an academic year). In contrast, Grade 12 students had experienced the model since their Grade 11 year, resulting in about three semesters (one and a half academic years) of exposure.

This study focused specifically on students' evaluations of their blended learning experiences during the current academic year (2023-2024), specifically considering both the previous semester and the ongoing quarter at the time of data collection. This timeframe was chosen to capture students' most recent and relevant experiences with the blended learning model, ensuring that the data reflected the most up-to-date version of the blended learning approach, which had undergone refinements based on feedback and experiences from previous years. Additionally, this time frame allowed for a comparative analysis between students with different levels of exposure to the model. To ensure ethical standards were met, participants were provided with informed consent forms, and the data collection process adhered to ethical guidelines as approved by the school administration.

The survey instrument was developed based on a review of existing literature on blended learning and online education in secondary schools (e.g. Rasheed et al., 2020, Poirier et al., 2019). The survey instrument consisted of two main scales: an 11-item scale measuring student evaluations of blended learning implementation and a 14-item scale assessing faculty performance in online components of blended learning. Both scales utilized a 4-point Likert format. The initial item pool was reviewed by a panel of three experts including a dean of teacher education with a doctorate in education, a graduate school director with a doctorate in education, and a professor with a doctorate in curriculum and instruction. This expert review ensured content validity and alignment with current research in the field.

The instrument was then pilot-tested with a sample of 40 students, comprising five representatives each from the ABM, HUMSS, STEM, and GAS strands for both Grade 11 and Grade 12. Reliability analysis using Cronbach's alpha yielded coefficients of 0.861 for the blended learning implementation scale (M = 2.80, SD = 0.443) and 0.908 for the faculty performance scale (M = 3.14, SD = 0.375), indicating high internal consistency for both scales.

Exploratory factor analysis (EFA) was conducted using the maximum likelihood extraction method with promax rotation. The EFA revealed a single-factor structure explaining 36.2% of the variance. Factor loadings ranged from 0.358 to 0.778, with most items loading above 0.5, supporting the construct validity of the instrument. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity ($X^2(300) = 750$, $p < .001$) indicated that the data were suitable for factor analysis.

Model fit indices (RMSEA = 0.131, 90% CI [0.114, 0.156]; TLI = 0.506; BIC = -544) suggested that while the single-factor model provided a reasonable fit, there may be room for further refinement in future iterations of the instrument. Based on these results, minor revisions were made to improve item wording and scale performance. This rigorous development and validation process ensured that the final instrument was both reliable and valid for assessing student perceptions in the context of this study.

Data analysis involved both quantitative and qualitative techniques. The study employed both parametric and non-parametric statistical tests to ensure robust analysis of the data. Parametric tests (independent t-tests) were used to compare perceptions between Grade 11 and Grade 12 students when the data met assumptions of normality and homogeneity of variance. However, for comparisons across academic strands, non-parametric tests (Kruskal-Wallis) were employed due to unequal group sizes and potential violations of parametric assumptions. This mixed approach allows for appropriate analysis based on the specific characteristics of different subsets of the data.

Descriptive statistics were used to summarize demographic information and overall evaluations. Independent t-tests were employed to compare evaluations between Grade 11 and Grade 12 students, while the Kruskal Wallis test was used to examine differences across academic strands. Categorical frequency analysis was conducted to identify and rank the top three challenges and opportunities across grade levels and academic strands, with percentages calculated for between-group comparisons. Qualitative data from open-ended survey responses (N = 914) were analyzed using a constant comparative method, adapted from Boeije (2002). This iterative process began with the transcription and initial coding of survey responses. Codes were then systematically compared to identify emerging patterns and themes. Similar codes were grouped into broader categories, which were subsequently refined to develop overarching themes that captured the essence of student perspectives. This methodical approach allowed for a comprehensive analysis of qualitative data, maintaining the context and nuance of individual responses while identifying key themes in students' suggestions for improving online learning quality.

The constant comparative method proved particularly effective in synthesizing the diverse range of student feedback, providing rich insights that complemented the quantitative findings of the study. Categorical frequencies were quantified, and presented as percentages, both overall and by grade level and academic strand. Finally, theoretical insights were developed from the patterns observed.

Results and Discussion

This study examined blended learning implementation and faculty performance in online components of blended learning at a private senior high school in the Philippines. Findings revealed moderate to positive student evaluations across both blended learning implementation and faculty performance measures. Analysis of the implementation scale (Table 1) showed highest agreement for subject resource relevance (M = 3.22, SD = 0.538) and Canvas feature use (M = 3.07, SD = 0.589). Lower agreement was found for online mode suiting learning preferences (M = 2.62, SD = 0.758) and overall satisfaction (M = 2.66, SD = 0.717). Analysis of student evaluations revealed a notable pattern in the implementation of online components. While students strongly valued the relevance of subject resources and the learning management system's functionality, they expressed less enthusiasm about the alignment between online delivery modes and their personal learning preferences. This disparity suggests a potential mismatch between the technical infrastructure provided and students' learning needs. The moderate overall satisfaction scores further reinforce the need to bridge this gap between resource provision and learning preferences. This aligns with Almaiah et al. (2020), who emphasized tailoring e-learning systems to student needs. Rahiem (2020) also highlighted the importance of personalization in online learning environments.

Table 1
Students' Level of Agreement on the Implementation of Online Classes in the Blended Learning Model

	Mean	Median	SD
1. I find the school's online scheme strategic and convenient.	2.94	3	0.589
2. The online mode suits my learning preference and learning style.	2.62	3	0.758
3. All course requirements (learning modules, study guides, graded activities) are available online.	2.87	3	0.719
4. The course readings and other learning reources are relevant and useful.	3.22	3	0.538
5. The course requirements are reasonable/ doable (i.e., can be accomplished within the given time frame).	2.79	3	0.675
6. The different features of Canvas are used to provide varioous learning experiences.	3.07	3	0.589
7. The modules are well-planned, clear, and cohesive.	3.07	3	0.577
8. I am comfortable communicating online with my teachers.	2.80	3	0.725
9. I can discuss and collaborate on the activities with my classmates.	2.70	3	0.716

	Mean	Median	SD
10. I can discuss and collaborate on the activities with my classmates through Canvas.	3.01	3	0.649
11. I am satisfied with the overall implementation of online classes.	2.66	3	0.717

Note. N = 1450, Responses were measured on a 4-point Likert scale (1 = Strongly Disagree, 4 = Strongly Agree)

These results indicate a need for a more personalized approach to online components within the blended framework, potentially improving overall satisfaction and addressing diverse learning preferences.

Results from the students' evaluation of faculty performance in online components of blended learning (Table 2) showed generally positive evaluations, with most items receiving mean scores above 3.00.

The highest agreement was for teachers' accommodation of questions and feedback (M = 3.30, SD = 0.584) and use of criteria/rubrics (M = 3.28, SD = 0.565). Lower agreement was found for teachers having an exact schedule of activities (M = 2.99, SD = 0.658). Faculty performance evaluation revealed strengths in interactive and assessment aspects of online teaching. Teachers demonstrated particular effectiveness in fostering two-way communication and maintaining transparent evaluation criteria. However, the relatively lower scores in scheduling and activity organization point to potential areas for improvement in course structure and time management. These findings align with Rapanta et al.'s (2020) emphasis on clear communication in online environments, while highlighting specific areas where faculty development might enhance the online learning experience.

Table 2
Students' Level of Agreement on the Faculty Performance of Online Classes in the Blended Learning Model

	Mean	Median	SD
1. My teachers explained the modules, course requirements, and learning expectations early.	3.26	3	0.549
2. My teachers exhibit an encouraging/ positive tone during activities.	3.18	3	0.566
3. My teachers show expertise/mastery of the subject matter.	3.24	3	0.563
4. My teachers encourage both asynchronous and synchronous communication.	3.23	3	0.56
5. My teachers are considerate even during situations that disrupt learning.	3.27	3	0.63
6. My teachers accommodate questions, clarifications, consultations, and feedback.	3.3	3	0.584

	Mean	Median	SD
7. My teachers clearly explain how I will be graded.	3.23	3	0.579
8. My teachers use criteria/rubrics and provide qualitative comments on my performance.	3.28	3	0.565
9. My teachers use different types of learning resources/instructional materials.	3.19	3	0.532
10. My teachers provide graded tasks that challenge me to create/apply concepts.	3.27	3	0.533
11. My teachers give timely feedback to my questions or clarifications.	3.1	3	0.588
12. My teachers have an exact schedule of activities (e.g., video conference, chat).	2.99	3	0.658
13. My teachers allow ample time for me to think and contribute during discussions.	3.05	3	0.598
14. My teachers' performance is satisfactory.	3.23	3	0.518

Note. N = 1450, Responses were measured on a 4-point Likert scale (1 = Strongly Disagree, 4 = Strongly Agree)

While faculty performance was well-received, moderate overall satisfaction levels indicate room for improvement. This echoes findings by Coman et al. (2020), who identified similar challenges in the rapid transition to online learning during the COVID-19 pandemic. Adedoyin and Soykan (2020) suggest addressing technological challenges, enhancing engagement, and providing additional support to refine blended learning approaches.

The findings regarding implementation reveal a complex interplay between technological acceptance and cognitive load, as explained through the study's theoretical framework. The higher ratings for course resource relevance (M = 3.22) and Canvas feature use (M = 3.07) align with Davis's (1989) Technology Acceptance Model (TAM) in terms of perceived usefulness. However, the lower satisfaction with online mode suitability (M = 2.62) suggests that perceived ease of use - another key TAM component - may be compromised by excessive cognitive load, as theorized by Sweller (1988). When viewed through Sweller's Cognitive Load Theory, these ratings suggest that students may be experiencing high extraneous cognitive load from the online delivery method itself, potentially interfering with the germane cognitive load necessary for actual learning.

Moreover, the findings connect to Garrison's Community of Inquiry framework, particularly regarding teaching presence. The high ratings for teacher accommodation of questions (M = 3.30) demonstrate strong teaching presence, yet the lower scores for activity scheduling (M = 2.99) suggest gaps in the structural component of teaching presence. This disconnect in teaching presence may indicate that while teachers excel in direct interaction with students, the structural elements of the online learning environment may not be optimally designed to support cognitive presence and social presence, two other critical components of the Community of Inquiry model. The moderate overall satisfaction scores (M = 2.66) further reinforce this interpretation, suggesting

that while individual components of the blended learning environment show strengths, the integration of these components may need refinement to better support the full spectrum of presence types described in the Community of Inquiry framework.

To examine potential differences between grade levels in evaluations of online components of blended learning, independent sample t-tests were conducted for both implementation and faculty performance. For the implementation of online components, no significant difference was found between Grade 11 ($M = 2.88$, $SD = 0.42$) and Grade 12 ($M = 2.90$, $SD = 0.41$) students; $t(1448) = -1.11$, $p = 0.269$, $d = -0.058$, 95% CI [-0.0696, 0.0194]. Similarly, for faculty performance in online component of blended learning, there was no significant difference between Grade 11 ($M = 3.15$, $SD = 0.42$) and Grade 12 ($M = 3.14$, $SD = 0.42$) students; $t(1448) = 0.217$, $p = 0.828$, $d = 0.011$, 95% CI [-0.0388, 0.0485]. The absence of significant differences warrants examination through multiple theoretical lenses. From a social constructivist perspective (Vygotsky, 1978), this finding suggests that despite different lengths of exposure to the blended learning environment, both grade levels have achieved similar levels of adaptation to the social learning context.

This similarity can be understood through Zimmerman's (2000) Self-Regulated Learning theory. AlthoughWhile Grade 12 students have had longer exposure to the blended learning environment, Grade 11 students may have developed comparable self-regulation strategies through their previous educational experiences, particularly given their exposure to emergency remote learning during the pandemic years. The findings challenge the initial expectation that greater experience with blended learning would lead to significantly different evaluations. This unexpected result might be explained by the Technology Acceptance Model's emphasis on perceived usefulness and ease of use—factors that appear to stabilize relatively quickly in the blended learning environment, rather than showing continuous improvement with extended exposure.

The Welch's t-test, which does not assume equal variances, yielded similar results for both implementation ($t(1188) = -1.12$, $p = 0.263$) and faculty performance ($t(1168) = 0.219$, $p = 0.827$). These findings suggest that students' evaluations of online components of the blended learning implementation and faculty performance in the blended learning model do not significantly differ between the two grade levels. The small effect sizes (Cohen's d) further support the practical insignificance of the observed differences.

The consistent evaluations across grade levels suggest a stable blended learning environment, aligning with Bouilheres et al.'s (2020) emphasis on well-structured approaches enhancing student learning experiences.

Differences in evaluations across academic strands were examined using Kruskal-Wallis tests for both online learning implementation and faculty performance. Table 3 presents the results of these analyses, including pairwise comparisons. Significant differences were found across academic strands for both online learning implementation ($X^2(3) = 28.3$, $p < .001$, $\varepsilon^2 = 0.0195$) and faculty performance ($X^2(3) = 21.1$, $p < .001$, $\varepsilon^2 = 0.0145$). The effect sizes (ε^2)

indicate small but meaningful differences across strands for both variables.

For the online component of blended learning implementation, pairwise comparisons revealed that STEM students had significantly more positive evaluations than HUMSS students (W = 5.757, p < .001). ABM students reported significantly lower evaluations compared to both GAS (W = -4.373, p = .011) and HUMSS (W = -6.515, p < .001) strands. These findings suggest that STEM students may be more adept at or satisfied with the online learning components of the blended model, while ABM students may face more challenges or have less positive experiences.

Table 3

Kruskal-Wallis Test Results and Pairwise Comparisons for Evaluations Across Academic Strand

Variable	X	df	p	32	Pairwise Comparisons	W	p
Online Learning Implementation	28.3	3	< .001	0.0195	ABM vs HUMSS	-6.515	< .001***
					ABM vs GAS	-4.373	.011*
					ABM vs STEM	-2.215	.398
					GAS vs HUMSS	-0.0638	.969
					GAS vs STEM	3.487	.065
					HUMSS vs STEM	5.757	< .001***
Faculty Performance	21.1	3	<.001	0.0145	ABM vs GAS	-5.43	< .001***
					ABM vs HUMSS	-4.99	.002**
					ABM vs STEM	-2.55	.272
					GAS vs HUMSS	1.52	.706
					GAS vs STEM	4.15	.018*

Note. *p < .05, ** p < .01, *** p < .001

Regarding faculty performance, GAS students demonstrated significantly more favorable views compared to both ABM (W = -5.43, p < .001) and STEM (W = 4.15, p = .018) strands. Additionally, HUMSS students rated faculty performance significantly higher than ABM students (W = -4.99, p = .002). These results indicate that evaluations of faculty effectiveness in online teaching vary across academic strands, with GAS students being the most satisfied and ABM students the least satisfied.

The significant differences reveal distinct patterns in how different academic programs experience the blended learning environment. STEM students' higher satisfaction with implementation suggests an interplay between their technical curriculum orientation and their ability to navigate online learning platforms effectively. Meanwhile, viewing these differences through the Community of Inquiry framework reveals how academic context influences the three presences. The GAS students' higher satisfaction with faculty performance (W

= 4.15, p = .018 compared to STEM) suggests that teaching presence may be more effectively established in their context, possibly due to the nature of their curriculum allowing for more flexible and varied online teaching approaches. Conversely, ABM students' lower satisfaction might indicate challenges in establishing effective cognitive presence in their practice-oriented subjects through online means.

Significant differences in evaluations across academic strands highlight the need for a more nuanced approach to learning technology implementation. The more positive evaluations among STEM students regarding online learning component implementation, and among GAS students regarding faculty performance, suggest that certain curricula or teaching approaches may be particularly well-suited to the blended learning model. This supports Mercado's (2021) finding that blended learning effectiveness can vary depending on subject matter and program-specific needs.

To gain deeper insights into students' experiences with the online component of blended learning, participants identified their top three challenges and opportunities. Categorical frequency analysis revealed consistency across grade levels and academic strands, with some variations in percentages found in Table 4.

Table 4
Top Three Challenges and Opportunities in Online Component of Blended Learning by Grade Level and Academic Strand

Category	Challenges	Opportunities
Grade 11 (n=809)	1. Too much workload/ assignment (76.5%)	1. Budgeting time and resources (76.8%)
	2. Unstable internet connection (71.3%)	2. Exploring multiple learning tools (71.9%)
	3. Mental health (43.1%)	3. Have more time with family (43.5%)
Grade 12 (n=641)	1. Unstable internet connection (73.9%)	1. Budgeting time and resources (76.1%)
	2. Too much workload/ assignment (73.3%)	2. Exploring multiple learning tools (69.9%)
	3. Mental health (43.1%)	3. Have more time with family (45.9%)
STEM (n=679)	1. Too much workload/ assignment (78.1%)	1. Budgeting time and resources (80.0%)
	2. Unstable internet connection (72.6%)	2. Exploring multiple learning tools (74.8%)
	3. Mental health (45.7%)	3. Have more time with family (43.3%)

Category	Challenges	Opportunities
ABM (n=399)	1. Unstable internet connection (73.4%)	1. Budgeting time and resources (74.7%)
	2. Too much workload/ assignment (72.9%)	2. Exploring multiple learning tools (69.2%)
	3. Mental health (41.9%)	3. Have more time with family (45.9%)
HUMSS (n=233)	1. Too much workload/ assignment (74.2%)	1. Exploring multiple learning tools (73.4%)
	2. Unstable internet connection (70.0%)	2. Budgeting time and resources (69.1%)
	3. Mental health (42.5%)	3. Have more time with family (44.2%)
GAS (n=139)	1. Unstable internet connection (71.2%)	1. Exploring multiple learning tools (71.2%)
	2. Too much workload/ assignment (69.1%)	2. Budgeting time and resources (69.8%)
	3. Mental health (36.7%)	3. Have more time with family (47.5%)
Overall (n=1450)	1. Too much workload/ assignment (75.2%)	1. Budgeting time and resources (76.5%)
	2. Unstable internet connection (72.4%)	2. Exploring multiple learning tools (71.0%)
	3. Mental health (43.1%)	3. Have more time with family (44.6%)

Primary challenges were: too much workload/assignment (69.1-78.1%), unstable internet connection (70.0-73.9%), and mental health concerns (36.7-45.7%). STEM students reported the highest percentage for workload concerns (78.1%). Grade 12 and ABM students ranked "unstable internet connection" as their top challenge, while other groups ranked "too much workload/assignment" first.

Key opportunities identified were: budgeting time and resources (69.8-80.0%), exploring multiple learning tools (69.1-74.8%), and having more time with family (43.3-47.5%). STEM students reported the highest percentage for budgeting time and resources (80.0%). GAS students showed a slightly different pattern, with "exploring multiple learning tools" (71.2%) ranking slightly higher than “budgeting time and resources" (69.8%).

Percentages across grade levels were similar, suggesting consistency throughout high school. However, Grade 12 students reported slightly higher percentages for "having more time with family" (45.9% vs 43.5% for Grade 11).

Analysis of student feedback revealed three distinct categories of challenges in the online learning environment. Workload management emerged as the predominant concern, particularly among STEM students who reported the

highest level of assignment-related stress. Technical infrastructure challenges manifested primarily through internet connectivity issues, with Grade 12 and ABM students being the most affected. Mental health emerged as a significant third-tier concern, though its impact varied notably across academic strands. These findings echo Tadeo and Bacuyag's (2023) study on Filipino senior high school students during the COVID-19 pandemic, particularly regarding workload management, internet connectivity, and mental health challenges.

The opportunities identified by students demonstrated a strong focus on skill development. Time management capabilities emerged as the primary benefit, particularly among STEM students who showed the highest appreciation for this aspect. The diversity of learning tools available created the second most recognized opportunity, though interestingly, GAS students uniquely prioritized this aspect over time management benefits. Family interaction opportunities, while consistently recognized across groups, showed subtle variations between grade levels that merit further investigation. These opportunities, especially in time management and self-directed learning, align with Baluyos et al.'s (2023) findings on digital literacy and self-directed learning readiness.

The identified challenges and opportunities across grade levels and academic strands particularly align with two theoretical frameworks. Through Cognitive Load Theory (Sweller, 1988), the predominant challenge of workload management suggests students are experiencing high extraneous cognitive load that may impede learning. However, the opportunities identified, particularly in time management and learning tool exploration, demonstrate Self-Regulated Learning Theory (Zimmerman, 2000) in action, as students develop strategies to manage their learning environment despite these challenges.

A constant comparative analysis of 1,450 student responses revealed nine key categories for improving online components of blended learning as seen in Table 5. The most prevalent category was Reduce Workload (30.1%), slightly more pronounced among Grade 11 students (31.2%) compared to Grade 12 (28.7%). A Grade 12 STEM student commented, "The amount of workload we have every week is not helpful at all, it's like we are being forced to do those just for the sake of passing and not learning."

Improve Time Management (17.4%) emerged as the second most common category, particularly among STEM students (18.3%). A Grade 11 STEM student suggested, "Plan well the schedules of tasks, so that students do not be (sic) confused by the deadline of their requirements."

Enhance Teacher Support (15.0%) was the third most frequent suggestion, with HUMSS students (17.3%) emphasizing this more than other strands. A Grade 11 HUMSS student noted, "Teachers should be more understanding and at least be nice while discussing the lessons."

Other categories included Improve Content Delivery (12.1%), Address Technical Issues (6.1%), Prioritize Mental Health (5.9%), Enhance Peer Interaction (3.0%), and Improve Assessment Methods (2.7%). ABM (7.2%) and HUMSS (7.3%) students emphasized mental health concerns more than STEM students

(4.5%). The category No Suggestion / Satisfied (7.8%) had a higher percentage in Grade 12 (9.1%) compared to Grade 11 (6.7%).

Table 5
Improvement Categories Identified Through Constant Comparative Analysis by Grade Level and Academic Strand

Categories	Overall	Grade 11	Grade 12	STEM	ABM	HUMSS	GAS
1. Reduced Workload	30.1%	31.2%	28.7%	31.5%	28.9%	29.1%	27.4%
2. Improve Time Management	17.4%	17.0%	17.8%	18.3%	17.4%	15.9%	15.1%
3. Enhance Teacher Support	15.0%	15.7%	14.2%	13.9%	15.2%	17.3%	15.1%
4. Improve Content Delivery	12.1%	12.8%	11.2%	13.0%	11.0%	11.8%	10.4%
5. Address Technical Issues	6.1%	5.8%	6.5%	6.9%	5.9%	4.5%	6.6%
6. Prioritize Mental Health	5.9%	5.2%	6.6%	4.5%	7.2%	7.3%	5.7%
7. Enhance Peer Interaction	3.0%	3.2%	2.7%	2.5%	3.7%	2.8%	3.8%
8. Improve Assessment Methods	2.7%	2.3%	3.2%	2.9%	2.4%	2.4%	2.8%
9. No Suggestion/ Satisfied	7.8%	6.7%	9.1%	6.4%	8.3%	9.0%	11.3%

These findings align with Therisa Beena et al.'s (2022) observations on workload challenges in online learning and Baluyos et al.'s (2023) findings on digital literacy and self-directed learning. The importance of teacher support echoes Joaquin et al.'s (2020) emphasis on teacher presence in online environments. The variation in mental health concerns across strands extends Tadeo and Bacuyag's (2023) work, while the "No Suggestion / Satisfied" category aligns with Martin et al. (2021) findings on high school students' adaptability to online learning. The improvement categories identified primarily reflect aspects of the Community of Inquiry framework (Garrison et al., 2000). The emphasis on enhanced teacher support and improved content delivery demonstrates students' need for stronger teaching presence, while suggestions for better peer interaction highlight the importance of social presence in the online learning environment. These elements together suggest that strengthening these presences could address many of the identified areas for improvement.

Conclusion

This study provides insights into blended learning, specifically online aspects

of implementation in a Philippine senior high school, with implications for global education, particularly in developing countries (Bozkurt et al., 2020). Findings highlight the need for customized approaches across academic strands, echoing international studies (Rasheed et al., 2020). Consistent challenges in workload management and teacher support reflect global concerns in online and blended learning (Zhang et al., 2021).

This study provides valuable insights into blended learning, specifically online aspects of implementation within the context of a well-resourced private senior high school in the Philippines. While the findings offer important perspectives on student experiences with blended learning, it is essential to acknowledge the study's specific context and limitations. The experiences documented here reflect those of students in an environment with established technological infrastructure and institutional support for blended learning online implementation.

Key findings regarding workload management, time management support, and student-teacher relationships in virtual environments may be particularly relevant for similar educational contexts. However, these findings should be interpreted within the specific parameters of the study: a private school setting with adequate resources and infrastructure to support comprehensive blended learning implementation.

Building upon these contextual findings, we recommend future research directions that address current methodological limitations: (1) integration of learning outcomes assessment to validate student perceptions, (2) incorporation of teacher perspectives through mixed-methods approaches, (3) examination of the interplay between online and face-to-face components, and (4) extension to diverse institutional settings, particularly public schools and resource-constrained environments. For institutions with similar resources, practical recommendations include optimizing online workload distribution, enhancing teacher support systems for online delivery, and developing strand-specific approaches to content delivery. These targeted improvements should be supported by structured faculty development programs and regular feedback mechanisms to ensure continuous enhancement of the blended learning experience.

References

Adedoyin, O. B., & Soykan, E. (2020). Covid-19 pandemic and online learning: the challenges and opportunities. *Interactive Learning Environments,* 31(2), 863–875. https://doi.org/10.1080/10494820.2020.1813180

Alibuyog, R. P., Laguador, J. M., & Portugal, L. M. (2022). Effectiveness of blended learning approach in teaching senior high school science. *International Journal of Educational Management and Development Studies,* 3(1), 28-40. https://doi.org/10.53378/346106

Alipio, M. (2020). Education during Covid-19 Era: Are Learners in a Less-Economically Developed Country Ready for E-Learning? *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3586311

Almaiah, M. A., Al-Khasawneh, A., & Althunibat, A. (2020). Exploring the critical challenges and factors influencing the E-learning system usage during COVID-19 pandemic. *Education and Information Technologies*, 25, 5261-5280. https://doi.org/10.1007/s10639-020-10219-y

Almerino, P. M., Ocampo, L. A., Abellana, D. P. M., Almerino, J. G. F., Mamites, I. O., Pinili, L. C., Tenerife, J. J. L., Sitoy, R. E., Abelgas, L. J., & Peteros, E. D. (2020). Evaluating the academic performance of K-12 students in the Philippines: A Standardized Evaluation approach. *Education Research International*, 1–8. https://doi.org/10.1155/2020/8877712

Alvarez, A. J. (2020). The phenomenon of learning at a distance through emergency remote teaching amidst the pandemic crisis. *Asian Journal of Distance Education*, 16(1), 144-171. https://www.asianjde.com/ojs/index.php/AsianJDE/article/view/453

Baluyos, G. R., Sumagaysay, L. V., & Melendres, G. O. (2023). Digital literacy and self-directed learning readiness of senior high school students in the Philippines. *International Journal of Learning, Teaching and Educational Research*, 22(1), 123-140. https://doi.org/10.26803/ijlter.22.1.8

Boeije, H. (2002). A purposeful approach to the constant comparative method in the analysis of qualitative interviews. *Quality and Quantity,* 36(4), 391-409. https://doi.org/10.1023/A:1020909529486

Bongco, R. T., & David, A. P. (2020). Filipino teachers' experiences and challenges in remote education during COVID-19. *Education and Information Technologies*, 25, 7741-7748. https://doi.org/10.1007/s10639-020-10332-y

Bouilheres, F., Le, L. T. V. H., McDonald, S., Nkhoma, C., & Jandug-Montera, L. (2020). Defining student learning experience through blended learning. *Education and Information Technologies,* 25, 3049-3069. https://doi.org/10.1007/s10639-020-10100-y

Bozkurt, A., Jung, I., Xiao, J., Vladimirschi, V., Schuwer, R., Egorov, G., ... & Paskevicius, M. (2020). A global outlook to the interruption of education due to COVID-19 pandemic: Navigating in a time of uncertainty and crisis. *Asian Journal of Distance Education,* 15(1), 1-126. https://doi.org/10.5281/zenodo.3878572

Coman, C., Țîru, L. G., Meseşan-Schmitz, L., Stanciu, C., & Bularca, M. C. (2020). Online teaching and learning in higher education during the coronavirus pandemic: Students' perspective. *Sustainability,* 12(24), 10367. https://doi.org/10.3390/su122410367

Dangle, Y. R. P., Sumaoang, J. D., & Ocampo, L. J. (2022). Comparing Grade 11 and Grade 12 students' perceptions of blended learning in Philippine public senior high schools. *International Journal of Educational Research Review*, 7(3), 206-215. https://doi.org/10.24331/ijere.1098432

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319-340. https://doi.org/10.2307/249008

Dumlao, R. P. & Mengorio, T. (2019). From Inland to Outland: Experiences of Non-native Expatriate Teachers Teaching in a Foreign Context. *Journal of English Education,* 4(1), 24-37. doi: http://dx.doi.org/10.31327/jee.v4i1.898

Garrison, D. R., Anderson, T., & Archer, W. (2000). Critical inquiry in a text-based environment: Computer conferencing in higher education. *The Internet and Higher Education*, 2(2-3), 87-105. https://doi.org/10.1016/S1096-7516(00)00016-6

Glaser, B. G., & Strauss, A. L. (1967). *The discovery of grounded theory: Strategies for qualitative research.* Aldine.

Guba, A. G., Macasaet, C. J., & Santos, R. G. (2023). Effectiveness of online learning tools in developing financial literacy skills among senior high school students in the Accountancy, Business, and Management (ABM) strand. *Asian Journal of Business and Accounting,* 16(1), 167-192. https://doi.org/10.22452/ajba.vol16no1.6

Joaquin, J. J. B., Biana, H. T., & Dacela, M. A. (2020). The Philippine higher education sector in the time of COVID-19. *Frontiers in Education,* 5. https://doi.org/10.3389/feduc.2020.576371

Martin, A., Collie, R., & Nagy, R. (2021). Adaptability and High School Students' Online Learning During COVID-19: A Job Demands-Resources Perspective. *Frontiers in Psychology,* 12. https://doi.org/10.3389/fpsyg.2021.702163.

Mercado, K. A. O. (2021). Blended learning approach in the Philippine public senior high schools. *Jurnal Pendidikan Progresif,* 11(2), 345-360. https://doi.org/10.23960/jpp.v11.i2.202117

Mercado, T. C., & Ibarra, F. P. (2022). Institutional support and faculty performance in blended learning: A case study of Philippine higher education institutions. *Journal of Education and e-Learning Research,* 9(1), 1-9. https://doi.org/10.20448/jeelr.v9i1.3699

Oducado, R. M. F., & Estoque, H. (2021). Online learning in nursing education during the COVID-19 pandemic: Stress, satisfaction, and academic performance. *Journal of Nursing Practice,* 4(2), 143-153. https://doi.org/10.30994/jnp.v4i2.128

Orlanda-Ventayen, C. C. (2023). Blended learning approach in developing critical thinking skills of senior high school students. International *Journal of Educational Innovation and Science,* 4(1), 159-166. https://doi.org/10.23977/ijeis.2023.040124

Palaoag, T. D., Sario, M. L. P., & Chua, R. C. (2021). Online learning experiences of Humanities and Social Sciences (HUMSS) students during the COVID-19 pandemic. *International Journal of Learning, Teaching and Educational Research,* 20(3), 331-348. https://doi.org/10.26803/ijlter.20.3.19

Poirier, M., Law, J. M., & Veispak, A. (2019). A spotlight on lack of evidence supporting the integration of blended learning in K-12 education: A systematic review. *International Journal of Mobile and Blended Learning,* 11(4), 1-14. https://doi.org/10.4018/IJMBL.2019100101

Rabacal, J. S., & Alegato, C. J. (2021). Online learning engagement and academic performance of Grade 11 and Grade 12 students in the new normal. *International Journal of Learning, Teaching and Educational Research,* 20(8), 183-199.https://doi.org/10.26803/ijlter.20.8.11

Rabacal, J. S., Geroso, M. J. S., & Oliveros, J. A. (2022). Developing students' 21st century skills using project-based learning in senior high school: Basis for proposed learning model. *International Journal of Learning, Teaching and Educational Research,* 21(2), 124-143. https://doi.org/10.26803/ijlter.21.2.8

Rahiem, M. D. (2020). The emergency remote learning experience of university students in Indonesia amidst the COVID-19 crisis. *International Journal of Learning, Teaching and Educational Research,* 19(6), 1-26. https://doi.org/10.26803/ijlter.19.6.1

Rapanta, C., Botturi, L., Goodyear, P., Guàrdia, L., & Koole, M. (2020). Online university teaching during and after the Covid-19 crisis: Refocusing teacher presence and learning activity. *Postdigital Science and Education*, 2(3), 923-945. https://doi.org/10.1007/s42438-020-00155-y

Rasheed, R. A., Kamsin, A., & Abdullah, N. A. (2020). Challenges in the online component of blended learning: A systematic review. *Computers & Education,* 144, 103701. https://doi.org/10.1016/j.compedu.2019.103701

Sweller, J. (1988). Cognitive load during problem solving: Effects on learning. *Cognitive Science,* 12(2), 257-285. https://doi.org/10.1207/s15516709cog1202_4

Tadeo, M. F. A., & Bacuyag, K. J. N. (2023). Senior high school students' online learning experiences during COVID-19 pandemic. *Journal of Research in Social Science and Humanities*, 3(2), 1-14. https://doi.org/10.56692/jorssh.2023.3201

Tamayao, A. I. C., Vecaldo, R. T., Asuncion, J. E., Mamba, M., Paat, F. M., & Pagulayan, E. S. (2020). Design and validation of the Blended Learning Readiness Scale for Filipino senior high school students. *International Journal of Learning, Teaching and Educational Research,* 19(8), 183-201. https://doi.org/10.26803/ijlter.19.8.10

Therisa Beena, K. K., Sony, M., & Castellani, M. (2022). Student workload assessment for online learning: An empirical analysis during Covid-19. *Cogent Engineering*, 9(1). https://doi.org/10.1080/23311916.2021.2010509

Toquero, C. M. (2020). Challenges and opportunities for higher education amid the COVID-19 pandemic: The Philippine context. *Pedagogical Research*, 5(4), em0063. https://doi.org/10.29333/pr/7947

Toquero, C. M. (2021). Emergency remote education experiment amid COVID-19 pandemic. *International Journal of Educational Research and Innovation,* 15, 162-176. https://doi.org/10.46661/ijeri.5113

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes.* Harvard University Press.

Zhang, W., Wang, Y., Yang, L., & Wang, C. (2021). Suspending classes without stopping learning: China's education emergency management policy in the COVID-19 outbreak. *Journal of Risk and Financial Management,* 13(3), 55. https://doi.org/10.3390/jrfm13030055

Zimmerman, B. J. (2000). Attaining Self-Regulation. In *Elsevier eBooks* (pp. 13–39). https://doi.org/10.1016/b978-012109890-2/50031-7