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Effects of Blended Learning on Academic Performance of Students at Young Achievers' School of Caloocan

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Abstract

This study shows the effects of blended learning on students' academic performance. The scope of this research were only the Grade 12 Accountancy, Business and Management (ABM) students at Young Achievers' School of Caloocan, Inc. The purpose of this study is to gain a deeper understanding and provide a valuable information of how this variable affects to each other. Using purposive research design, researchers aim to conduct this study in its effects. The data gathering instrument was used in this study to gather the data through an online survey via Google Forms with selected Grade 12 Accountancy, Business, and

Management (ABM) students. The collected responses are analyses using Simple linear regression which is related on our variables. It shows the result that these effects of blended learning significantly affect academic performance of students. The respondents of this study have 100 students from Accountancy, Business and Management strand that covers most of the students from the studied strand makes the research findings more effective and better data have gathered to ensure this study is more effective. Furthermore, the study shows that understanding these effects could promote a study that is valuable and useful information.

Keywords: Blended Learning, Purposive Research, Linear Regression, Business Management, Google Forms

1. The Introduction and Review of Related Literature

This chapter contains the introduction of the study, which explains what the research is about. It also presents the background of the study, which tells why the topic was chosen. It contains the review of related literature, which shows ideas from other studies, and the synthesis of literature, which combines these ideas. The conceptual framework shows how the variables are related. The statement of the problem lists the questions the study wants to answer, while the hypotheses give the expected results. It also includes the significance of the study, the scope and limitation, and the definition of terms to help readers understand the study better.

Introduction

In today's generation, blended learning helps students to learn in different aspects. Including, online and face-to-face classes. This schedule has a significant effect on their academic performance especially in their time. Time that most of the students will adjust and manage on their own. Because of that, each of us must include education due to its contribution in our society. It provides knowledge, improvement of skills, and makes students prepared for opportunities in the future. As technology continued to advance, the educational system changed by using teaching and learning methods. Learning becomes more flexible, accessible, and engaging for both students and teachers. Among today's youth, students are more grade conscious than before. It shows that their dedication and commitment will result to a good outcome which they can use in the future. Besides, academic performance plays an important role that students to not give up and their academic performance can evaluate the behavior that they invest. In addition, teachers teaching skills are very important for students to understand the lessons they

teach. Student academic performance may affect, especially their comprehension to understand the lessons. Blended learning makes students more productive and resourcefulness to get a high grade even if it hard. They can participate whenever they want. They can use the knowledge for their everyday lives. Because blended learning may contribute to a higher level of knowledge that students improve themselves.

This study focuses on examining the academic performance Accountancy, Business and Management students with the help of blended learning. Knowing the respondents' perspective of learning from blended learning, this research can check what difference or influence it can provide whether it's positive or negative effects to know how it impacts the students on how they learn, participate, and communicate to their fellow students and their teachers.

Background of the Study

Education is one of the important of every student's life, it helps them improve their skills, gain knowledge, learning new things, and prepare learners for future responsibilities. Additionally, it has a big impact of how students independently, communication, and make decision. As the needs of student continue to change, schools also continue to improve their teaching methods so they can provide and give what students deserve for a better learning experience for learners. Schools have introduced different teaching methods and digital tools to make learning more flexible, accessible, and effective. These changes have allowed students to continue learning both inside the classroom and house, while improving their ability to use technology for educational purposes.

Blended Learning is one of the teaching strategies that is now commonly used in schools. This method combines of traditional face-to-face and instruction with online learning using technology, allowing learners to continue their studies through both classroom activities and digital platform on their house. Through this method, students can attend on their classes while they are at home. Learners can also take a quizzes, completing assignments, and learning materials through digital platforms. This combination gives students more opportunities to continue learning beyond the classroom and provides greater flexibility in completing their academic tasks.

This study focuses on examining the academic performance Accountancy, Business and Management students with the help of blended learning. Makkar and Sharma (2022) states that blended learning has combined both traditional and online classes and suggests that there is less participation of students if we rely on purely online approaches in class. Additionally, Macario and Marle (2026) state that students have positive ratings to blended learning such as acceptance, satisfaction, engagement, flexibility, collaboration, and technological competence. Mean ratings indicated that blended learning was generally well-received and considered effective. Their studies show that blended learning is positively received by students and considered helpful.

Based on these ideas, this study aims to examine how blended learning influences students' classroom performance in terms of attendance, participation, and engagement.

Review of Related Literature

This study investigates the impact of blended learning on student performance, employing a quantitative research design. Blended learning, which integrates online and face-to-face instruction, has gained popularity due to its potential to enhance educational outcomes. Tabassum, Bushra *et al*, (2024) ^[18] The Impact of Blended Learning on Student Performance.

Blended Learning has gained significant attention for its potential to enhance student achievement. However, its implementation in secondary education, especially in developing countries like Ethiopia, faces barriers such as infrastructure limitations, pedagogical challenges, and socio-economic factors.

Alrasheedy, Benayan *et al*, (2025) ^[2] The effect of blended learning on enhancing motivation for academic achievement in students in the faculties of humanity sciences at hail university.

This study aimed to investigate the effect of blended learning on enhancing motivation for academic achievement in students of humanity sciences (education and arts) at Hail University. Abdissa, Dinkissa *et al*, (2025) ^[1] The Effect of Blended Learning Educational Model on Secondary School Students' Mathematics Achievement.

This study aims to systematically review studies that examine the critical success factors for blended learning from the perspectives of the learner, instructor, course, design, technology, and environment. Min, W., & Yu, Z. (2023) ^[15]. A systematic review of critical success factors in blended learning.

This study meta-analytically reviews blended learning outcomes and student attitudes by including 30 peer-reviewed journal articles and 70 effect sizes. Yu, Z., Xu, W., & Sukjairungwattana, P. (2022) ^[21]. Meta-analyses of differences in blended and traditional learning outcomes and students' attitudes.

This study asserts that many visible opportunities have emerged in Chinese higher education through the applications of BL (Blended Learning). Ashraf, M. A., Mollah, S., Perveen, S., Shabnam, N., & Nahar, L. (2022) ^[3]. Pedagogical applications, prospects, and challenges of blended learning in Chinese higher education: A systematic review.

While this special pandemic period has been seeing an increasing use of blended learning, few studies have meta-analytically reviewed the effectiveness of blended learning in different countries. This meta-analysis summarizes previous studies on blended learning effectiveness in different countries in terms of students' performance, students' attitudes toward blended learning, learning achievement, and student engagement in different countries. Cao, W. (2023) ^[6]. A meta-analysis of effects of blended learning on performance, attitude, achievement, and engagement across different countries.

The purpose of this study is to synthesize the overall effects of blended learning on K-12 student performance, distinguish the most effective domains of learning outcomes, and examine the moderators of the overall effects. Li, S., & Wang, W. (2022) ^[13]. Effect of blended learning on student performance in K-12 settings: A meta-analysis.

Individuals attempting to study remotely during the COVID-

19 lockdown will find that blended learning is a helpful solution and results in a significant increase in learning engagement. The best benefits for teachers and students are obtained by maximizing the advantages of each teaching method and by combining the advantages of online and face-to-face instruction.

The study aims to investigate the effectiveness of the flex model of blended learning in teaching the mathematics subtopic of coordinates in the plane through the improvement of students' academic achievement, self-study skills and learning attitudes. Tong, D. H., Uyen, B. P., & Ngan, L. K. (2022). The effectiveness of blended learning on students' academic achievement, self-study skills and learning attitudes: A quasi-experiment study in teaching the conventions for coordinates in the plane.

Indicating that blended instruction has above-moderate positive effects on student performance, especially on student learning motivation and academic emotions and attitude; In terms of education levels, experimental periods and class sizes, blended instruction has the most significant positive effect on junior and senior secondary school students, on a teaching period from one to three months, and on a class size of 51 to 100 students; Regarding the proportion and interactive patterns of online teaching, 50% composition of online teaching and synchronous or synchronous + asynchronous interaction exert the most significant positive effects on student learning. Li, B., Yu, Q., & Yang, F. (2022) ^[14]. The effect of blended instruction on student performance: A meta-analysis of 106 empirical studies from China and abroad.

This study aims to determine the relationship between blended learning delivery to the academic achievement of Grade 10 learners in Araling Panlipunan of Malaybalay City National Science High School of School Year 2021-2022. Santillan, Alberto and Olana, Susan (2025). Blended Learning and the Academic Achievement of Grade 10 Learners in Araling Panlipunan during COVID-19 Pandemic.

Marin, Raul and Amparo, Janice (2025) The Impact of Blended Learning on Self-Concept, Motivation, and self-efficacy, in Mathematics Performance. This causal research examined how blended learning influences the relationship between students' self-concept, motivation, self-efficacy, and performance in Basic Calculus.

This study aimed to investigate and determine the effectiveness of blended learning in the context of new ways in teaching and learning to enhance students' academic achievement. Garcia, Shiela (2022) ^[9] Blended Learning Education: The Effectiveness of New Ways of Teaching and Learning in Enhancing Students' Academic Achievement.

The students Agreed that that their online and face-to-face classes are executed with proper time management, with all the necessary learning materials, and with acceptable, appropriate, and inevitable learning environment. In addition, the respondents had good grades in Mathematics and English in three school years. More so, there is a high positive correlation between the English and Mathematics grades of the respondents in three consecutive school years. Solano, E. (2023). Pupils' study habits in blended learning modality and their academic performance in Mathematics and English: Inputs for an intervention program.

The level of effectiveness of blended learning approach was fairly effective as assessed by both teachers and students. The students' performance was described as above average.

Further, the effectiveness on the use of blended learning approach has a significant relationship with the students' performance. It is recommended that that the teachers' expertise in using the said approach is indispensable.

Vilo, A. M. E., & Taha, H. S. (2023) ^[20]. Effectiveness on the use of blended learning approach (BLA): Its implications on the students' performance.

The purpose of this research is to assess blended learning (BL) implementation and student's academic performance toward an enhanced instructional policy that makes blended learning effective. The study adopted a descriptive-correlational design. It involved selected junior high school students. Huerto, M. J. (2024) ^[11]. Assessment of blended learning implementation and student's academic performance toward enhanced instructional policy.

In the integration of both online and face-to-face interactions, blended learning has become a significant educational approach. Results show that the implementation of the program was effective in its effect on the satisfaction and engagement levels and academic performance of students and its impact on parents. These findings indicate that effective implementation of blended learning is a factor in students' success. The researcher postulate recommendations to address a few gaps. Gingoyon, E. (2023) ^[10]. Implementation of blended learning modality: An evaluation based on ABCD model. CNU Journal of Higher Education.

The study aims to determine if there is a significant relationship between students' perception, learning environment, and their level of engagement in blended learning modalities. Pelarca, R. B., Malicia, J. C., & Nuezca, A. P. (2024). Students' perception and learning environment on their level of engagement in blended learning modality.

The aim of this research was to determine the teachers' and students' readiness on blended learning. Also, the struggles encountered by the teachers as well their best practices in the blended learning modalities were identified. Cajucom, E., Lopez, I. N., Valdez, J., Villanueva, J., Balonquita, W., & Sonday, J. A. (2022) ^[5]. Readiness in adopting a blended learning approach in science: challenges encountered and breakthroughs.

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. Samson, J. C. M., Abrenica, K. F. C., Delfin, R. J. M., & Arcinas, M. M. (2023). Unraveling the effectiveness of blended learning: key factors for effective implementation from the perspectives of senior high school students.

Synthesis of Literature

The studies of Olana and Santillan (2025) and Vilo and Taha (2023) ^[20] showed that blended learning has a significant effect on students' academic performance. Their findings revealed that students perform better when blended learning methods are used effectively. These studies are connected to our research because they help us predict whether blended learning also affects the academic performance of students at Young Achievers' School of Caloocan.

Bolen-Amparo and Marin (2025) found that blended

learning can improve performance, especially when students have confidence in their abilities.

Garcia (2022) ^[9] also stated that effective teaching strategies and proper use of technology improve learning.

These studies help us determine other factors that may affect students' academic performance aside from blended learning itself.

Journal of Education and Social studies (2024) this study helped us to determine if whether blended learning that is physical and online has a positive or negative effects on students' academic performances.

The EERA Conference (2023) study helped us to identify the influence of the effectiveness on blended learning by combining the face-to-face and online classes, teachers and students' interaction to each other, and participating in class discussions or activities.

ERIC journal Article (2026) This study is relevant because it explains how students' engagement, participation, and learning experiences in blended learning is beneficial and improves or decreased to their academic performance.

MDPI Education Sciences (2023) helped us understand on how teachers' support, learning strategies, and access to technology can improve the effectiveness of blended learning.

Finally, Frontiers in Psychology (2023) this study is connected to our research because it gives us an evidence whether blended learning enhanced students' performance, students' attitudes towards blended learning, learning achievement, and student engagement.

Lastly, Solano (2023) found that study habits, time management, and learning environment are related to academic performance. This study is relevant because it helps us understand how students' habits may affect their performance in blended learning. Overall, these RRLs support our study by helping us understand the different factors that influence academic performance.

Nadia Shabnam (2022) This help us to determine the practice of teaching and learning through both online and traditional methods, the aspects of blended learning are most likely influence academic performance. such as motivation and participation. This study also emphasized learning motivation and performance contribute by the positive effects if blended learning on performance.

Cao, W. (2023) ^[6] This help us to determine to know if the blended learning has really effects on academic performance. The study shows that blended learning did not significantly improve students engagement in other countries, indicating that academic performance may have not always change together.

Baomin L. (2022) This study helps us to predict that blended learning will have a moderate positive effects academic performance, This guided us to expect that students may be also become more motivated and participating when blended learning is used.

Shugin Li, Weihua W. (2022) This study guide us in our research to predict that blended learning will have a improvement on academic on performance. It may not necessary improve student grade to the same performance of testing.

Doung Huu T. (2022) This study guide' us to predict blended learning will improve academic achievement. This study also helped us that blended learning may improve students self study skills and participation towards learning.

Gingoyon (2023) ^[10] This study demonstrates that effective blended learning creates increased levels of student engagement, learning opportunities, and academic performance, and represents an example of how blended learning can increase the student-related areas of interest in our study regarding "The Effects of Blended Learning on Grade 12 Students at the Young Achievers School of Caloocan.

Huerto, M. J. (2024) ^[11] This paper assisted us in realizing that proper implementation of blended learning can positively influence the learning experience of students, and this will help develop good instructional policy, which is important for our study on the impact of blended learning on Grade 12 students' participation.

Conceptual Framework

This study uses the Independent Variable–Dependent Variable (IV–DV) Model as its conceptual framework. This model helps explain the relationship between the variables in the study. The independent variable is blended learning, while the dependent variable is the academic performance of students. The model shows that blended learning may affect the academic performance of students at Young Achievers' School of Caloocan.

The IV–DV Model serves as a guide in conducting this study. It helps the researchers understand how the independent variable may influence the dependent variable.

Through this framework, the researchers will determine whether blended learning has a significant effect on the academic performance of students. The results of the study may also help improve teaching and learning practices in the school.

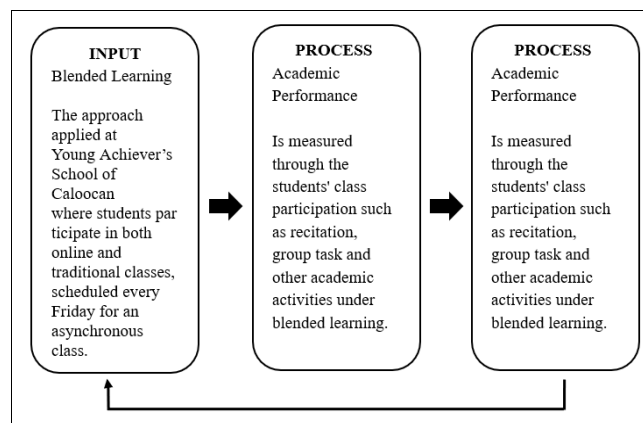


Fig 1: Feedback

The input describes the blended learning approach at Young Achievers' School of Caloocan where students participate in both face-to-face and asynchronous classes which is scheduled every Friday. The process shows how academic performance is measured to gather data from students from their class participation in activities from blended learning and after analyzing and interpreting the data, the output determines the significant effects of blended learning to the academic performance of students based on what will be the findings of this study.

Statement of the Problem

This study aims to examine the effects of blended learning to Grade 12 Accountancy, Business and Management students regarding on academic performance. Specifically,

this study seeks to answer the following questions:

1. What is the level of Blended Learning among Grade 12 Accountancy, Business and Management students in terms of traditional and online class;
2. Is there a significant relationship between Blended Learning and Academic Performance among Grade 12 Accountancy, Business and Management students at Young Achievers' School of Caloocan, Incorporated?

Hypotheses of the Study

To address what hypothesis we chose, the null (H_0) and alternative (H_1) are already formulated for this study. First, what is null hypothesis? Null hypothesis predicts zero or neutrally. It is usually use the "no relationship" and "no significance". This hypothesis use when the study is finding if where no relationship between the variables. While the alternative hypothesis, predicts a change, relationship, or expect to find. The word that is usually use in this hypothesis "a significant difference" or "a significance positive difference". This hypothesis use when the study is finding if there is a significance differences between the variables. Researchers chose the Alternative hypothesis. Because researchers want to know if there is a significant difference between blended (IV) learning and academic performance (DV) of students. Why researchers chose this hypothesis? Because researchers want to examine why Blended Learning has a significant effect on their academic performance.

Significance of the Study

For the Teachers

The study facilitates teachers' understanding of the effect of blended learning on their performance. Blended learning can really make a difference in teacher performance. It can also help teachers to improve their activities, attendance, and class participation at school.

For the Parents

This study may help parents comprehend how blended learning affects their kids' academic performance. Student performance can be significantly impacted by blended learning. Additionally, it can assist students in enhancing their involvement in class, activities, and attendance. Parents must learn because it improves their ability to support their children. Students can achieve academic success through blended learning.

For the Students

This study may help students understand how blended learning affects their performance. Blended learning can really make a difference in the performance of students. It may also help students improve their activities, attendance and class participation in school. The study of learning is important, for students because it helps them learn better.

For the Future Researchers

This research will provide future researcher with insights of this study and guiding their exploration of educational strategies and innovations.

Scope and Limitation of the Study

This quantitative study primarily focuses on blended learning and its effect on academic performance. The independent variable is limited to blended learning

(specifically online class and face-to-face classes), while dependent variable is the academic performance of students' general average during the 3 weeks on the 1st term during the academic year of 2026-2027. The respondents of this study will be Grade 12 Accountancy, Business and Management students who enrolled at Young Achievers' School of Caloocan, Incorporated. Others from Humms, Gas, Stem and Ict are excluded from this study, because only the ABM possess the specific specialization of our study. The study exclusively conducted through online survey via Google Forms. This study exclusively conducted through online survey via Google Forms. This study utilizes a descriptive research design and Simple linear regression for our statistical calculation. Researchers chose the Simple linear regression because it is used to look if there a relationship between two quantitative variables. Our Independent variable (IV) and Dependent variable (DV) which is related to our study. Furthermore, it aims to describe the current status of the variables and it will not establish the comparison of variables.

Definition of Terms

To make the study easier to understand, the important terms used in this study are defined:

Academic Performance: Refers to the students' achievement in school. In this study, it is measured through attendance, participation, and engagement.

Attendance: Refers to the students' presence during face-to-face and online classes.

Blended Learning: A teaching approach that combines face-to-face and online learning.

Digital Platforms: Refers to online applications or websites used for teaching and learning.

Engagement: Refers to the students' interest and active involvement in learning.

Examining: Refers to analyzation, inspect or something you want to know.

Face-to-Face Learning: Refers to classroom instruction where teachers and students meet in person.

Learning Materials: Refers to the resources used by students, such as modules, presentations, videos, and online files.

Online Learning: Refers to learning conducted through digital platforms and the internet.

Participation: Refers to the students' involvement in classroom and online activities.

2. Methods

This chapter contains the methods used in the study. It explains the research design, which shows how the study was conducted. It also includes the locale of the study, which describes where the research took place. Explains the data gathering procedure, which shows the steps followed in collecting data, and the data gathering instrument, which refers to the tools used in getting the needed information. Lastly, it includes the statistical tools used to analyze and interpret the data gathered in the study.

Research Design

This chapter contains the method of research design, the local of the study, respondents of the study, procedure, instrument used, and statistical tool.

For this research, the quantitative research method will be used in this study. As we will be using online survey to

gather data from students, quantitative research allows us to get a large number of respondents to survey and apply statistical analysis to see how significant is blended learning to the academic performance of students at Young Achievers' School of Caloocan. Researchers used this research method because numerical data making the result more efficient and reliable, by collecting data from many respondents, the findings will better represent the majority of Grade 12 Accountancy Business and Management (ABM) students that is suitable for making better conclusions. A descriptive research design will be used to measure and describe the effects of blended learning among Grade 12 Accountancy, Business and Management students on their academic performance.

The descriptive design will be appropriate for this study because it only measure and describe our variables which is our goal. A quantitative descriptive approach is a basic method to explain the events and situations exactly during their current status. By providing systematic research about phenomena, it aims to either explore the correlation between the phenomena using observations or define their attitudes (Taherdoost, 2022) ^[19]. The researchers will measure how this effects could reflect on their academic performance and describes why blended learning helps students to manage their own time. This can answer the questions of our study. Finally, the researchers may able to achieve the results that we are aiming for this study.

Locale of the Study

This study was conducted at Young Achievers' School of Caloocan, Incorporated. which is a private school located under the supervision of the Department of Education in Barangay 171, Zone 15, Bagumbong Caloocan City, Metro Manila, Philippines. The school provides pre-school, elementary, junior high and senior high school education to children in the local community. Young Achievers' School of Caloocan, Incorporated. was selected for the study as the location for its use of blended learning as part of its instructional delivery. Blended learning combines face-to-face classroom instruction with online learning and provides a good environment to assess how students view the implementation of blended learning and how the faculty is performing to the online components of the course. Blended learning will help researchers to collect relevant data from students who are in different senior high school grade levels and academic strands that meet the study's objectives.

Respondents of the Study

The students at Young Achievers School of Caloocan are chosen as a respondents of this study it is because the Students of Young Achievers School of Caloocan are the ones experiencing the blended learning setup. Combination of face to face classroom instruction with online learning, it is essential that our respondents have experience blended learning so they can provide useful information about effect on their academic performance.

Data Gathering Procedure

The data gathering procedure was started by making the survey questions for future respondents. The researcher prepared the questions that connected to the study. Each question was checked carefully so it could be assured it was clear, related to the topic, and easy to understand. After the questionnaire was completed, researchers placed it on the

Google Form so it could make it easier for the respondents and for the researcher to collect the data.

Before conducting the survey, the researchers asked permission from the school administrator. After the permission was approved, the researchers planned the schedule for visiting the selected classrooms, which are the Accountancy, Business, and Management (ABM) strands. Researchers went to each classroom and politely excused the class president. After we excused the class president, researchers introduced themselves and asked if they could gather participants from their section to participate in an online survey.

After the class president agreed. The researchers asked the Facebook of the class president so we can send to her that Google form link. After the researcher sent it to the class president, the class president then shared the survey link in their class group chat so that the students could easily open and answer the questionnaire using their phones or other devices.

Before answering the survey, the respondents were informed about the purpose of the study. Researchers said that answering the survey was voluntary, and if they don't want to answer, they can choose not to participate. The researchers also told them that all the information and answers they provided would be kept private and would only be used for the study.

The researchers selected the respondents based on the criteria of the study. The students who had attended online classes at least twice or thrice or had a previous experience with online classes before were included in the survey. We want to make sure that the respondents had enough experience to answer the question on the survey about their experience and knowledge.

After the Google Form was shared with the participants already, the researchers waited for the responses to be submitted. They always monitored and checked the responses regularly to monitor the number of participants and to make sure that enough data were collected. Once the required respondents were reached, the researchers closed the survey, reviewed the collected data, and organized the responses for data analysis.

Data Gathering Instrument

In statistics, information is often inferred about a population by studying a finite number of individuals from that population, i.e. the population is sampled, and it is assumed that characteristics of the sample are representative of the overall population. For the following, it is assumed that there is a population of individuals where some proportion, p , of the population is distinguishable from the other $1-p$ in some way; e.g., p may be the proportion of individuals who have brown hair, while the remaining $1-p$ have black, blond, red, etc. Thus, to estimate p in the population, a sample of n individuals could be taken from the population, and the sample proportion, $\hat{p}$, calculated for sampled individuals who have brown hair. Unfortunately, unless the full population is sampled, the estimate $\hat{p}$ most likely won't equal the true value p , since $\hat{p}$ suffers from sampling noise, i.e. it depends on the particular individuals that were sampled. However, sampling statistics can be used to calculate what are called confidence intervals, which are an indication of how close the estimate $\hat{p}$ is to the true value p .
Statistics of a Random Sample.

The uncertainty in a given random sample (namely that is

expected that the proportion estimate, $\hat{p}$, is a good, but not perfect, approximation for the true proportion p) can be summarized by saying that the estimate $\hat{p}$ is normally distributed with mean p and variance $p(1-p)/n$. For an explanation of why the sample estimate is normally distributed, study the Central Limit Theorem. As defined below, confidence level, confidence intervals, and sample sizes are all calculated with respect to this sampling distribution.

In short, the confidence interval gives an interval around p in which an estimate $\hat{p}$ is "likely" to be. The confidence level gives just how "likely" this is – e.g., a 95% confidence level indicates that it is expected that an estimate $\hat{p}$ lies in the confidence interval for 95% of the random samples that could be taken. The confidence interval depends on the sample size, n (the variance of the sample distribution is inversely proportional to n , meaning that the estimate gets closer to the true proportion as n increases); thus, an acceptable error rate in the estimate can also be set, called the margin of error, ϵ , and solved for the sample size required for the chosen confidence interval to be smaller than ϵ ; a calculation known as "sample size calculation."

Confidence Level The confidence level is a measure of certainty regarding how accurately a sample reflects the population being studied within a chosen confidence interval. The most commonly used confidence levels are 90%, 95%, and 99%, which each have their own corresponding z -scores (which can be found using an equation or widely available tables like the one provided below) based on the chosen confidence level. Note that using z -scores assumes that the sampling distribution is normally distributed, as described above in "Statistics of a Random Sample." Given that an experiment or survey is repeated many times, the confidence level essentially indicates the percentage of the time that the resulting interval found from repeated tests will contain the true result. Confidence Level z -score ($\pm$)

0.70	1.04	0.75	1.15
0.80	1.28	0.85	1.44
0.92	1.75	0.95	1.96
0.96	2.05	0.98	2.33
0.99	2.58	0.999	3.29
0.9999	3.89	0.99999	4.42

Confidence Interval In statistics, a confidence interval is an estimated range of likely values for a population parameter, for example, 40 ± 2 or $40 \pm 5\%$. Taking the commonly used 95% confidence level as an example, if the same population were sampled multiple times, and interval estimates made on each occasion, in approximately 95% of the cases, the true population parameter would be contained within the interval. Note that the 95% probability refers to the reliability of the estimation procedure and not to a specific interval. Once an interval is calculated, it either contains or does not contain the population parameter of interest. Some factors that affect the width of a confidence interval include: size of the sample, confidence level, and variability within the sample. There are different equations that can be used to calculate confidence intervals depending on factors such as whether the standard deviation is known or smaller samples ($n < 30$) are involved, among others. The calculator provided on this page calculates the confidence interval for a proportion and uses the following equations: confidence interval equations where z is z score $\hat{p}$ is the population proportion n and n' are sample size N is the population size Within statistics, a population is a set of events or elements that have some relevance regarding a given question or experiment. It can refer to an existing group of objects, systems, or even a hypothetical group of objects. Most

commonly, however, population is used to refer to a group of people, whether they are the number of employees in a company, number of people within a certain age group of some geographic area, or number of students in a university's library at any given time. It is important to note that the equation needs to be adjusted when considering a finite population, as shown above. The $(N-n)/(N-1)$ term in the finite population equation is referred to as the finite population correction factor, and is necessary because it cannot be assumed that all individuals in a sample are independent. For example, if the study population involves 10 people in a room with ages ranging from 1 to 100, and one of those chosen has an age of 100, the next person chosen is more likely to have a lower age. The finite population correction factor accounts for factors such as these. Refer below for an example of calculating a confidence interval with an unlimited population. EX: Given that 120 people work at Company Q, 85 of which drink coffee daily, find the 99% confidence interval of the true proportion of people who drink coffee at Company Q on a daily basis. confidence interval example Sample Size Calculation Sample size is a statistical concept that involves determining the number of observations or replicates (the repetition of an experimental condition used to estimate the variability of a phenomenon) that should be included in a statistical sample. It is an important aspect of any empirical study requiring that inferences be made about a population based on a sample. Essentially, sample sizes are used to represent parts of a population chosen for any given survey or experiment. To carry out this calculation, set the margin of error, ϵ , or the maximum distance desired for the sample estimate to deviate from the true value. To do this, use the confidence interval equation above, but set the term to the right of the $\pm$ sign equal to the margin of error, and solve for the resulting equation for sample size, n . The equation for calculating sample size is shown below. sample size equations where z is the z score ϵ is the margin of error N is the population size $\hat{p}$ is the population proportion EX: Determine the sample size necessary to estimate the proportion of people shopping at a supermarket in the U.S. that identify as vegan with 95% confidence, and a margin of error of 5%. Assume a population proportion of 0.5, and unlimited population size. Remember that z for a 95% confidence level is 1.96. Refer to the table provided in the confidence level section for z scores of a range of confidence levels. sample size example Thus, for the case above, a sample size of at least 385 people would be necessary. In the above example, some studies estimate that approximately 6% of the U.S. population identify as vegan, so rather than assuming 0.5 for $\hat{p}$, 0.06 would be used. If it was known that 40 out of 500 people that entered a particular supermarket on a given day were vegan, $\hat{p}$ would then be 0.08.

Statistical tool

The data collected from the survey questionnaire were analysed using descriptive and statistics to answer the questions of the study.

The level of Blended Learning of the Grade 12 ABM students in both traditional and online class was determined using weighted mean and standard deviation. The weighted mean was used to determine the overall level of Blended Learning while the standard deviation was used to show how close or spread out the responses were from each other.

The weighted mean formula used is:

Where:

- f = frequency of responses for each scale point
- x = numerical weight or scale value (e.g., 1–5 in Likert scale)
- N = total number of responses

The standard deviation formula used is:

Where:

- x = individual scores
- $\bar{x}$ = mean of scores
- N = number of responses

The researchers used Simple Linear Regression to predict whether blended learning has an effect to the academic performance of the students. Simple Linear Regression is a statistical tool used to determine if one variable can predict or influence another variable. It is also used to predict values of the other variable. It was proposed by Sir Francis Galton and later used and improved by Karl Pearson and other statisticians in the early 20th centuries.

The regression formula is:

Where:

- $\hat{Y}$ (Y -hat) – the predicted value of dependent variable
- a – the y-intercept
- b – the slope
- X – the value of the independent variable

Simple Linear Regression was chosen because the main purpose of the study is to find out whether blended learning has a significant effect on the academic performance of Grade 12 students. The researchers first used the Weighted Mean and Standard Deviation to determine the level of blended learning based on the responses from the survey questionnaire. After that, the results were analyzed using Simple Linear Regression to determine if blended learning can significantly predict the students' academic performance. This statistical tool is appropriate to use for the objectives of the study.

3. Results and Discussion

This chapter presents, analyzes, and interprets the data gathered from the survey questionnaires given to the respondents of the study. The findings are organized according to the statement of the problem to provide a clear and organized presentation of the results. Appropriate statistical tools were used to analyze the data and determine the respondents' perceptions and responses regarding to the research topic.

Furthermore, this chapter discusses the interpretation of the collected data based on the responses of the 28 respondents who participated in the study. The results are presented using tables and supported by corresponding discussions to provide a better understanding of the findings. The analysis aims to answer the research questions and serve as the basis for the conclusions and recommendations of the study.

1. Blended learning helps students balance and manage their own time

Table 1

Very Likely	14.3%
Likely	28.6%
Neutral	50%
Unlikely	7.1%
Very Unlikely	0%
Total	100

The data indicates that half (50.0%) of the participants did not show much opinion in regard to blended learning helping them in assigned tasks and managing time. Meanwhile, 42.9% show agreement, and only 7.1% participants disagreed with the statement, while nobody totally disagree with it.

Moreover, it indicates that there is a large number of students who do recognize the existence of blended learning impact on time management but still cannot fully rely on its success, as people may have varying study habits and arrangements.

2. I can study even when I am at home

Table 2

Very Likely	17.9%
Likely	42.9%
Neutral	32.1%
Unlikely	3.6%
Very Unlikely	3.5%
Total	100

The data show that 42.9% of the subjects either agreed or strongly agreed with the statement that they can study at home. Therefore, those who agreed and those who strongly agreed accounted for 60.8% of the replies. While neutral responses accounted for 32.1%, and only 7.1% of students stated that they disagree with the idea. It can be stated that most of the students are convinced that blended learning allows them to continue their studies controllably and enables effective studying from home.

3. Blended learning helps students balance and manage their own time

Table 3

Very Likely	25%
Likely	50%
Neutral	17.9%
Unlikely	7.1%
Very Unlikely	0%
Total	28

The majority of the respondents answered Likely or Very Likely (75%), explaining that blended learning enables students to review lessons they missed through online classes. This suggests that online resources help students to catch up on lessons even if when they are absent. Only a small amount number (7.1%) disagreed, while the 17.9%

remained neutral.

4. Blended learning helps students meet good grades in academic performance

Table 4

Very Likely	0%
Likely	39.3%
Neutral	42%
Unlikely	17.9%
Very Unlikely	0%
Total	28

Most respondents were Neutral (42.9%), while 39.3% believes blended learning helps them achieve good academic grades. This shows that although many students see some academic benefits from blended learning, a large portion are uncertain about its direct effect on their grades, 17.9% felt that blended learning does not help improve their academic performance.

5. Blended learning helps make lessons more organized and understandable

Table 5

Very Likely	3.5%
Likely	25%
Neutral	53.6%
Unlikely	17.9%
Very Unlikely	0%
Total	28

Majority of the students were undecided if the blended approach could be beneficial in structuring lessons and making them clear. They constituted 53.6% of the sample respondents. On the other hand, 28.5% of the students believed that blended learning was likely or very likely to benefit them. However, 17.9% of the students did not believe that blended learning helped structure lessons.

6. I am more confident participating in class when online

Table 6

Very Likely	14.3%
Likely	32.1%
Neutral	21.4%
Unlikely	28.6%
Very Unlikely	3.6%
Total	28

Students had some opinions regarding their participation in online classes. 46.4% indicated that they would likely or very likely participate. It is an indication that almost half of the students were comfortable with participation. 32.2% stated that they would not likely or very unlikely participate. It shows that many students remained apprehensive regarding participation in the class.

7. Students' academic performance become good than before

Table 7

Very Likely	7.1%
Likely	28.6%
Neutral	42.9%
Unlikely	21.4%
Very Unlikely	0%
Total	28

On the question of whether students are academically doing better than they have in the past, most of the respondents were Neutral (42.9%) and 35.7% answered Likely or Very Likely. It indicates that a considerable number of students experience some academic progress with the blended learning. However, 21.4% disagreed, suggesting that some students believe blended learning has negatively affected their academic performance.

8. I am more confident participating in class when online

Table 8

Very Likely	11.8%
Likely	26.9%
Neutral	34.6%
Unlikely	23.1%
Very Unlikely	3.9%
Total	28

Majority of the respondents said Neutral regarding managing their time better because of blended learning (34.6%), and (23.1%) said Unlikely. A lot of students still struggle with managing their time properly even with the blended learning set up and around 38% answered Likely or Very Likely. This might be because not everyone has good time management skills and blended learning doesn't fix that.

9. I am more confident participating in class when online

Table 9

Very Likely	10.7%
Likely	39.3%
Neutral	32.1%
Unlikely	14.3%
Very Unlikely	3.6%
Total	28

(39.3%) of the respondents said Likely, which was the highest response, meaning that there's a good number of students feel like they can join in online activities without doubting themselves. But (32.1%) were still Neutral, so there's still students who are not really sure or unsure when participating online. (14.3% and 3.6%) said they still doubt themselves during online activities.

10. I am more confident participating in class when online

Table 10

Very Likely	17.9%
Likely	42.9%
Neutral	28.6%
Unlikely	7%
Very Unlikely	3.6%
Total	28

The last question got a positive response, (42.9%) answered Likely and 17.9% answered Very Likely, so more of the class feels like they can focus better and perform well when doing blended learning. It's really good since being able to do things at your own time might help students to concentrate. Only a small part of the respondents (10%) said they couldn't focus very well.

4. Summary, Conclusions, and Recommendations

This chapter presents the summary of the key findings, conclusion and recommendation based on the effects of blended learning on academic performance of students. This study aimed to look, show, and explore how this problem could affect their academic performance.

Summary of Findings

The purpose of this study was to look for the effects of blended learning on academic performance of Grade 12 Accountancy, Business and Management (ABM) students. Based on the data gathered from 100 respondents, the following findings were revealed:

- Question No.1: Most of the participants are Very Likely (29%) regarding to "blended learning helps them to manage their time". This shows that even traditional way and blended learning were not significantly help them to adjust and manage their own time.
- Question No.2: Most of the respondents are Neutrally (17%) about "they can study at home". It illustrates that whenever face-to-face class and online class, they can study at home especially when doing their schoolworks or assignments.
- Question No. 3: Most of the participants were Neutrally (29%) agreed and disagree on blended learning allows them to review the lessons they missed through online materials. It signifies that blended learning are more flexible to meet and work for it because of the time availability.
- Question No. 4: Most of the respondents are Neutrally (36%) agree and disagree that blended learning helps them to meet the grades that they want. It highlights that blended learning are more effective than traditional way of teaching.
- Question No. 5: Most of the participants are undecided (27%) about "blended learning were beneficial in clear lessons. It simple says that even blended learning possess the teachings/lessons that is not clearly stated.
- Question No. 6: Most of the respondents were Very Likely or Likely (31%) agreed that they're more participating in online class set-up. It tells us that blended learning helps them to choose what they want to participate in.
- Question No. 7: Most of the participants are Neutrally (33%) agreed and disagree about their behavior from

the past and today. It means that their behavior doesn't affect their studying to pursue and continue of what they're started.

- Question No. 8: Most of the respondents were Likely (42.2%) managing their time better because of blended approach. It reveals that they are more likely to manage their time due to blended approach.
- Question No. 9: Most of the participants are Likely (54%) says about "the good number of students in online activities without doubts". It indicates that online class has more value than face-to-face classes.
- Question No. 10: Most of the respondents were Likely (22%) answered of "they can better focus in blended approach". It demonstrates that blended learning was significantly effective than traditional way.

Conclusions

Based on the results of this study, we conclude that blended learning has a mixed effect on the academic performance of Grade 12 ABM students at Young Achievers' School of Caloocan, Incorporated. This means that blended learning really help students in some ways, but the effect is not positive or strong in all parts of their academic performance. When analyzing our survey questionnaires and the results of the respondents answers, students gave a higher responses to the questions about studying at home, participating in class and reviewing the lessons they missed. This shows that students really do appreciate the effort and flexibility that the blended learning gives them, especially the freedom to learn at their houses and to catch up lessons whenever they need to. On the other hand, the items about time management, understanding lessons better and improving grades got mostly neutral responses. This tells us that students are not fully convinced that blended learning helps them. It is possibly because being flexible and being effective are two different things, just because a student can study anytime does not mean they will actually manage their time well or understand the lesson better. These outcomes are more likely to be influenced by the student's own habits, self-discipline and support at home rather than the blended learning model itself. This also shows that blended learning does not affect all students equally. Student learns differently, some students may say that blended learning benefits them maybe because they are independent and organized, while others may struggle, especially if they are used to relying on teachers to explain things directly. The different experience of students in blended learning is probably why the results came out neutral overall instead of having a fully positive results. It is also important to think that blended learning isn't effective on its own. It needs support and guide from the teachers, parents, and the school in order to be effective. Without proper guide, help, and support, blended learning might end up being confusing or unhelpful for some students, especially for those who doesn't benefit from blended learning and struggles to participate. Blended learning has a double sided effect on the students. It gives flexibility and control but these advantages don't necessarily mean that it improves the academic performance of the students. It shows the importance of teaching methods to different learning styles and needs. The different responses suggest that blended learning needs to be flexible enough to accommodate different learning styles. Organized students who participate in blended learning may do well with their academic

performance but those who need guidance may struggle. Understanding these differences is very important for every schools so that they can offer the right support and resources.

Blended learning works best when it is supported by a strong and supportive school system. The teachers are important to help students with their work and as a guide and provide feedback. The parents can help by creating a supportive home environment so their child would get motivated and participate better in blended learning. For this learning model to be effective, schools must ensure students have the proper technology and training. Making sure all the people have equal access to technology and resources. Some students may not benefit from blended learning because they lack access of technology. Providing equal access to technology and resources for every person would be very helpful. Inequality of access means some students may not benefit from blended learning. Schools and policymakers must work to close these gaps so that blended learning is an opportunity for all students. blended learning is a new approach of education which combines online and face to face learning. But the effectiveness of this approach is determined by the students' engagement and acceptable support by teachers, parents and educational institutions. Blended learning is an effective tool for improving academic success when there is strong support and individual needs are met.

Blended learning is not successful if it is done without any direction or assistance. Learning is largely dependent on the involvement of the teachers, the parents, the school officials and the students themselves. Teachers are involved in creating the learning activities, giving instructions, assisting and giving constructive feedback to the students. Teachers are crucial in online learning because the students need direction and clarification about some topic or concepts of the lessons that they're teaching, and both of them can give feedback on how well the student learn and how well the teachers teaching approach. Communication between the teachers and the students would be very helpful in keeping the students motivated throughout the learning process of blended learning and it will also make the-Jude student more confident in participating in online class or face-to-face because they would now believe in themselves more. It is the role of the parents to assist and support their kids in blended learning, especially since it occurs at their homes. They can help in organizing the study for the students, assisting them in their studies and motivating them to do their school works. Parental involvement is really important for the learners who struggles in terms of time management or needing some motivation and reminders to keep up with their academic performance. Where there is a parental involved on the academic performance of their children, the learner feels more responsible and motivated to do the works and also if the environment of blended learning is nice for them. The school administration is a guidance that is important for the success of blended learning programs. It is essential for the school administration to ensure that the learners and teachers have access to all the necessary technologies and resources like for example a gadget, internet access whether it's a WiFi connection or data that has a load. There should also be clear policies on scheduling, submission deadlines, and communication to prevent confusion and pressure to students in online classes or traditional education. It is important to say that the

findings of this study shows that it is students themselves that are responsible for their academic performance and also the success that they can achieve under blended learning and it is also their obligation given by the school. With the deal of learning freely in their home and the control of the teacher, the students have to be more active about participating in class, organizing their time, meeting requirements and reviewing lessons on their own. Those students who manage and set their goals, make a schedule, and reduce the distractions during study at home will benefit from the advantages of blended learning without getting stressed or burned up by its requirements. Blended learning itself is not necessarily connected with poorer academic performance. Blended learning works as a structure that relies on the students and what is affecting it. If students have self-discipline and are supported by the dedicated teachers, involved parents and effective schooling system, blended learning can help to improve their academic performance. And, the weakness or lack of these factors makes blended learning ineffective and can even contribute to problems with time management and understanding of lessons. This justifies the overall that were obtained from this study are in the range which shows that the student group understands both the strengths and weaknesses of this method of learning. Overall, this study concludes that the blended learning gives students a more flexible way of learning by combining both the face-to-face and online classes. Students have a flexibility because this combines doing works in school and their house, which means they have a much more time to work on things in their academic performance, but it doesn't mean that it is going to improve their academic performance. For blended learning to be truly effective, it needs the active effort of the students with the support from their teachers, parents, and the school.

Recommendation

For School and Administrators: Strengthen the blended learning setup so students can adjust and adapt through it over time especially in the online learning approach. Using advanced apps or websites that are made for online learning but are still easily accessed by every student so that students and teachers can both be focused and learn properly without hassle, since having the right set of tools can help them easily adjust and adapt through it over time.

For Teachers: Continue to create a schedule and deadlines that students can follow so that they can manage their time well and send the lessons that have been discussed for the students to be able to review their missed lessons. Continue to create a well-planned schedule and deadlines that students can easily follow so that they can manage their time well and are able to send needed assignments or projects on time, and also send all the lessons that have been discussed so that it will be easily accessible for students who missed a lesson and can still follow along.

For Parents: Make sure your child has a healthy environment inside their home so they can perform well without distractions in an online learning setup. It is necessary for parents to take care of their children's educational progress, as well as assist their children with learning.

For Students: Make sure to comply with activities on time and review your lessons well, this will help with the students' grade to be better and aim for much greater results than their usual performance in their academics.

For Future Researchers: Include other strands in your research, determine what other aspects that may affect academic performance and how it is relevant. Include other strands in your research, determine what other aspects that may affect academic performance and how it is relevant.

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6. References

1. Abdissa Dinkissa, *et al.* The Effect of Blended Learning Educational Model on Secondary School Students' Mathematics Achievement, 2025. <https://files.eric.ed.gov/fulltext/EJ1499515.pdf>
2. ALrasheedy Benayan, *et al.* The effect of blended learning on enhancing motivation for academic achievement in students in the faculties of humanity sciences at hail university, 2025.
3. Ashraf MA, Mollah S, Perveen S, Shabnam N, Nahar L. Pedagogical applications, prospects, and challenges of blended learning in Chinese higher education, 2022.
4. Bond. Blended Learning is considered the most effective and most popular mode of instruction adopted by educational institutions due to its perceived effectiveness in providing flexible, timely and continuous learning, 2021. <https://eera-ecer.de/ecer-programmes/conference/28/contribution/55571>
5. Cajucom E, Lopez IN, Valdez J, Villanueva J, Balonquita W, Sondag JA. Readiness in adopting a blended learning approach in science: Challenges encountered and breakthroughs, 2022. <https://ejournals.ph/article.php?i>
6. Cao W. A meta-analysis of effects of blended learning on performance, attitude, achievement, and engagement across different countries, 2023.
7. Chen, Jumaat. Studies have suggested that while blended learning offers increased flexibility and accessibility, its effectiveness ultimately depends on sound pedagogical integration and learner readiness, 2023. <https://files.eric.ed.gov/fulltext/EJ1499515.pdf>
8. Duon Hu, Bui P Uyen, Lu Kim. The effectiveness of blended learning on students' academic achievement, self-study skills and learning attitudes: A quasi-experiment study in teaching the conventions for coordinates in the plane, 2022. [https://www.cell.com/heliyon/fulltext/S2405-8440\(22\)03](https://www.cell.com/heliyon/fulltext/S2405-8440(22)03)
9. Garcia Shiela. Blended Learning Education: The Effectiveness of New Ways of Teaching and Learning in Enhancing Students' Academic Achievement, 2022. <https://ejournals.ph/article.php?id=20865>
10. Gingoyon E. Implementation of blended learning modality: An evaluation based on ABCD model. CNU Journal of Higher Education, 2023. Doi: <https://doi.org/10.58887/cnu-jhe.v17i1.285>
11. Huerto MJ. Assessment of blended learning implementation and student's academic performance toward enhanced instructional policy. Psychology and Education, 2024. Doi: <https://doi.org/10.5281/zenodo.11568189>
12. Khan B, *et al.* The impact of blended learning on student performance. ideas.repec.org, 2024. <https://ideas.repec.org/a/adx/jessjr/v5y2024i2p360-371.html>
13. Li S, Wang W. Effect of blended learning on student performance in K-12 settings, 2022.
14. Li, Yu Q, Yang F. The effect of blended instruction on student performance, 2022.
15. Min W, Yu Z. A systematic review of critical success factors in blended learning. Education Sciences, 2023.
16. Nuezca AP, Pelarca RB, Malicia JC. Students' Perception and Learning Environment on their Level of Engagement in Blended Learning Modality, 2024. <https://ejournals.ph/article.php?id=24171>
17. Peng Z, Raman A. Systematic Literature Review on the Effects of Blended Learning in EFL Education. Contemporary Educational Technology. 2026; 18(1). <https://files.eric.ed.gov/fulltext/EJ1499515.px>
18. Tabassum Bushra, *et al.* The Impact of Blended Learning on Student Performance, 2024. <https://ideas.repec.org/a/adx/jessjr/v5y2024i2p360-371.html>
19. Taherdoost H. What are different research approaches? Comprehensive review of qualitative, quantitative, and mixed method research, their applications, types, and limitations, 2022.
20. Vilo AME, Taha HS. Effectiveness on the use of blended learning approach (BLA): Its implications on the students' performance. International Journal of Multidisciplinary, 2023. <https://www.ejournal>
21. Yu Z, Xu W, Sukjairungwattana P. Meta-analyses of differences in blended and traditional learning outcomes and students' attitudes. Frontiers in Psychology. 2022c; 13:926947. Doi: <https://doi.org/10.3389/fpsyg.2022.926947>