International Journal of Education Humanities and Social Science

ISSN: 2582-0745
Vol. 7, No. 01; 2024

TECHNOLOGY-AIDED INSTRUCTION AS PERCEIVED BY INDIGENOUS LEARNERS AND THEIR ACADEMIC PERFORMANCE: BASES FOR IMPLEMENTING ENHANCED TECHNOLOGY-BASED TEACHING INSTRUCTION

Ariette Joanna Lacuesta Cabling[1]
[1] Cadmang Elementary School, Cabangan, Zambales, Philippines
[1]Mondriaan Aura College, Subic Bay Freeport Zone, Philippines

https://doi.org/10.54922/IJEHSS.2024.0649

ABSTRACT

This study determined the impact of technology-aided instruction (TAI) on academic performance among 126 indigenous learners in Cabangan District, Schools Division of Zambales during the School Year 2023-2024. Employing a quantitative descriptive design and a researcher-developed questionnaire, data collected formed the bases for an enhanced instructional plan geared towards technology-based teaching to improve academic outcomes. Findings revealed that most indigenous learners, aged 11, predominantly female, with families earning P19,999 or less monthly, and spent less than an hour studying at home. Learners, guided by high school graduates, showed positive outcomes, demonstrating engagement, access to resources, individualized pacing, and real-world skills development. Notably, they exhibited very satisfactory academic performance in written works, performance tasks, and quarterly assessments. Perceptions of TAI significantly differed among indigenous learners based on age, monthly family income, and learning facilitators' educational attainment, with a rejection of the null hypothesis. A low yet positive correlation linked learners' perceptions of TAI with academic performance in written works and quarterly assessments, leading to the null hypothesis rejection. An enhanced instructional plan is proposed to implement technology-based teaching, aiming to boost academic performance. Recommendations included sustained learner engagement, active participation, access to resources, and mastery of real-world skills. Institutions are advised to ensure continued access to TAI, implement regular assessments and feedback mechanisms, and offer tailored programs addressing individual needs. Learners are encouraged to recognize the positive correlation between their perceptions of TAI and academic performance. Educational institutions should foster an environment encouraging positive perceptions, emphasizing learning engagement, resource access, individualized pacing, and real-world skills development. Active learner participation in the instructional plan, with continuous feedback and adaptability, promises refinement over time.

Keywords: Technology-Aided Instruction (TAI), Indigenous Learners, Academic Performance.

1. INTRODUCTION

Despite facing distinct challenges in traditional education systems, indigenous learners can find promising prospects for academic success through TAI [1]. However, unlocking this potential requires a culturally responsive approach that capitalizes on their strengths and addresses their specific needs [2,3].

Research underlines the benefits of TAI, including increased learner engagement and motivation [4], improved performance across various subjects [5,6], access to self-learning and

ISSN: 2582-0745
Vol. 7, No. 01; 2024

flipped classroom methodologies [7], and development of research and project-based learning skills [8]. However, potential drawbacks associated with TAI, such as overreliance on technology and negative impacts on fine motor development and problem-solving, necessitate cautious implementation [9]. Additionally, proper teacher training, consideration of individual teaching approaches, and addressing learner needs are crucial for success [9,10]. The digital divide and unequal access to technology and resources further complicate the equation, highlighting the need for inclusive strategies [7].

Building strong teacher-learner relationships [11], utilizing innovative approaches for online learning [12], combining academic and emotional support [13], and effectively employing blended learning and emergency remote teaching [14] all emerge as key strategies for fostering engagement. The COVID-19 pandemic further emphasized the importance of effective instructional materials, diverse teaching methodologies [15,16], and ensuring equity, accessibility, and open educational resources [17].

Successful TAI models like blended learning strategies [18], fully online flipped classes using videoconferencing [19], the Modern Classroom approach [20], and self-paced mastery-based instruction [21] demonstrate the potential of this approach. However, it's crucial to remember that each indigenous community has unique needs and contexts. Ongoing evaluation and feedback are essential to ensure culturally appropriate and effective implementation of TAI, ultimately creating inclusive and engaging learning environments that empower indigenous learners to thrive [22].

2. STATEMENT OF THE PROBLEM

This study focused on examining the TAI on indigenous learners' academic performance in Cabangan District, Schools Division of Zambales during the School Year 2023-2024.

Specifically, it aimed to answer these questions:

1. How may the profile of respondents be described in terms of:
    1.1. age;
    1.2. sex;
    1.3. monthly family income;
    1.4. number of hours spent in studying at home per day; and
    1.5. highest educational attainment of the learning facilitator?
2. How do respondents perceive the TAI in terms of:
    2.1. learning engagement;
    2.2. access to learning materials and resources;
    2.3. individualized pace and mastery; and
    2.4. real-world skills development?
3. How may the academic performance of respondents be described in terms of:
    3.1. written works;
    3.2. performance tasks; and
    3.3. quarterly assessment?
4. Is there a significant difference between the perceptions of respondents on the TAI when grouped according to their profile?
5. Is there a significant correlation between the perceptions of respondents on the TAI and their academic performance?
6. What instructional plan can be proposed to implement technology-based teaching towards the improvement of academic performance of indigenous learners?

ISSN: 2582-0745
Vol. 7, No. 01; 2024

3. METHODS AND MATERIALS

Since the study focused on the TAI as perceived by indigenous learners and academic performance in Cabangan District, Schools Division of Zambales during the School Year 2023-2024 wherein data were collected, classified, summarized, presented in percentages, and means, the quantitative descriptive method of research was the most appropriate method used.

This study utilized a researcher-made questionnaire to gather the necessary data, ensuring that the specific research objectives and variables were effectively captured and measured. By creating a questionnaire tailored to the study's purpose, the researcher designed and included questions that directly aligned with the research questions, objectives, and variables being investigated.

The questionnaire consisted of three parts. Part I encompassed respondents' profile, including age, sex, monthly family income, number of hours spent studying at home per day, and the highest educational attainment of the learning facilitator. Part II examined the TAI as perceived by respondents, covering aspects such as learning engagement, access to learning materials and resources, individualized pace and mastery, and real-world skills development. Lastly, Part III centered on the academic performance of respondents, evaluating written works, performance tasks, and quarterly assessment.

The calculated significance values for perceptions of TAI across various dimensions—such as learning engagement, access to learning materials and resources, individualized pace and mastery, and real-world skills development—are all below the 0.05 level of significance (KS = 0.000, 0.000, 0.000, 0.000, respectively; SW = 0.001, 0.001, 0.001, 0.001, respectively), indicating a non-normal distribution. Consequently, non-parametric testing, specifically the Kruskal-Wallis Test, was employed to assess perceptions of TAI. Likewise, the calculated significance values for academic performance, including written work, performance tasks, and quarterly assessments (KS = 0.000, 0.000, 0.003, respectively; SW = 0.001, 0.001, 0.001, respectively), all fall below the 0.05 level of significance, suggesting a non-normal distribution. Therefore, the non-parametric test, namely the Kruskal-Wallis Test, was utilized to assess academic performance.

4. RESULTS AND DISCUSSIONS

Respondents of the study consisted of 126 indigenous learners in Cabangan District, Schools Division of Zambales during the School Year 2023-2024. They were distributed among five public elementary schools, as shown in Table 1. Specifically, the indigenous learners were enrolled in Cadmang Elementary School, Reserva Elementary School, San Juan Elementary School, San Juan Elementary School Annex, and Sapangbato Elementary School. All of these indigenous learners were in Grade 5 at the time of the study.

Table 1. Distribution of Respondents by School

School	Frequency	Percentage
Cadmang Elementary School	28	22.22
Reserva Elementary School	21	16.67
San Juan Elementary School	32	25.40
San Juan Elementary School Annex	18	14.29
Sapangbato Elementary School	27	21.43
Total	**126**	**100.00**

ISSN: 2582-0745
Vol. 7, No. 01; 2024

4.1. Profile Of The Respondents

Table 2 details the distribution of respondents' age profile, including both frequency and percentage. According to the table, 42 (33.33%) indigenous learners were 11 years old, 36 (28.57%) indigenous learners were 12 years old, 30 (23.81%) indigenous learners were 13 years old, and 18 (14.29%) indigenous learners were 14 years old. The mean age of respondents was 12.19 years old.

Table 2. Frequency and Percentage Distribution of the Profile of Respondents in terms of Age

Age	Frequency	Percentage
14 years old	18	14.29
13 years old	30	23.81
12 years old	36	28.57
11 years old	42	33.33
Total	**126**	**100.00**
Mean	**12.19 years old**	

The findings of the previous studies [23,24,25] were parallel with the findings of the current study regarding the demographic focus on a specific age group within the learner population in Zambales. This suggests that the research targeted individuals around 11 years old, providing valuable insights into the characteristics, behaviors, or educational outcomes of this particular age cohort in the context of the studies.

Regarding sex, Table 3 displays the frequency and percentage distribution of respondents' profile. It is observable that a majority (50.79%) of the indigenous learners were female and 62 (49.21%) were male.

Table 3. Frequency and Percentage Distribution of the Profile of Respondents in terms of Sex

Sex	Frequency	Percentage
Male	62	49.21
Female	64	50.79
Total	**126**	**100.00**

The findings of the previous studies [26,27,28] were parallel with the findings of the current study concerning the notable gender distribution among the learners, with a predominant representation of females in Zambales. This observation suggests that the studies may have explored gender-related aspects, such as learning patterns, preferences, or challenges, within the context of the educational environment in Zambales during the specified timeframe. Further analysis of the findings could provide valuable insights into the experiences and dynamics of female learners in the region during the period covered by the studies.

Table 4 outlines the monthly family income profile of respondents, illustrating the frequency and percentage distribution. The data on the table shows that 34 (26.98%) indigenous learners belonged to a family with a monthly income of P19,999 and below, 29 (23.02%) indigenous learners belonged to a family with a monthly income of P20,000 to P39,999, 25 (19.84%) indigenous learners belonged to a family with a monthly income of P40,000 to P59,999, 15 (11.90%) indigenous learners belonged to a family with a monthly income of P60,000 to P79,999, 14 (11.11%) indigenous learners belonged to a family with a monthly income of P80,000 to P99,999, 5 (3.97%) indigenous learners belonged to a family with a monthly income of

ISSN: 2582-0745
Vol. 7, No. 01; 2024

P100,000 to P119,999, and 4 (3.17%) indigenous learners belonged to a family with a monthly income of P120,000 and above. The mean monthly family income of respondents was P46,348.71.

Table 4. Frequency and Percentage Distribution of the Profile of Respondents in terms of Monthly Family Income

Monthly Family Income	Frequency	Percentage
P120,000 and above	4	3.17
P100,000 to P119,999	5	3.97
P80,000 to P99,999	14	11.11
P60,000 to P79,999	15	11.90
P40,000 to P59,999	25	19.84
P20,000 to P39,999	29	23.02
P19,999 and below	34	26.98
Total	**126**	**100.00**
Mean	**P46,348.71**	

The findings of the previous studies [29,30,31] were parallel with the findings of the current study regarding the significant association between the learners and lower monthly family incomes in Zambales. Specifically, the findings indicated that the majority of the participants came from families with a monthly income of P19,999 and below. This socioeconomic insight suggests that the studies may have focused on understanding the educational challenges, opportunities, or outcomes for learners from economically disadvantaged backgrounds. The data could potentially contribute to discussions on the impact of income levels on access to education, academic performance, and the overall well-being of learners in Zambales.

Table 5 encapsulates the distribution of the number of hours spent studying at home per day profile among respondents, presenting both frequency and distribution. The table indicates that 36 (28.57%) indigenous learners spent less than 1.0 hour studying at home per day, 27 (21.43%) indigenous learners spent 1.0 to 1.9 hours studying at home per day, 24 (19.05%) indigenous learners spent 2.0 to 2.9 hours studying at home per day, 20 (15.87%) indigenous learners spent 3.0 to 3.9 hours studying at home per day, and 19 (15.08%) indigenous learners spent 4.0 hours and above studying at home per day. The mean number of hours spent studying at home per day by respondents was 2.12 hours.

Table 5. Frequency and Percentage Distribution of the Profile of Respondents in terms of Number of Hours Spent Studying at Home per Day

Number of Hours Spent Studying at Home per Day	Frequency	Percentage
4.0 hours and above	19	15.08
3.0 to 3.9 hours	20	15.87
2.0 to 2.9 hours	24	19.05
1.0 to 1.9 hours	27	21.43
less than 1.0 hour	36	28.57
Total	**126**	**100.00**
Mean	**2.12 hours**	

The findings of the previous studies [32,33,34] were parallel with the findings of the current study in uncovering a noteworthy pattern among the learners in Zambales, revealing that the majority of them spent less than 1.0 hour studying their lessons at home per day. This finding

ISSN: 2582-0745
Vol. 7, No. 01; 2024

suggests a potential area of interest within the studies, such as investigating the impact of study habits or time allocation on academic performance. The information could be indicative of the studies' focus on understanding the learning behaviors, time management practices, and potential challenges faced by learners in Zambales in relation to their home study routines.

Table 6 breaks down respondents' highest educational attainment of their learning facilitators through frequency and percentage. The table reveals that 37 (29.37%) learning facilitators were high school graduates, 31 (24.60%) learning facilitators were college graduates, 29 (23.01%) learning facilitators were elementary graduates, 18 (14.29%) learning facilitators were elementary undergraduates, 8 (6.35%) learning facilitators were MA graduates, 2 (1.59%) learning facilitators did not attend schooling, and 1 (0.79%) learning facilitator was an EdD/PhD/DPA graduate.

Table 6. Frequency and Percentage Distribution of the Profile of Respondents in terms of Highest Educational Attainment of the Learning Facilitator

Highest Educational Attainment of the Learning Facilitators	Frequency	Percentage
EdD/PhD/DPA Graduate	1	0.79
MA Graduate	8	6.35
College Graduate	31	24.60
High School Graduate	37	29.37
Elementary Graduate	29	23.01
Elementary Undergraduate	18	14.29
Did Not Attend Schooling	2	1.59
Total	**126**	**100.00**

The findings of the previous studies [35,36,37] were parallel with the findings of the current study in uncovering a prevalent characteristic among the learners' learning facilitators in Zambales, indicating that a significant portion of them were high school graduates. This particular detail suggests that the studies may have explored the role and impact of learning facilitators with varying educational backgrounds on the academic experiences and outcomes of the learners. The findings could provide valuable insights into the effectiveness of high school graduates as learning facilitators and their influence on the educational development of learners in Zambales during the specified period.

4.2. Tai As Perceived By Respondents

In Table 7, the mean ratings and interpretations of respondents' perceived TAI are summarized in terms of learning engagement. The table illustrates that respondents observed TAI to be more enjoyable and exciting ($\mu = 3.16$), easier to understand with technology ($\mu = 3.19$), more interesting with devices like tablets and computers ($\mu = 3.18$), more interactive and engaging ($\mu = 3.15$), more colorful and visual ($\mu = 3.13$), more hands-on and practical with educational apps and programs ($\mu = 3.13$), more personalized and tailored to individual needs ($\mu = 3.17$), more memorable and effective for information retention ($\mu = 3.15$), more creative and expressive ($\mu = 3.21$), and more collaborative, allowing teamwork ($\mu = 3.19$). The general mean rating for learning engagement was 3.17, interpreted as observed.

ISSN: 2582-0745
Vol. 7, No. 01; 2024

Table 7. Mean Rating and Interpretations of the TAI as Perceived by Respondents in terms of Learning Engagement

Item	Descriptor	Mean Rating	Interpretation
1	Instruction is more fun and exciting when technology is used.	3.16	Observed
2	Instruction is easier to understand with the help of technology.	3.19	Observed
3	Instruction is more interesting when I can use devices like tablets and computers.	3.18	Observed
4	Instruction is more interactive and engaging with technology.	3.15	Observed
5	Instruction is more colorful and visual with the use of technology.	3.13	Observed
6	Instruction is more hands-on and practical when I can use educational apps and programs.	3.13	Observed
7	Instruction is more personalized and tailored to my individual needs with technology.	3.17	Observed
8	Instruction is more memorable and helps me remember information better when technology is involved.	3.15	Observed
9	Instruction is more creative and allows me to express my ideas in different ways using technology.	3.21	Observed
10	Instruction is more collaborative and allows me to work together with my classmates by using technology.	3.19	Observed
General Mean Rating		**3.17**	**Observed**

The findings of the previous studies [38,39,40] were parallel with the findings of the current study in underscoring the multifaceted relationship between technology-aided instruction and learner engagement. While personalized learning and game-based approaches show promise, the choice of technology tools and their alignment with the specific context and discipline play crucial roles in shaping the effectiveness of technology in enhancing learner engagement in education.

In Table 8, the mean ratings and interpretations of perceived TAI are outlined concerning access to learning materials and resources. Respondents observed TAI to be helpful for easy access to information online ($\mu = 3.17$), important for accessing a variety of books, videos, and educational websites ($\mu = 3.21$), beneficial for exploring different topics and learning new things ($\mu = 3.15$), powerful for searching answers and gaining new knowledge ($\mu = 3.17$), significant for providing enjoyable educational games and activities ($\mu = 3.11$), valuable for learning from experts through online tutorials and videos ($\mu = 3.18$), meaningful for accessing educational apps for practice and skill improvement ($\mu = 3.14$), advantageous for digital libraries and reading materials anytime ($\mu = 3.14$), impactful for learning about different cultures through virtual tours ($\mu = 3.18$),

ISSN: 2582-0745
Vol. 7, No. 01; 2024

and transformative for empowering self-paced learning (μ = 3.17). The general mean rating for access to learning materials and resources was 3.16, interpreted as observed.

Table 8. Mean Rating and Interpretations of the TAI as Perceived by Respondents in terms of Access to Learning Materials and Resources

Item	Descriptor	Mean Rating	Interpretation
1	Instruction is helpful because it allows me to easily find information and resources online.	3.17	Observed
2	Instruction is important because it gives me access to a wide variety of books, videos, and educational websites.	3.21	Observed
3	Instruction is beneficial because it enables me to explore different topics and learn new things.	3.15	Observed
4	Instruction is powerful because it allows me to search for answers to my questions and discover new knowledge.	3.17	Observed
5	Instruction is significant because it provides me with educational games and activities that make learning enjoyable.	3.11	Observed
6	Instruction is valuable because it gives me the opportunity to learn from experts through online tutorials and videos.	3.18	Observed
7	Instruction is meaningful because it allows me to access educational apps that help me practice and improve my skills.	3.14	Observed
8	Instruction is advantageous because it provides me with digital libraries where I can read books and stories anytime.	3.14	Observed
9	Instruction is impactful because it gives me the chance to learn about different cultures and places through virtual tours and videos.	3.18	Observed
10	Instruction is transformative because it empowers me to learn at my own pace and explore subjects that interest me.	3.17	Observed
General Mean Rating		**3.16**	**Observed**

The findings of the previous studies [41,42,43] were parallel with the findings of the current study in collectively indicating a positive correlation between technology-aided instruction and enhanced access to learning materials and resources. The growth in publications, positive perceptions among faculty, and the effectiveness of multimedia tools underscore the potential of technology to bridge educational gaps and provide diverse learning opportunities for learners.

Table 9 presents the mean ratings and interpretations of perceived TAI in terms of individual pace and mastery. Respondents observed TAI to be important for learning at their own speed and understanding concepts better (μ = 3.15), helpful for practicing and mastering

ISSN: 2582-0745
Vol. 7, No. 01; 2024

challenging skills (μ = 3.17), empowering for choosing activities matching interests and abilities (μ = 3.19), impactful for building confidence and achieving personal goals (μ = 3.14), significant for providing personalized feedback and guidance (μ = 3.17), valuable for reviewing lessons as needed (μ = 3.21), transformative for taking ownership of learning and becoming independent learners (μ = 3.12), meaningful for setting learning goals and tracking progress (μ = 3.14), advantageous for developing problem-solving skills and critical thinking (μ = 3.19), and beneficial for supporting individual learning styles and preferences (μ = 3.19). The general mean rating for individualized pace and mastery was 3.17, interpreted as observed.

Table 9. Mean Rating and Interpretations of the TAI as Perceived by Respondents in terms of Individualized Pace and Mastery

Item	Descriptor	Mean Rating	Interpretation
1	Instruction is important because it allows me to learn at my own speed and understand concepts better.	3.15	Observed
2	Instruction is helpful because it gives me the opportunity to practice and master skills that I find challenging.	3.17	Observed
3	Instruction is empowering because it lets me choose activities and lessons that match my interests and abilities.	3.19	Observed
4	Instruction is impactful because it helps me become more confident in my learning and achieve personal goals.	3.14	Observed
5	Instruction is significant because it provides personalized feedback and guidance to help me improve my performance.	3.17	Observed
6	Instruction is valuable because it allows me to review and revisit lessons as many times as I need until I fully understand them.	3.21	Observed
7	Instruction is transformative because it enables me to take ownership of my learning and become an independent learner.	3.12	Observed
8	Instruction is meaningful because it allows me to set my own learning goals and track my progress.	3.14	Observed
9	Instruction is advantageous because it helps me develop problem-solving skills and critical thinking abilities.	3.19	Observed
10	Instruction is beneficial because it supports my individual learning styles and preferences.	3.19	Observed
General Mean Rating		**3.17**	**Observed**

The findings of the previous studies [44,45,46] were parallel with the findings of the current study in collectively underscoring the importance of technology in shaping instructional

ISSN: 2582-0745
Vol. 7, No. 01; 2024

methods and individualized paced and mastery. From personalized learning in the U.S. to the rapid adoption of online teaching in India and Romania, technology plays a pivotal role in adapting educational approaches, overcoming challenges, and potentially improving academic outcomes.

Table 10 outlines the mean ratings and interpretations of perceived TAI in terms of real-world skills development. Respondents observed TAI to be important for teaching them to use technology for real-world problem-solving (μ = 3.18), engaging for exploring different cultures through virtual field trips (μ = 3.16), impactful for developing skills like communication, collaboration, and creativity (μ = 3.17), relevant for using technology to research and gather information (μ = 3.14), empowering for creating digital projects and presentations (μ = 3.19), valuable for understanding technology's role in various professions and industries (μ = 3.17), interactive for participating in online discussions and sharing ideas (μ = 3.17), meaningful for developing digital literacy crucial in today's world (μ = 3.18), practical for using technology to solve everyday problems (μ = 3.16), and beneficial for preparing them for careers requiring technology skills (μ = 3.19). The general mean rating for real-world skills development was 3.17, interpreted as observed.

Table 10. Mean Rating and Interpretations of the TAI as Perceived by Respondents in terms of Real-World Experiences

Item	Descriptor	Mean Rating	Interpretation
1	Instruction is important because it teaches me how to use technology to solve real-word problems.	3.18	Observed
2	Instruction is engaging because it allows me to explore and learn about different cultures and places through virtual field trips.	3.16	Observed
3	Instruction is impactful because it helps me develop important skills like communication, collaboration, and creativity.	3.17	Observed
4	Instruction is relevant because it shows me how to use technology to research and gather information about topics I am interested in.	3.14	Observed
5	Instruction is empowering because it gives me the tools and knowledge to create digital projects and presentations.	3.19	Observed
6	Instruction is valuable because it helps me understand how technology is used in different professions and industries.	3.17	Observed
7	Instruction is interactive because it allows me to participate in online discussions and share my ideas with others.	3.17	Observed
8	Instruction is meaningful because it helps me develop digital literacy skills that are important in today's world.	3.18	Observed

ISSN: 2582-0745
Vol. 7, No. 01; 2024

9	Instruction is practical because it teaches me how to use technology to solve everyday problems and make my life easier.	3.16	Observed
10	Instruction is beneficial because it prepares me for future careers that may require technology skills.	3.19	Observed
General Mean Rating		**3.17**	**Observed**

The findings of the previous studies [47,48,49] were parallel with the findings of the current study in collectively underscoring the potential of technology-aided instruction in fostering real-world skills development among learners. From enhancing instructional practices in Pakistan to offering promising TPD approaches in low- and middle-income countries and leveraging AR technology for improved achievement and attitudes in science education, these studies showcase the diverse ways technology can positively impact learners' skills and attitudes towards learning.

4.3. Academic Performance

Table 11 encapsulates the distribution of written works performance among respondents, presenting both frequency and distribution. The table indicates that 44 (34.92%) indigenous learners attained a performance of 85 to 89, 32 (25.40%) indigenous learners attained a performance of 80 to 84, 26 (20.63%) indigenous learners attained a performance of 90 and above, and 24 (19.05%) indigenous learners attained a performance of 75 to 79. The mean academic performance of respondents was 84.86 or 85, interpreted as very satisfactory.

Table 11. Frequency and Percentage Distribution of the Academic Performance of Respondents in terms of Written Works

Written Works	Frequency	Percentage
90 and above	26	20.63
85 to 89	44	34.92
80 to 84	32	25.40
75 to 79	24	19.05
Total	**126**	**100.00**
Mean	**84.86 or 85**	
Interpretations	**Very Satisfactory**	

The findings of the previous studies [50,51,52] were parallel with the findings of the current study in collectively emphasizing the importance of written works in assessing and enhancing learners' academic performance, whether in traditional face-to-face, online distance learning, or blended learning modalities. They underscore the need for teachers to adapt and design effective written assignments to support learners' learning and achievement in diverse educational settings.

Table 12 details the distribution of respondents' performance tasks performance, including both frequency and percentage. According to the table, 49 (38.89%) indigenous learners had a performance of 90 and above, 45 (35.71%) indigenous learners had a performance of 85 to 89, 18 (14.29%) indigenous learners had a performance of 80 to 84, and 14 (11.11%) indigenous learners had a performance of 75 to 79. The mean academic performance of respondents was 87.12 or 87, interpreted as very satisfactory.

ISSN: 2582-0745
Vol. 7, No. 01; 2024

Table 12. Frequency and Percentage Distribution of the Academic Performance of Respondents in terms of Performance Tasks

Performance Tasks	Frequency	Percentage
90 and above	49	38.89
85 to 89	45	35.71
80 to 84	18	14.29
75 to 79	14	11.11
Total	**126**	**100.00**
Mean	**87.12 or 87**	
Interpretations	**Very Satisfactory**	

The findings of the previous studies [53,54,55] were parallel with the findings of the current study in contributing to understanding the multifaceted nature of academic performance, with factors such as holistic support, technological integration for online learning, and the impact of regular task completion playing vital roles. The findings can guide teachers in developing strategies to enhance performance tasks and overall academic success in various educational settings.

In terms of quarterly assessment, Table 13 displays the frequency and distribution of respondents' performance. It is observable that 48 (38.10%) indigenous learners obtained a performance of 85 to 89, 32 (25.40%) indigenous learners obtained a performance of 90 and above, 26 (20.63%) indigenous learners obtained a performance of 80 to 84, and 20 (15.87%) indigenous learners obtained a performance of 75 to 79. The mean academic performance of respondents was 85.65 or 86, interpreted as very satisfactory.

Table 13. Frequency and Percentage Distribution of the Academic Performance of Respondents in terms of Quarterly Grade

Quarterly Assessment	Frequency	Percentage
90 and above	32	25.40
85 to 89	48	38.10
80 to 84	26	20.63
75 to 79	20	15.87
Total	**126**	**100.00**
Mean	**85.65 or 86**	
Interpretations	**Very Satisfactory**	

The findings of the previous studies [56,57,58] were parallel with the findings of the current study in highlighting the complex interplay between various factors, including social media addiction, performance-based assessment, stress, motivation, and their impact on academic performance. While not all explicitly mention quarterly assessment, the findings suggest that learners' ability to manage time, engage in active assessments, and maintain positive psychological well-being can significantly influence their success in academic tasks, including quarterly assessments. Teachers and institutions can use these insights to design interventions and strategies that foster a conducive environment for effective learning and task engagement.

4.4. Difference Between The Perceptions Of Respondents On Tai And Their Profile

In Table 14, a Kruskal-Wallis Test is utilized to examine the differences in perceptions of respondents regarding TAI across different age profile. The computed asymptotic significance

ISSN: 2582-0745
Vol. 7, No. 01; 2024

values for dimensions such as learning engagement, access to learning materials and resources, individualized pace and mastery, and real-world skills development (ASig. = 0.024, 0.004, 0.011, 0.018, respectively) are all below the 0.05 significance level. Consequently, the null hypothesis is rejected, indicating a significant difference between respondents' perceptions of TAI and their age profile. The overall computed value is ASig. = 0.017.

Table 14. Difference Between the Perceptions of Respondents in TAI and Their Profile in terms of Age

Perceptions in TAI	H-value	df	Asymp. Sig.	Decision
Learning Engagement	9.435	3	.024	Reject H_{01} Significant
Access to Learning Materials and Resources	13.258	3	.004	Reject H_{01} Significant
Individualized Pace and Mastery	11.141	3	.011	Reject H_{01} Significant
Real-World Skills Development	10.022	3	.018	Reject H_{01} Significant
Overall	**10.255**	**3**	**.017**	**Reject H_{01} Significant**

The findings of the previous studies [59,60,61] were parallel with the findings of the current study in collectively highlighting the nuanced relationship between age, attitudes towards technology, and the integration of technology in educational settings. While mature learners may differ in their technology usage patterns compared to younger learners, attitudes towards technology might be more consistent across age groups. Additionally, teachers' practices and the integration of technology can vary based on subject-specific contexts, emphasizing the need for targeted approaches in professional development and instructional design.

In Table 15, the outcomes of a Kruskal-Wallis Test explore the differences in perceptions of respondents regarding TAI based on their sex profile. The computed asymptotic significant values for dimensions like learning engagement, access to learning materials and resources, individualized pace and mastery, and real-world skills development (ASig. = 0.212, 0.286, 0.213, 0.302, respectively) all exceed the 0.05 significance threshold. Consequently, the null hypothesis is accepted, suggesting no significant difference between respondents' sex profile and their perceptions of TAI. The overall computed value is ASig. = 0.289.

ISSN: 2582-0745
Vol. 7, No. 01; 2024

Table 15. Difference Between the Perceptions of Respondents in TAI and Their Profile in terms of Sex

Perceptions in TAI	H-value	df	Asymp. Sig.	Decision
Learning Engagement	1.555	1	.212	Accept H_{01} Not Significant
Access to Learning Materials and Resources	1.137	1	.286	Accept H_{01} Not Significant
Individualized Pace and Mastery	1.553	1	.213	Accept H_{01} Not Significant
Real-World Skills Development	1.064	1	.302	Accept H_{01} Not Significant
Overall	**1.126**	**1**	**.289**	**Accept H_{01} Not Significant**

The findings of the previous studies [62,63,64] were parallel with the findings of the current study in highlighting the broader implications of gender in the context of technology-aided instruction and learning. While direct findings on gender differences are limited in these studies, they underscore the importance of considering individual characteristics, educational levels, personality traits, and professional development when examining the intersection of gender and technology in education. Future research could delve deeper into these intersections to provide a more nuanced understanding of the role of gender in shaping technology-aided instruction outcomes.

Table 16 displays the results of a Kruskal-Wallis Test examining differences in perceptions of respondents regarding TAI based on their monthly family income profile. The computed asymptotic significant values for dimensions, including learning engagement, access to learning materials and resources, individualized pace and mastery, and real-world skills development, all fall below the significance level of 0.05 (ASig. = 0.020, 0.048, 0.049, 0.031, respectively). As a result, the null hypothesis is rejected, indicating a significant difference between respondents' perceptions of TAI and their monthly family income profile. The overall computed value is ASig. = 0.029.

Table 16. Difference Between the Perceptions of Respondents in TAI and Their Profile in terms of Monthly Family Income

Perceptions in TAI	H-value	Df	Asymp. Sig.	Decision
Learning Engagement	15.036	6	.020	Reject H_{01} Significant
Access to Learning Materials and Resources	12.249	6	.048	Reject H_{01} Significant
Individualized Pace and Mastery	12.206	6	.049	Reject H_{01} Significant
Real-World Skills Development	13.914	6	.031	Reject H_{01} Significant
Overall	**14.082**	**6**	**.029**	**Reject H_{01} Significant**

ISSN: 2582-0745
Vol. 7, No. 01; 2024

The findings of the previous studies [65,66,67] were parallel with the findings of the current study in highlighting the multifaceted relationship between monthly family income, technology-aided instruction, and academic outcomes. While the studies may not explicitly focus on income-related differences, they underscore the importance of equitable access to technology and the role of well-structured tools and resources provided by educational institutions. Policymakers and teachers should consider socioeconomic factors to ensure inclusive and effective technology integration in education.

Table 17 displays the results of a Kruskal-Wallis Test examining differences in perceptions of respondents regarding TAI and the number of hours spent studying at home per day. The computed asymptotic significant values for dimensions, including learning engagement, access to learning materials and resources, individualized pace and mastery, and real-world skills development, all exceed the significance level of 0.05 (ASig. = 0.830, 0.747, 0.720, 0.826, respectively). Consequently, the null hypothesis is accepted, indicating no significant difference between respondents' perceptions of TAI and their number of hours spent studying at home per day. The overall computed value is ASig. = 0.823.

Table 17. Difference Between the Perceptions of Respondents in TAI and Their Profile in terms of Number of Hours Spent Studying at Home per Day

Perceptions in TAI	H-value	Df	Asymp. Sig.	Decision
Learning Engagement	1.482	4	.830	Accept H_{01} Not Significant
Access to Learning Materials and Resources	1.941	4	.747	Accept H_{01} Not Significant
Individualized Pace and Mastery	2.084	4	.720	Accept H_{01} Not Significant
Real-World Skills Development	1.504	4	.826	Accept H_{01} Not Significant
Overall	**1.521**	**4**	**.823**	**Accept H_{01} Not Significant**

The findings of the previous studies [68,69,70] were parallel with the findings of the current study in contributing to understanding the relationship between time spent studying at home and technology-aided instruction. While not all studies explicitly quantify the time aspect, they collectively underscore the importance of engagement quality, effective online learning strategies, and the positive impact of technology on academic achievement. Policymakers and teachers can use these findings to inform decisions about the integration of technology in education and to address challenges associated with online and technology-aided instruction.

Table 18 presents the results of a Kruskal-Wallis Test investigating differences in perceptions of respondents regarding technology-aided intervention and the highest educational attainment of their learning facilitators. The computed asymptotic significant values for dimensions, such as learning engagement, access to learning materials and resources, individualized pace and mastery, and real-world skills development (ASig. = 0.000, 0.001, 0.000, 0.000, respectively), all fall below the 0.05 significant threshold. Consequently, the null hypothesis is rejected, signifying a notable difference between respondents' perceptions and the highest educational attainment of their learning facilitators. The overall computed value is ASig. = 0.000.

ISSN: 2582-0745
Vol. 7, No. 01; 2024

Table 18. Difference Between the Perceptions of Respondents in TAI and Their Profile in terms of Highest Educational Attainment of the Learning Facilitators

Perceptions in TAI	H-value	Df	Asymp. Sig.	Decision
Learning Engagement	20.473	4	.000	Accept H_{01} Not Significant
Access to Learning Materials and Resources	18.985	4	.001	Accept H_{01} Not Significant
Individualized Pace and Mastery	22.538	4	.000	Accept H_{01} Not Significant
Real-World Skills Development	20.109	4	.000	Accept H_{01} Not Significant
Overall	**21.840**	**4**	**.000**	**Accept H_{01} Not Significant**

The findings of the previous studies [71,72,73] were parallel with the findings of the current study in collectively emphasizing the importance of technology and computer-related factors in enhancing learner achievement. While the highest educational attainment of teachers is not the primary focus, the findings underscore the need for teachers to embrace technology in their teaching methods, adapt to 21st-century learning needs, and recognize the impact of various computer-related factors on academic achievement. Teachers with higher educational attainment may play a crucial role in effectively integrating technology into the teaching and learning process.

4.5. Correlation Between The Perceptions Of Respondents On Tai And Their Academic Performance

In Table 19, Spearman's Rho Correlation Coefficient is utilized to present the correlation between respondents' perceptions of TAI and their academic performance in written works. The perceived TAI, measured in terms of learning engagement, access to learning materials and resources, individualized pace and mastery, and real-world skills development (r_s = 0.334, 0.345, 0.352, 0.346, respectively), exhibits a positively low significant correlation with their academic performance in written works. The corresponding significant values (α = 0.000, 0.000, 0.000, 0.000, respectively) are all below the 5% significance level, leading to the rejection of the null hypothesis. Overall, there is a positively low significant correlation (r_s = 0.337, α = 0.000) between respondents' perceptions of TAI and their academic performance in written works.

Table 19. Correlation Between the Perceptions of Respondents in TAI and Their Academic Profile in terms of Written Works

Perceptions in TAI	Correlation Coefficient	Interpretation		Sig. (2-tailed)	Decision
Learning Engagement	.334	Positive Correlation	Low	.000	Reject Ho_2 Significant
Access to Learning Materials and Resources	.345	Positive Correlation	Low	.000	Reject Ho_2 Significant
Individualized Pace and Mastery	.352	Positive Correlation	Low	.000	Reject Ho_2 Significant

ISSN: 2582-0745
Vol. 7, No. 01; 2024

Real-World Skills Development	.346	Positive Correlation	Low .000	Reject Ho_2 Significant
Overall	**.337**	**Positive Correlation**	**Low .000**	**Reject Ho_2 Significant**

The findings of the previous studies [74,75,76] were parallel with the findings of the current study in collectively emphasizing the importance of understanding learners' preferences, the factors influencing satisfaction and academic performance in online learning, and the overall impact of online education on learner achievement. This knowledge can inform teachers, institutions, and policymakers as they navigate the integration of technology-aided instruction into traditional educational settings.

Table 20 presents the correlation between respondents' perceptions of TAI and their academic performance in performance tasks, using Spearman's Rho Correlation Coefficient. The perceived TAI in terms of learning engagement, access to learning materials and resources, individualized pace and mastery, and real-world skills development (r_s = 0.060, 0.066, 0.085, 0.08, respectively) exhibits a positively very low non-significant correlation with academic performance in performance tasks. The corresponding significant values (α = 0.431, 0.386, 0.263, 0.276, respectively) are all significant at the 5% level, leading to the acceptance of the null hypothesis. Overall, there is a positively very low non-significant correlation (r_s = 0.069, α = 0.365) between respondents' perceptions of TAI their academic performance in performance tasks.

Table 20. Correlation Between the Perceptions of Respondents in TAI and Their Academic Profile in terms of Performance Tasks

Perceptions in TAI	Correlation Coefficient	Interpretation	Sig. (2-tailed)	Decision
Learning Engagement	.060	Positive Very Low Correlation	.431	Accept Ho_2 Not Significant
Access to Learning Materials and Resources	.066	Positive Very Low Correlation	.386	Accept Ho_2 Not Significant
Individualized Pace and Mastery	.085	Positive Very Low Correlation	.263	Accept Ho_2 Not Significant
Real-World Skills Development	.084	Positive Very Low Correlation	.276	Accept Ho_2 Not Significant
Overall	**.069**	**Positive Very Low Correlation**	**.365**	**Accept Ho_2 Not Significant**

The findings of the previous studies [77,78,79] were parallel with the findings of the current study in emphasizing the need to carefully evaluate the impact of technology-aided instruction on various aspects of academic performance, including performance tasks. The findings can inform the development and implementation of effective online education strategies, considering the diverse needs and contexts of learners and teachers.

Table 21 outlines the correlation between respondents' perceptions of TAI and their academic performance in quarterly assessment, employing Spearman's Rho Correlation Coefficient. The perceived TAI, specifically in terms of learning engagement, access to learning materials and resources, individualized pace and mastery, and real-world skills development (r_s =

ISSN: 2582-0745
Vol. 7, No. 01; 2024

0.232, 0.245, 0.248, 0.249, respectively), displays a positively very low significant correlation with academic performance in quarterly assessment. The associated significant values (α = 0.002, 0.001, 0.001, 0.001, respectively) fall below the 5% significance level, leading to the rejection of the null hypothesis. Overall, there is a positively very low significant correlation (r_s = 0.956, α = 0.000) between respondents' perceptions of TAI and their academic performance in quarterly assessment.

Table 21. Correlation Between the Perceptions of Respondents in TAI and Their Academic Profile in terms of Quarterly Assessment

Perceptions in TAI	Correlation Coefficient	Interpretation	Sig. (2-tailed)	Decision
Learning Engagement	.232	Positive Very Low Correlation	.002	Reject Ho_2 Significant
Access to Learning Materials and Resources	.245	Positive Very Low Correlation	.001	Reject Ho_2 Significant
Individualized Pace and Mastery	.248	Positive Very Low Correlation	.001	Reject Ho_2 Significant
Real-World Skills Development	.249	Positive Very Low Correlation	.001	Reject Ho_2 Significant
Overall	**.236**	**Positive Very Low Correlation**	**.002**	**Reject Ho_2 Significant**

The findings of the previous studies [80,81,82] were parallel with the findings of the current study in collectively highlighting the potential benefits of technology-aided instruction, including the use of ICT, online learning, and CAI, on quarterly assessments and overall academic performance. The positive outcomes suggest that strategic and effective integration of technology can contribute to improved learning experiences and outcomes for learners across various subjects and educational levels.

4.6. An Enhanced Instructional Plan: Technology-based Teaching Towards The Improvement Of Academic Performance Of Indigenous Learners

The instructional plan aims to leverage technology to boost academic performance among indigenous learners by providing comprehensive training to teachers through workshops, webinars, and collaborative sessions. Activities like inclusive tech training and appointing learner tech ambassadors aim to create an inclusive learning environment. To address access disparities, digital resource distribution and technology support hotlines are proposed, while individualized learning paths will be implemented to cater to learners' unique needs. Aligning the curriculum with practical skills and establishing measurable benchmarks involve collaboration among school heads, coordinators, and teachers. Improving written communication and critical thinking skills through technology-supported tasks is emphasized, along with regular assessment and ongoing teacher training to continually enhance technology skills and contribute to academic improvement.

ISSN: 2582-0745
Vol. 7, No. 01; 2024

5.CONCLUSIONS

1. Most indigenous learners were 11 years old, predominantly female, and belonged to families with a monthly income of P19,999 and below. They spent less than 1.0 hour studying at home per day and had high school graduates as their learning facilitators.
2. Indigenous learners experienced TAI, reflecting observed engagement in learning, access to learning materials and resources, individualized pacing and mastery, and the development of real-world skills.
3. Indigenous learners exhibited a very satisfactory academic performance in written works, performance tasks, and quarterly assessments.
4. A significant difference was observed in the perceptions of indigenous learners regarding TAI across various dimensions—learning engagement, access to learning materials and resources, individualized pacing and mastery, and real-world skills development. This difference was based on age, monthly family income, and the highest educational attainment of their learning facilitators. The computed asymptotic significance value fell below the 0.05 level, leading to the rejection of the null hypothesis.
5. A low yet positive and significant correlation was noted between respondents' perceptions of TAI across all dimensions—learning engagement, access to learning materials and resources, individualized pacing and mastery, and real-world skills development—and their academic performance in written works and quarterly assessments, respectively. The computed significance value reached significance at a 5% level, resulting in the rejection of the null hypothesis.
6. An instructional plan has been developed to implement technology-based teaching, aiming to enhance the academic performance of indigenous learners.

6. RECOMMENDATIONS

1. Learners should allocate more time for studying at home, considering the reported limited daily study hours; additionally, targeted support and resources should be provided to female learners in families with a monthly income of P19,999 and below.
2. Learners must continue engaging with TAI, emphasizing active participation, the utilization of learning materials and resources, and the mastery of real-world skills, while institutions should ensure sustained access to these instructional methods.
3. Learners must maintain their commitment to academic excellence in written works, performance tasks, and quarterly assessments; implementing regular assessments and feedback mechanisms can reinforce and further enhance their academic achievements.
4. Learners should be offered tailored TAI programs, recognizing observed differences based on age, monthly family income, and the educational background of learning facilitators; this customized approach can address individual needs and optimize the learning experience.
5. Learners must recognize the positive correlation between their perceptions of TAI and academic performance, and educational institutions should foster an environment encouraging continued positive perceptions, emphasizing the importance of learning engagement, access to materials, individualized pacing, and real-world skills development.
6. Learners must actively participate in implementing the technology-based teaching plan designed to enhance their academic performance; continuous feedback loops and adaptability in the instructional plan can further refine its effectiveness over time.

ISSN: 2582-0745
Vol. 7, No. 01; 2024

7. Additional research must explore specific factors influencing reported limited daily study hours and provide targeted support to indigenous learners in lower-income families, aiming to enhance their overall learning experience.
8. Beyond the existing focus on TAI, academic excellence, and the positive correlation between perceptions and performance, further studies must investigate broader factors such as community involvement, cultural sensitivity in teaching methods, and the role of peer support in contributing to the overall academic success of indigenous learners, offering insights for comprehensive educational strategies.

7. ACKNOWLEDGEMENT

The researcher expresses profound gratitude to several individuals and groups whose support and assistance were instrumental throughout the research process. First and foremost, heartfelt thanks are extended to Edgar B. Geniza PhD, Editha B. Geniza PhD, Elisa Aa. Menor PhD, Yzagany Ivarra B. Geniza PECE, MS, and Arturo P. Caseñas Jr. MIT, MHRM, MBA from Mondriaan Aura College, Subic Bay Freeport Zone for their invaluable guidance and encouragement. Special appreciation is also extended to Jessie D. Ferrer, CESO V, Schools Division Superintendent, Melinda D. Punzalan EdD, Public Schools District Supervisor, and Isagani C. Canonizado PhD, Emelyn P. Fontelera EdD, Maria Cristina C. Facun EdD, Marilyn B. Edañol EdD, Prusencio F. Cabaltica, along with all the school heads, Grade 5 indigenous learners, and teachers at Cabangan District, Schools Division of Zambales. Furthermore, the researcher acknowledges the unwavering support of her family members, including Antonio R. Cabling, Jannette L. Cabling, Astrid Jylena L. Cabling, Andrea Joie C. Dantay, Airis Jerika C. Lacbain PhD, and Janna Antnio Cabling. Their encouragement and understanding have been essential in completing this research endeavor. This acknowledgment is a testament to the collective effort and collaboration that contributed to the successful completion of the research project.

REFERENCES

[1] Arias-Ortega, K., Alvarado, N.D., Castillo, D.C., & Soto, M.J.S. (2023). Multilevel schools in an indigenous context: Strengths, limitations, and challenges from the perspective of teachers in La Araucania. Multilevel schools in an indigenous context: strengths, limitations and challenges from the perspective of teachers in La Araucanía (scielo.edu.uy)
[2] Davies, M.J., Highfield, C., & Foreman-Brown, G. (2023). Secondary teachers' beliefs about the relationship between students cultural identity and their ability to think critically. Journal of Pedagogical Research (ijopr.com)
[3] Reid, D.R. (2023). Indigenous peoples and the UN sustainable development goals in South America: The case for change. Indigenous Peoples and the UN Sustainable Development Goals in South America: The Case for Change — Coventry University
[4] Serin, H. (2020). The impact of technology-aided instruction on motivation of Geometry learners. (PDF) The Impact of Technology-Aided Instruction on Motivation of Geometry Learners (researchgate.net)
[5] Baruffati, A. (2023). Technology in education statistics: 2023 Trends. Technology In Education Statistics: 2023 Trends • GITNUX
[6] Li, H., Liu, Z., Yang, F., & Yu, L. (2023). The impact of computer-assisted instruction on student performance: Evidence from the Dual-Teacher Program. The Impact of Computer-Assisted Instruction on Student Performance: Evidence from the Dual-Teacher Program (iza.org)

ISSN: 2582-0745
Vol. 7, No. 01; 2024

[7] Dani, V. (2023). 9 Trends in education technology that will have a major impact in 2023. 9 Trends in Education Technology That Will Have A Major Impact (kitaboo.com)
[8] Haleem, A., Javaid, M., Qadri, M.A., & Suman, R. (2022). Understanding the role of digital technologies in education: A review. Understanding the role of digital technologies in education: A review - ScienceDirect
[9] Carstens, K.J., Mallon, J.M., Bataineh, M., & Al-Bataineh, A. (2021). Effects of technology on student learning. EJ1290791.pdf (ed.gov)
[10] Serin, H. (2020). The impact of technology-aided instruction on motivation of Geometry learners. (PDF) The Impact of Technology-Aided Instruction on Motivation of Geometry Learners (researchgate.net)
[11] Best, J. (2020). 20 Student engagement strategies for a captivating classroom. 20 Student Engagement Strategies for a Captivating Classroom (3plearning.com)
[12] Toth, M.D. (2021). Why student engagement is important in a post-COVID world – and 5 strategies to improve it. Why Student Engagement is Important in a Post-COVID World | Learning Sciences International
[13] Liu, Q., Du, X., & Lu, H. (2022). Teacher support and learning engagement of EFL learners: The mediating role of self-efficacy and achievement goals orientation. Teacher support and learning engagement of EFL learners: The mediating role of self-efficacy and achievement goal orientation | SpringerLink
[14] Su, F., Zou, D., Wang, L., & Kohnke, L. (2023). Student engagement and teaching presence in blended learning and emergency remote teaching. Student engagement and teaching presence in blended learning and emergency remote teaching | SpringerLink
[15] Rice, M.F. & Ortiz, K.R. (2021). Evaluating digital instructional materials for K-12 online and blended learning. Evaluating Digital Instructional Materials for K-12 Online and Blended Learning | SpringerLink
[16] Verde, A. & Valero, J.M. (2021). Teaching and learning modalities in higher education during the pandemic: Responses to coronavirus disease 2019 from Spain. Frontiers | Teaching and Learning Modalities in Higher Education During the Pandemic: Responses to Coronavirus Disease 2019 From Spain (frontiersin.org)
[17] Bearman, A. (2023). Promoting access to diverse learning opportunities through open resources, equity, and accessibility. Promoting Access to Diverse Learning Opportunities through Open Resources, Equity, and Accessibility | Faculty Focus
[18] Lapitan, L.D.S., Tiangco, C.E., Sumalinog, D.A.G., Sabarillo, N.S., & Diaz, J.M. (2021). An effective blended online teaching and learning strategy during the COVID-19 pandemic. An effective blended online teaching and learning strategy during the COVID-19 pandemic - PMC (nih.gov)
[19] Hew, K.F., Jia, C., Gonda, D.E., & Bai, S. (2020). Transitioning to the new normal of learning in unpredictable times: Pedagogical practices and learning performance in fully online flipped classrooms. Transitioning to the “new normal” of learning in unpredictable times: pedagogical practices and learning performance in fully online flipped classrooms | International Journal of Educational Technology in Higher Education | Full Text (springeropen.com)
[20] Dunn, R. (2023). The modern classrooms project: Student efficacy and achievement. The Modern Classrooms Project: Student Efficacy and Achievement (etsu.edu)
[21] Farah, K. (2020). How to create a self-paced classroom. How to Create a Self-Paced Classroom (cultofpedagogy.com)

ISSN: 2582-0745
Vol. 7, No. 01; 2024

[22] Paquin, A. (2023). The integration of indigenous knowledge in education. "The Integration of Indigenous Knowledge in Education" by Andrew Paquin (uw.edu)
[23] Balanon, E.B. (2023). Challenges encountered in managing classroom discipline among intermediate learners: Bases for an action plan. A Master's Thesis. Mondriaan Aura College, Subic Bay Freeport Zone
[24] Tabun, E.F. (2023). Responsive practices and approaches for improving the computational skills of learners: Bases for an action plan. A Master's Thesis. Mondriaan Aura College, Subic Bay Freeport Zone
[25] Tampos, A.T. (2023). Classroom discipline, learning engagement, and academic performance of learners in the special education for the gifted and talented: bases for an action plan. A Master's Thesis. Subic Bay Freeport Zone
[26] Grado, G.M. (2022). Modular printed modality and academic performance of grade 6 learners: Bases for an action plan. A Master's Thesis. Mondriaan Aura College, Subic Bay Freeport Zone
[27] Romerosa, Y.C. (2023). Determinants in improving the reading comprehension skills in English of grade 7 learners: Bases for an action plan. A Master's Thesis. Mondriaan Aura College, Subic Bay Freeport Zone
[28] Villarin, C.M. (2022). Factors affecting the reading difficulties in English of the intermediate learners: Bases for an action plan. A Master's Thesis. Mondriaan Aura College, Subic Bay Freeport Zone
[29] Guzman, J.D. (2023). Psychosocial well-being of grade 7 school learners in the implementation of face-to-face classes: Bases for an action plan. A Master's Thesis. Mondriaan Aura College, Subic Bay Freeport Zone
[30] Herrera, J.L.D. (2023). The use of selected social media platforms and the academic performance of grade 6 learners: Bases for an action plan. A Master's Thesis. Mondriaan Aura College, Subic Bay Freeport Zone
[31] Reyes, G.A.E. (2022). Perceptions of grade 6 learners in the implementation of limited face-to-face classes: Bases for an action plan. A Master's Thesis. Mondriaan Aura College, Subic Bay Freeport Zone
[32] Deliquiña, M.A.R. (2023). Computational skills and academic performance of grade 3 learners using Innovation 4.0: bases for an action plan to create teaching opportunities. A Master's Thesis. Mondriaan Aura College, Subic Bay Freeport Zone
[33] Ebba, J.E. (2022). Learning engagement and academic performance in English of grade 6 learners during the limited face-to-face classes: Bases for an action plan. A Master's Thesis. Mondriaan Aura College, Subic Bay Freeport Zone
[34] Soriano, G.S.E. (2022). Learning engagement and academic performance in science of grade 7 learners: Bases for an action plan. A Master's Thesis. Mondriaan Aura College, Subic Bay Freeport Zone
[35] Barcelon, N.E. (2022). Reading facilitators' engagement in enhancing reading skills in Filipino of grade three learners: Bases for a reading program. A Master's Thesis. Mondriaan Aura College, Subic Bay Freeport Zone
[36] Elcano, A.E. (2022). Technological support for beginning reading performance of kindergarten learners: Bases for an action plan. A Master's Thesis. Mondriaan Aura College, Subic Bay Freeport Zone

ISSN: 2582-0745
Vol. 7, No. 01; 2024

[37] Francisa, M.A. (2022). Digital support and reading performance in English of grade 3 learners: Bases for an action plan. A Master's Thesis. Mondriaan Aura College, Subic Bay Freeport Zone
[38] Major, L., Francis, G.A., & Tsapadi, M. (2021). The effectiveness of technology-supported personalized learning in low- and middle-income countries: A meta-analysis. The effectiveness of technology-supported personalised learning in low- and middle-income countries: A meta-analysis - Major - 2021 - British Journal of Educational Technology - Wiley Online Library
[39] Nadeem, M., Oroszlanyova, M., & Farag, W. (2023). Effect of digital game-based learning on student engagement and motivation. Computers | Free Full-Text | Effect of Digital Game-Based Learning on Student Engagement and Motivation (mdpi.com)
[40] Teng, Y. & Wang, X. (2021). The effect of two educational technology tools on student engagement in Chinese EFL courses. The effect of two educational technology tools on student engagement in Chinese EFL courses | International Journal of Educational Technology in Higher Education | Full Text (springeropen.com)
[41] Abdulrahaman, M.D., Faruk, N., Oloyede, A.A., Surajudeen-Bakinde, N.T., Olawoyin, L.A., Mejabi, O.V., Imam-Fulani, Y.O., Fahm, A.O., & Azeez, A.L. (2020). Multimedia tools in the teaching and learning processes: A systematic review. Multimedia tools in the teaching and learning processes: A systematic review - ScienceDirect
[42] Mohammadi, M., Sarvestani, M.S., & Nouroozi, S. (2020). Mobile phone use in education and learning by faculty members of technical-engineering groups: Concurrent mixed methods design. Frontiers | Mobile Phone Use in Education and Learning by Faculty Members of Technical-Engineering Groups: Concurrent Mixed Methods Design (frontiersin.org)
[43] Shadiev, R. & Yang, M. (2020). Review of studies on technology-enhanced language learning and teaching. Sustainability | Free Full-Text | Review of Studies on Technology-Enhanced Language Learning and Teaching (mdpi.com)
[44] Coman, C., Tiru, L.G., Mesesan-Schmitz, L., Stanciu, C., & Bularca, M.C. (2020). Online teaching and learning in higher education during the coronavirus pandemic: Students' perspective. Sustainability | Free Full-Text | Online Teaching and Learning in Higher Education during the Coronavirus Pandemic: Students' Perspective (mdpi.com)
[45] Dhawan, S. (2020). Online learning: A panacea in the time of COVID-19 crisis. Online Learning: A Panacea in the Time of COVID-19 Crisis - Shivangi Dhawan, 2020 (sagepub.com)
[46] Lee, D., Huh, Y., Lin, C.Y., Reigeluth, C.M., & Lee, E. (2021). Differences in personalized learning practice and technology use in high- and low- performing learner-centered schools in the United States. Differences in personalized learning practice and technology use in high- and low-performing learner-centered schools in the United States | Educational technology research and development (springer.com)
[47] Akram, H., Abdelrady, A.H., Al-Adwan, A.S., & Ramzan, M. (2022). Teachers' perceptions of technology integration in teaching-learning practices: A systematic review. Frontiers | Teachers' Perceptions of Technology Integration in Teaching-Learning Practices: A Systematic Review (frontiersin.org)
[48] Hennessy, S., D'Angelo, S., McIntyre, N., Koomar, S., Kreimeia, A., Cao, L., Brugha, M., & Zubairi, A. (2022). Technology use for teacher professional development in low- and middle-countries: A systematic review. Technology Use for Teacher Professional Development in Low- and Middle-Income Countries: A systematic review - ScienceDirect

ISSN: 2582-0745
Vol. 7, No. 01; 2024

[49] Sahin, D. & Yilmaz, R.M. (2020). The effect of augmented reality technology on middle school students' achievements and attitudes towards science education. The effect of Augmented Reality Technology on middle school students' achievements and attitudes towards science education - ScienceDirect
[50] Cano, J.S. (2022). Comparative analysis of senior high school learners' academic performance in traditional face-to-face and online distance learning modalities. EJ1357615.pdf (ed.gov)
[51] Castillo, A.I.A., Allag, C.F.B., & Bartolome, A.J.R. (2023). The impact of study habits on the academic performance of senior high school students amidst blended learning. The Impact of Study Habits on the Academic Performance of Senior High School Students Amidst Blended Learning (philarchive.org)
[52] Kim, S., Yang, W., Lim, J., Lee, S., Ihm, J., & Park, J. (2021). The impact of writing on academic performance for medical students. The impact of writing on academic performance for medical students | BMC Medical Education | Full Text (biomedcentral.com)
[53] Brew, E.A., Nketiah, B., & Koranteng, R. (2021). A literature review of academic performance, an insight into factors and their influences on academic outcomes of students at senior high schools. A Literature Review of Academic Performance, an Insight into Factors and their Influences on Academic Outcomes of Students at Senior High Schools (scirp.org)
[54] Butt, S., Mahmood, A., Saleem, S., Rashid, T., & Ikram, A. (2021). Students' performance in online learning environment: The role of task technology fit and actual usage of system during COVID-19. Frontiers | Students' Performance in Online Learning Environment: The Role of Task Technology Fit and Actual Usage of System During COVID-19 (frontiersin.org)
[55] Gustafson, M. (2022). The effect of homework completion on students' academic performance. The Effect of Homework Completion on Students' Academic Performance (mnstate.edu)
[56] Caratiquit, K.D. & Caratiquit, L.J.C. (2022). Influence of social media addiction on academic achievement in distance learning: intervening role of academic procrastination. 2202907 (dergipark.org.tr)
[57] Heydarnejad, T., Tagavipour, F., patra, I., & Khafaga, A.F. (2022). The impacts of performance-based assessment on reading comprehension achievement, academic motivation, foreign language anxiety, and students' self-efficacy. The impacts of performance-based assessment on reading comprehension achievement, academic motivation, foreign language anxiety, and students' self-efficacy | Language Testing in Asia | Full Text (springeropen.com)
[58] Tus, J. (2020). Academic stress, academic motivation, and its relationship on the academic performance of the senior high school students. (PDF) Academic Stress, Academic Motivation, and Its Relationship on the Academic Performance of the Senior High School Students (researchgate.net)
[59] Sasota, R.S., Cristobal, R.R., Sario, I.S., Biyo, J.T., & Magadia, J.C. (2021). Will-skill-tool (WST) model of technology integration in teaching science and mathematics in the Philippines. Will–skill–tool (WST) model of technology integration in teaching science and mathematics in the Philippines | Journal of Computers in Education (springer.com)
[60] Staddon, R.V. (2020). Bringing technology to the mature classroom: Age differences in use and attitudes. Bringing technology to the mature classroom: age differences in use and attitudes | International Journal of Educational Technology in Higher Education | Full Text (springeropen.com)

ISSN: 2582-0745
Vol. 7, No. 01; 2024

[61] Vazquez-Cano, E., Saez-Lopez, J.M., Grimaldo-Santamaria, R.O., & Quicios-Garcia, M.D.P. (2023). Influence of age, gender, and years of experience on teachers in promoting strategies for digital sustainability and data protection. Influence of Age, Gender and Years of Experience on Teachers in Promoting Strategies for Digital Sustainability and Data Protection | Vázquez-Cano | Journal of New Approaches in Educational Research (ua.es)
[62] Ahmad, S.R. & Un Nisa, M. (2020). The significance of educational technology in teaching learning process. (PDF) The Significance of Educational Technology in Teaching Learning process (researchgate.net)
[63] Yu, Z. (2021). The effects of gender, educational level, and personality on online learning outcomes during the COVID-19 pandemic. The effects of gender, educational level, and personality on online learning outcomes during the COVID-19 pandemic | International Journal of Educational Technology in Higher Education | Full Text (springeropen.com)
[64] Zhang, W. (2022). The role of technology-based education and teacher professional development in English as a foreign language classes. Frontiers | The Role of Technology-Based Education and Teacher Professional Development in English as a Foreign Language Classes (frontiersin.org)
[65] Amponsah, K.D., Aboagye, G.K., Nark-Kert, M., Commey-Mintah, P., & Boateng, F.K. (2022). The impact of internet usage on students' success in selected senior high schools in Cape Coast Metropolis, Ghana. EJ1353463.pdf (ed.gov)
[66] Magnaye, R.P. DPA (2020). Self-perception of ABM students towards their academic, social, and emotional college preparedness. ED612049.pdf
[67] Osorio-Saez, E.M., Eryilmaz, N., & Sandoval-Hernandez, A. (2021). Parents' acceptance of educational technology: Lesson from around the world. Frontiers | Parents' Acceptance of Educational Technology: Lessons From Around the World (frontiersin.org)
[68] Garcia-Martinez, I., Fernandez-Batanero, J.M., Fernandez-Cerero, J., & Leon, S.P. (2023). Analysing the impact of artificial intelligence and computational sciences on student performance: Systematic review and meta-analysis. Analysing the Impact of Artificial Intelligence and Computational Sciences on Student Performance: Systematic Review and Meta-analysis | García-Martínez | Journal of New Approaches in Educational Research (ua.es)
[69] Hamdan, K. & Amorri, A. (2022). The impact of online learning strategies on students' academic performance. The Impact of Online Learning Strategies on Students' Academic Performance | IntechOpen
[70] Speed, K.D. (2020). Relationship between computer-assisted instruction and student achievement in elementary schools. Relationship Between Computer-Assisted Instruction and Student Achievement in Elementary Schools (waldenu.edu)
[71] Gopo, C. (2022). The role of technology in the 21st century education of learners. (PDF) The role of technology in the 21st century education of learners (researchgate.net)
[72] Liburd, K.K.D. & Jen, H.Y. (2021). Investigating the effectiveness of using a technological approach on students' achievement in mathematics-case study of a high school in a Caribbean Country. Sustainability | Free Full-Text | Investigating the Effectiveness of Using a Technological Approach on Students' Achievement in Mathematics–Case Study of a High School in a Caribbean Country (mdpi.com)
[73] Simoes, S., Oliveira, T., & Nunes, C. (2022). Influence of computers in students' academic achievement. Influence of computers in students' academic achievement - PMC (nih.gov)

ISSN: 2582-0745
Vol. 7, No. 01; 2024

[74] Abuhassna, H., Al-Rahmi, W.M., Yahya, N., Zahiri, M.A., Zakaria, M., Kosnin, A.B.M., & Darwish, M. (2020). Development of a new model on utilizing online learning platforms to improve students' academic achievements and satisfaction. Development of a new model on utilizing online learning platforms to improve students' academic achievements and satisfaction | International Journal of Educational Technology in Higher Education | Full Text (springeropen.com)
[75] Stolan, C.E., Farcasiu, M.A., Dragomir, G.M., & Gherhes, V. (2022). Transition from online to face-to-face education after COVID-19: The benefits of online education from students' perspective. Sustainability | Free Full-Text | Transition from Online to Face-to-Face Education after COVID-19: The Benefits of Online Education from Students’ Perspective (mdpi.com)
[76] Ulum, H. (2021). The effects of online education on academic success: A meta-analysis study. The effects of online education on academic success: A meta-analysis study | Education and Information Technologies (springer.com)
[77] Darkwa, B.F. & Antwi, S. (2021). From classroom to online: Comparing the effectiveness and student academic performance of classroom and online learning. From Classroom to Online: Comparing the Effectiveness and Student Academic Performance of Classroom Learning and Online Learning (scirp.org)
[78] Kumar, A., Sarkar, M., Davis, E., Morphet, J., Maloney, S., Ilic, D., & Palermo, C. (2021). Impact of the COVID-19 pandemic on teaching and learning in health professional education: A mixed methods study protocol. Impact of the COVID-19 pandemic on teaching and learning in health professional education: a mixed methods study protocol | BMC Medical Education | Full Text (biomedcentral.com)
[79] Peteros, E.D., Ypil, S.C., De Vera, J.V., Alcantara, G.A., Fulgencio, M.D., Plando, D.B., & Peconcillo, L.B. Jr. (2022). Effects of school proximity on students' performance in mathematics. Effects of School Proximity on Students' Performance in Mathematics (scirp.org)
[80] Rogayan, D.V. Jr., Padrique, M.J., & Costales, J. (2021). Can computer-assisted instruction improve students' motivation and academic performance in social studies? Can Computer-Assisted Instruction Improve Students' Motivation and Academic Performance in Social Studies? - Journal of Digital Educational Technology (jdet.net)
[81] Valverde-Berrocoso, J., Acevedo-Borrega, J., & Cerezo-Pizarro, M. (2022). Educational technology and student performance: A systematic review. Frontiers | Educational Technology and Student Performance: A Systematic Review (frontiersin.org)
[82] Zheng, M., Bender, D., & Lyon, C. (2021). Online learning during COVID-19 produced equivalent or better student course performance as compared with pre-pandemic: Empirical evidence from a school-wide comparative study. Online learning during COVID-19 produced equivalent or better student course performance as compared with pre-pandemic: empirical evidence from a school-wide comparative study | BMC Medical Education | Full Text (biomedcentral.com)