

Utilization of Mathematical Apps and Websites and the Mathematics Achievement of Grade 10 Students in the New Normal

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Abstract— This study determined the relationship between the utilization of mathematical apps and websites and the mathematics achievement of Grade 10 students in the new normal. It utilized a descriptive correlational method. The respondents were 82 Grade 10 students from the three identified private high schools in Cebu. A modified standardized survey questionnaire was used to get the data for the utilization of math apps and websites and a standardized achievement test was used to identify the math achievement of the respondents. The frequency, percentage, weighted mean, and Chi-square test were used to treat the data. Most parents were college graduates with a combined monthly income of above 30,000 pesos. Furthermore, most of the respondents were using WIFI and smartphones. It also revealed that the extent of using the mathematical apps and websites was interpreted as utilized. The math achievement of the respondents was very satisfactory. Using the statistical treatment, it was found that there is no significant relationship between the demographic profile variables and the extent of utilization of math apps and websites. However, only the combined monthly income posed a significant relationship with the math achievement of the respondents. Moreover, there is a significant relationship between the utilization of math apps and websites and the math achievement of Grade 10 students. It was concluded that the utilization of math apps and websites affects the math achievement of Grade 10 students. The researchers recommend that the strategic intervention material be used and monitored.

Index Terms— Cebu City, Philippines, Descriptive-Correlational Method, mathematics achievement, Teaching Mathematics, utilization of math apps and websites

I. INTRODUCTION

Learning has been greatly affected by the Coronavirus 2019 (COVID-19) pandemic. While many schools have been closed due to the pandemic, others have accepted the challenge and implemented a new learning modality. Different modalities have been used in order to provide a continuation of the learning experience while learning in the comfort of their homes. These modalities include blended learning, remote and modular distance learning, online learning, and the radio broadcast and television learning modality. With the implementation of these modalities, one of the challenges is the technical support or the educational

technology. This also becomes prevalent nowadays. These math applications and websites have been useful as supplementary materials and resources to students as observed in Patronage of Mary Development School (PMDS), Southwestern University PHINMA (SWU PHINMA), and the Cebu Bradford School Inc (CBSI).

Southwestern University has been challenged on how to successfully deliver the full remote distance learning modality. Since there is no face-to-face set-up, different resources have been used to supplement the learning of the students. The set of resources which includes the websites, YouTube links, articles, and applications is called the OERs or the Open Educational Resources. These have been given to students by the teachers to provide the necessary support and discussions. Students open the links and watch videos from the different websites most especially from the lessons which are complicated on their part. Aside from these links and websites, the school also has utilized a free online learning management system, particularly Google Classroom. Google Classroom allows the teachers to post the weekly lessons and instructions through the format Connect, Coach, and Check. Even if the students are given hard copies of the modules, soft copies are still provided so that they can access the materials anywhere and anytime. Applications are also used to support learning. These include the use of Kahoot which gives a live and real-time quiz that serves as a formative assessment. Students also are allowed to open apps including the Bioman, online calculators for mathematics, and other related apps helpful in Science, Math, English, and other subjects. Although it is not required to have synchronous classes, some teachers hold synchronous classes just to discuss important and complex topics through Google Meet. Others pre-record themselves discussing the concept and post these in their online classroom. Students are also given a 10 GB load allowance to access these applications and sites.

Another school also has utilized Google Classroom as the learning management system is the Patronage of Mary Development School (PMDS). Teachers post the instructional packet online and the students can download it as their copy. Those who can't download the file can get it from the school since they are just living nearby the school. The PMDS has utilized both remote and online learning modalities. Students who are under the remote learning modality do not have online classes. They can access the materials offline and can submit the output as scheduled where they can submit these in the school through their parents. They are also given support through the different

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videos which they can watch anytime, and anywhere at their own pace. On the other hand, those who are having online learning modalities, are met on a regular basis and have synchronous classes. The applications used are Google Meet and videos are also played from different websites like Khan Academy and YouTube. There are also available reading passages online where the students can practice their reading comprehension skills.

The Cebu Bradford School Inc (CBSI) teachers are using all means of opportunity to explore different mathematics websites and applications to supplement students' understanding of their mathematics instruction that uses various scaffolding techniques. These apps and websites include adaptive teaching, group games, and analytics. As well, these routines go beyond simple math drills by providing the personalization, tracking, and differentiation each learner needs to be ready for learning. As a result, the teacher finds these apps and websites beneficial especially for difficult students who require additional time to complete a certain task. Moreover, leveraging its use enables individual learners to receive rapid feedback about their performance which is difficult to accomplish especially in the online setting of classroom instruction.

Although these schools have utilized websites and applications as supplementary tools, it can't be denied that they lack the necessary training on how to properly assess the students in the online and remote set-up. It still poses problems for academic integrity and performance and learning accountability to students.

Studying the effectiveness and the relationship between the utilization of applications and websites and the performance of the students has been done even before the pandemic. However, it has been more focused on the experimental study of a particular mobile technology and application whether it is effective or not and forgetting to cover other factors which can improve the performance of the students even during the pandemic and after the pandemic time. Another issue is the output of the study since it is more on the improvement of the tool or technology rather than coming up with a solution on how to integrate the websites and applications in the instructions which will provide the avenue for the remediation of the students.

Since the researchers are Mathematics teachers, it is very beneficial to study how mathematical apps and websites help in the mathematical achievement of the students. The researchers consequently considered applying the advantages of math applications to students' learning. The researchers are interested in determining whether math applications and websites are effective and capable of improving students' math abilities. The main objective of this study is to determine the relationship between the utilization of mathematical applications and websites and the mathematical achievement of Grade 10 students in Arithmetic Sequence and Series. The expected output of this study is the strategic intervention materials to improve the mathematical achievement of students with the integration of math applications and websites which are beneficial to students, teachers, and curriculum planners. This study will be beneficial to those who create curricula that will be examined, evaluated, and adjusted over time to account for students' unique and

growing learning styles and integrate the various resources that fall under the umbrella of educational technology. Lastly, this will act as the cornerstone for putting the expanded curriculum into practice and for figuring out how to make learning more effective for 21st-century learners.

A. Statement of the Problem

This research determined the utilization of mathematical apps and websites, and the mathematics achievement of Grade 10 students in Arithmetic Sequence and Series at the identified private high schools in Cebu for School Year 2022-2023 as the basis for mathematics strategic intervention materials.

Specifically, this study sought to answer the following sub-problems:

1. What is the profile of respondents in terms of:
 - 1.1 age and gender,
 - 1.2 parents' highest educational attainment,
 - 1.3 combined family monthly income,
 - 1.4 sources of internet connectivity, and
 - 1.5 types of devices used?
2. To what extent do the respondents utilize math apps and web page applications in learning mathematics?
3. What is the level of mathematics achievement of the respondents in Arithmetic Sequence and Series?
4. Is there a significant relationship between the:
 - 4.1 demographic profile variables and the extent of the utilization of math apps and websites;
 - 4.2 demographic profile variables and the math achievement in Arithmetic sequence and series;
 - 4.3 extent of the utilization of the mathematical applications and websites and the mathematics achievement in Arithmetic sequence and series.

B. Results and Discussion

Table 1 presents the percentage breakdown of Grade 10 learners by age. It shows that the ages of the respondents range from 14 years old to 18 years old. Most of the respondents have an age of 15 years old which comprise 68.29 percent of the total population, and most of these were females.

Age	Male		Female		Total	
	f	%	F	%	f	%
18	0	0.00	1	1.22	1	1.22
17	2	2.44	1	1.22	3	3.66
16	5	6.09	11	12.5	16	19.51
15	26	31.71	30	36.59	56	68.29
14	2	2.44	4	4.88	6	7.32
Total	35	42.68	47	57.32	82	100.00

Table I. Age and Gender

It is also revealed in the table that most of the respondents

were females with 57.32 percent or 47 respondents. Only 42.68 percent or 35 students were males. Furthermore, based on the data presented, the majority of respondents are female, as more females than males are enrolled in high school in the Philippines. Cruz (2019) reported that not only do females outnumber males in enrollment, but they also outperform males in academic performance. This also has implications for the educational attainment of Filipinos, which can be a barrier to achieving higher educational levels. Furthermore, this suggests that female students may have more difficulties in accessing higher levels of education than male students. In this context, interventions should also target the education system at the community level, so that parents can better understand how to access higher education and ensure that their child receives an education that is free from gender-based barriers. The importance of providing quality training and academic opportunities to the next generation of women cannot be over-emphasized. Finally, programs should seek to empower teachers by emphasizing and incorporating gender-sensitive topics and expectations and focusing on teachers' abilities to provide quality teaching.

Table 2 presents the highest educational attainment of the parents of the respondents. It is quite clear that 58 or 70.73 percent of the respondent's parents were college graduates. Parents are the main role models for students.

Highest Educational Attainment	f	%
College Graduate	58	70.73
College Level	13	15.85
High School Graduate	10	12.20
High School Level	1	1.22
Total	82	100.00

Table II. Parents' Highest Educational Attainment

They have a significant influence over their children, especially during this time of pandemic and this influences how well students perform in school. According to a U.S Education Department's National Center for Education Statistics study administered by Bird (2018) children of college-educated parents are more likely to achieve and actively participate in the class that will help them finish their degree or course. Students will perform better in class if their parents are encouraged to become active in their education. Parents who get active are more likely to encourage their children to participate in extracurricular activities and academic pursuits, which will boost their self-esteem. As a result, students will benefit from this because they will be more self-assured, have stronger communication skills, value themselves more, and have stronger self-esteem and are less stressed. In this way, student's educational experience will be enhanced by parents and teachers cooperating more effectively.

Table 3 presents the combined monthly family income of the parents. It reveals that 18 respondents, or 21.95 percent of the population, have an income of Php 10,000 or less. Only five students believe their family income ranges from Php 10,000 to Php 15,000 per month.

Combined Monthly Family Income	F	%
Above P 30, 000	28	34.15
P 25, 000 - P 30, 000	14	17.07
P 20, 000 - P25, 000	6	7.32
P 15, 001 - P 20, 000	11	13.41
P 10,001 – P15,000	5	6.10

Table III. Combined Monthly Income

With 13.41 percent of the total, 11 students believe their monthly income ranges from Php 15,001 to Php 20, 000. Six respondents have a combined income of Php 20,001 to Php 25, 000. 14 students believed that their monthly family income ranged from Php 25,001 to Php 30, 000. The total income shown in the table was more than Php 30, 0001, which gained 34.15 percent of the population or 28 respondents. A study in China by Ming et al. (2020) found that the family's income ensures basic living and educational support, such as cellphones, computers, the internet, or available technologies, which are effective steps parents can take to promote their school achievement development. As a matter of fact, many families with lower incomes struggle to provide their children with the same level of education and opportunities as more affluent families. Many of these families are living in poverty, which limits their ability to access quality, affordable education. Moreover, households with lower earnings frequently have fewer books, fewer computer resources, and less money for school supplies. According to a different study, having a poor socioeconomic status might have an impact on how families interact and cause behavioral issues that may hinder children's intellectual and academic growth. Furthermore, parents who experience financial difficulties frequently deal with anxiety, low self-esteem, and an inability to cope, which they could transmit to their children.

Table 4 presents the source of internet connectivity. Majority of respondents (76.83 percent) rely far too heavily on WIFI. This is followed by mobile data only which has 17.07 percent of the population.

Source of Internet Connection	F	%
Mobile Data Only	14	17.07
Wi-Fi	63	76.83
Mobile Data and Wi-Fi	4	4.88
Pisonet	1	1.22

	with the use of Math apps and websites.			18	Math applications and websites can help me in finding resources related to my study.	3.26	Highly Utilized
7	Math apps and websites help my ability to concentrate and think deeply about our lesson/topic.	3.07	Utilized	19	Math applications and websites bring many opportunities to the learning process.	3.26	Highly Utilized
8	Use of Math apps and websites in class improve my engagement with the content and class	3.06	Utilized	20	Math applications and websites can help me to access the course material anytime, anywhere.	3.16	Utilized
9	Multitasking with Math apps and websites sometimes prevents me from concentrating on or doing the work that is most important.	2.84	Utilized	21	Math applications and websites can be an easy way to get feedback and notifications from my instructors.	3.04	Utilized
10	I find it useful that I can learn mathematics on the phone anywhere and at any time by accessing Math apps and websites.	3.27	Highly Utilized	22	Math applications and websites can help me to exchange the course material with my friends.	3.05	Utilized
11	The Math apps, websites, and learning activities on the phone were easy to use.	3.07	Utilized	23	Math applications and websites can help me to manage my study.	3.16	Utilized
12	Using Math apps and websites makes sophisticated concepts accessible to students.	3.09	Utilized	24	Math apps and websites help the students understand math concepts better.	3.16	Utilized
				Aggregate Weighted Mean		3.12	Utilized
<p>Legend: 3.25-4.00-Highly Utilized; 2.50– 3.24- Utilized ;1.75 – 2.49- Less Utilized ; 1.00 – 1.74– Not Utilized</p>							
<p>Table VI. Extent to which the respondents utilize math apps and web page applications in learning mathematics</p>							
13	I can learn through the application independently of time and place with the help of Math apps and websites.	3.10	Utilized	This suggests that the widespread use of these contemporary tools in improving academic performance, easily obtaining knowledge, learning at any time and from any location, and aiding learning are all seen as key components in accomplishing their Math activities. The following 3 statements (i.e items 20, 23, and 24) with a higher mean of 3.16 are interpreted as “ utilized” . It can be deduced that the math apps and websites served as simulations and excellent tools for assisting learners in visualizing mathematical concepts as a starting point for more complex math concepts. Furthermore, the study of Kocakoyun and Bicen (2017) firmly attests that with the aid of mobile applications, teachers may encourage students' engagement in class activities and improve their enthusiasm and output. Statement no. 5, on the other hand, has the lowest mean of “ 2.80” and is interpreted as “ utilized” . This recognizes the ease of collaboration in using math apps and websites. Geer et al. (2017) reported that teachers believed that mobile			
14	The utilization of apps and websites increases the quality of education.	3.21	Utilized				
15	Teaching Math concepts using Math apps and websites helps me evaluate my own understanding and performance.	3.13	Utilized				
16	Math applications and websites are useful tools for my study.	3.37	Highly Utilized				
17	Math applications and websites can offer opportunities for communication and team-working.	3.07	Utilized				

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learning positively contributed to student-centered learning, giving students more influence over their education than traditional teaching might have. By letting students learn at their own pace, teachers can give required one-on-one assistance and permit more advanced students to go on to more difficult courses.

Table 7 presents the level of mathematics achievement of the respondents in arithmetic sequence and series. It reflects that 43.90 percent or the majority of survey participants got a Very Satisfactory rating.

Descriptive Rating	Numerical Range	Frequency	Percentage
Outstanding	25 - 30	10	12.20
Very Satisfactory	19 - 24	36	43.90
Satisfactory	13 - 18	23	28.05
Fairly Satisfactory	7 - 12	12	14.63
Poor	0 - 6	1	1.22
Total		82	100.00
Mean		18.79	
Standard Deviation		5.29	

Table VII Level of Mathematics Achievement of the Respondents in Arithmetic Sequence and Series

A satisfactory level of achievement was attained by 23 students or 28.05 percent of the total population, while 12 respondents, or 14.63 percent, received fairly satisfactory ratings. Additionally, 12 percent of the total students, or 10 students, succeeded to the Outstanding level. However, there was only 1.22 percent of the total respondents received an extremely low score. This demonstrates that majority of the students passed the achievement test. This suggests that participants were able to understand the subject matter because many of them were able to pass the test. Most research emphasized using mobile applications to give students a convenient and personalized game-based learning experience will increase their aptitude and interest in mathematics (Yeh et al., 2019). With the help of these websites, anyone can explore supplementary resources for the lessons and video tutorials, interactive test, practice exams, play games, learn arithmetic through enjoyable activities and more which can all be accessed by students using their own devices.

Table 8 presents the test of significant relationship between the profile of the respondents and their utilization of math apps and websites. Between the age of the respondents and

the utilization of math apps and websites, it was revealed that the p-value is 0.804 which is not less than the level of significance of 0.05, therefore, the null hypothesis is accepted. This means that there was no significant relationship between age and the utilization of math apps and websites.

Between the gender of the respondents and the utilization of math apps and websites, it was revealed that the p-value is 0.335 which is not less than the level of significance of 0.05, therefore, the null hypothesis is accepted. This means that there was no significant relationship between gender and the utilization of math apps and websites.

Variables	χ^2	p-value	Decision on Ho	Interpretation
Age	7.759	0.804	Accept Ho	Not significant
Gender	3.389	0.335	Accept Ho	Not significant
Highest Educational Attainment	3.253	0.953	Accept Ho	Not significant
Combined Income	8.707	0.892	Accept Ho	Not significant
Source of Internet	8.577	0.477	Accept Ho	Not significant
Device used	23.025	0.814	Accept Ho	Not significant

Table VIII. Test of Significant Relationship between the profile of the Respondents and their Utilization of Math Apps and Websites

Between the parent' s highest educational attainment of the respondents and the utilization of math apps and websites, it was revealed that the p-value is 0.953 which is not less than the level of significance of 0.05, therefore, the null hypothesis is accepted. This means that there was no significant relationship between the parent' s highest educational attainment and the utilization of math apps and websites

Between the combined income of the parent's respondents and the utilization of math apps and websites, it was revealed that the p-value is 0.892 which is not less than the level of significance of 0.05, therefore, the null hypothesis is accepted. This means that there was no significant relationship between the combined income of the parents and the utilization of math apps and websites.

Between the source of the internet connection among respondents and the utilization of math apps and websites, it was revealed that the p-value is 0.477 which is not less than the level of significance therefore the null hypothesis is accepted. This means that there was no significant relationship between the source of the internet connection and the utilization of math apps and websites.

Between the device used by the respondents and the utilization of math apps and websites, it was revealed that the p-value is 0.814 which is not less than the level of significance

therefore the null hypothesis is accepted. This means that there was no significant relationship between the device used by the respondents and the utilization of math apps and websites.

It has been difficult for the Philippines to adjust to this sudden shift in the educational environment amid the pandemic. In the new normal educational environment, mobile devices like smartphones are a great help due to their variety of capabilities thus optimizing their use as learning potential. Another study by Cleofas and Rocha (2021) found that low-income children lack access to laptops and have limited internet connections. According to Beng et al. (2020), increasing use of technology during the pandemic may have improved students' social and cognitive health, whereas a lack of technology and connectivity for online learning has been associated with higher levels of stress in students (Baticulon et al., 2021).

Table 9 shows the relationship between the demographic profile of the respondents and the math achievement of respondents in Arithmetic Sequence and Series. Between the age of the respondents and the math achievement, it was revealed that the p-value is 0.739 which is not less than the level of significance of 0.05, therefore, the null hypothesis is accepted. This means that there was no significant relationship between age and math achievement.

Between the gender of the respondents and the math achievement, it was revealed that the p-value is 0.223 which is not less than the level of significance of 0.05, therefore, the null hypothesis is accepted. This means that there was no significant relationship between gender and math achievement.

Variables	χ^2	p-value	Decision on Ho	Interpretation
Age	12.073	0.739	Accept Ho	Not significant
Gender	5.690	0.223	Accept Ho	Not significant
Highest Educational Attainment	16.675	0.162	Accept Ho	Not significant
Combined Income	42.060	0.003	Reject Ho	Significant
Source of Internet	16.054	0.189	Accept Ho	Not significant
Device used	53.594	0.074	Accept Ho	Not significant

Table IX. Test of Significant Relationship between the profile of the Respondents and their Mathematics Achievement

Between the parent' s highest educational attainment of the respondents and the math achievement, it was revealed that the p-value is 0.162 which is not less than the level of

significance of 0.05, therefore, the null hypothesis is accepted. This means that there was no significant relationship between the parent' s highest educational attainment and the math achievement

Between the combined income of the parent' s respondents and the math achievement, it was revealed that the p-value is 0.003 which is less than the level of significance of 0.05, therefore, the null hypothesis is rejected. This means that there was a significant relationship between the combined income of the parents and math achievement.

Between the source of the internet connection among respondents and the math achievement, it was revealed that the p-value is 0.189 which is not less than the level of significance of 0.05, therefore, the null hypothesis is accepted. This means that there was no significant relationship between the source of the internet connection and math achievement.

Between the device used by the respondents and the math achievement, it was revealed that the p-value is 0.074 which is not less than the level of significance, of 0.05 therefore, the null hypothesis is accepted. This means that there was no significant relationship between the device used by the respondents and the math achievement. Further investigation demonstrated that none of these factors, including age, gender, parents' greatest level of education, and the type of device the students were using, affected their academic performance.

However, the data concerning their parent' s combined income significantly differ. Parental attitudes toward education are correlated with family socioeconomic status (SES), which has a major impact on children's academic progress (Hascoët et. al 2021). The findings of the same study demonstrated that students' mathematics achievement was influenced by their mathematics self-concept, the socioeconomic and educational context of their families, and their parent's expectations for their academic success.

Table 10 shows the test of the relationship between the utilization of math apps and websites and the math achievement in Arithmetic Sequence and Series. It was revealed that the p-value is 0.042 which is less than the level of significance therefore the null hypothesis is rejected.

Variable	χ^2	p-value	Decision on Ho	Interpretation
Utilization Level Vs. Math Achievement	21.613	0.042	Reject Ho	Significant

*significant if $p < 0.05$

Table X. Test of Relationship between the utilization of the mathematical apps and websites and mathematics achievement of the respondents

This means that there is a significant relationship between the utilization of math apps and websites and math achievement in Arithmetic Sequence and Series. This implies that the utilization of math apps and websites influences the math

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achievement of the students. Additionally, it demonstrates how Math Apps considerably enhance students' gained skills and knowledge, which in turn has an impact on how well students perform in mathematics in this New Normal Education. This agrees with the results of the study conducted by Barrientos (2021) that Math Apps significantly affect the student's performance in the subject. Moreover, it also is supported by the study of Cantonjos and Labo (2020) that Math Apps are very effective in improving the performance of students in a mathematics subject.

II. CONCLUSION

Based on the findings of the study, it was concluded that the utilization of math apps and websites poses an influence in the achievement of students in arithmetic sequence and series.

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REFERENCES

- [1] Ababa, et. al (2021). The Use of Educational Applications on the Student's Academic Performance. ISSN: 2643-9670 Vol. 5 Issue 1. Retrieve from <https://bit.ly/3U5FuIY>
- [2] Adjei, N. D., (2019). The Use and Effect of Smartphones in Student's Learning Activities: Evidence from the University of Ghana, Legon. Library Philosophy and Practice. Retrieved from <https://bit.ly/3LH3xj7>
- [3] Affum, M. Q. (2022). The Effect of Internet in Student's Studies: A Review. Library Philosophy and Practice (e-journal). 6932. Retrieved from <https://bit.ly/3UsCA6P>
- [4] Akin, A. (2022) The effectiveness of web-based Mathematics instruction (WBMI) on K-16 students' mathematics learning: a meta-analytic research. *EduInf Technol.* Retrieved from <https://bit.ly/3MJzwOI>
- [5] Aransi, W. O. (2018). Impact of Age and Gender on High School Student's Academic Performance in Economics: A Case Study Analysis. ISSN: 2455-0620 Volume - 4, Issue - 1. Retrieved from <https://bit.ly/3S1xM6A>
- [6] Asio, J.M., Gadia, E., Abarintos, E., Paguio, D., Balce, M., (2021). Internet Connection and Learning Device Availability of College Students: Basis for Institutionalizing Flexible Learning in the New Normal Retrieved from <https://bit.ly/3DYh2JK>
- [7] Ayebele, L., Habaasa, G., & Tweheyo, S., (2020). Factors affecting students' achievement in mathematics in secondary schools in developing countries: A rapid systematic review. *Statistical Journal of the IAOS*, vol. 36, no. S1, . Retrieved from <https://bit.ly/3swCm1M>
- [8] Barrientos, I. (2021). The Use of Math Apps and the Mathematics Performance of Grade 8 Students in New Normal Education. *International Journal of Research and Development*, Volume 6, Issue 7. doi: 10.36713/epra7869. Retrieved from <https://bit.ly/3HGmRy4>
- [9] Baticulon, R. E., Sy, J. J., Alberto, N. R. I., Baron, M. B. C., Mabulay, R. E. C., Rizada, L. G. T., Tiu, C. J. S., Clarion, C. A. and Reyes, J. C. B. (2021). Barriers to online learning in the time of COVID-19: A national survey of medical students in the Philippines. *Medical science educator*. 1–12. Retrieved from <https://bit.ly/3R625Id>
- [10] Beng, J. T., Tiatri, S., Lusiana, F., & Wangi, V. H. (2020). Intensity of gadgets usage for achieving prime social and cognitive health of adolescents during the COVID-19 pandemic. In *The 2nd Tarumanagara International Conference on the Applications of Social Sciences and Humanities (TICASH 2020)*, 735–741, Atlantis Press. Retrieved from <https://bit.ly/3LGk4Ur>
- [11] Bird, G. (2018). The Impact of Parents' Education Levels. *Inside Higher Ed.* Retrieved from <https://bit.ly/3dFZcAk>
- [12] Cabrera, A. F., Peralta, A. M., & Kurban, E. R. (2018). The invisible 1%: A comparison of attaining stepping stones toward college between military and civilian children. *Journal of Higher Education*, 89(2), 208–235. Retrieved from <https://bit.ly/3f9ZAh>
- [13] Cakiroglu, U. & Yilmaz, H. (2017) Using Videos and 3D Animations for Conceptual Learning in Basic Computer Units. *Contemporary Educational Technology* 8(4) 390 - 405. Retrieved from <https://bit.ly/3PitbM9>
- [14] Calder, N., & Murphy, C. (2018). Using Apps for Teaching and Learning Mathematics: A Socio-Technological Assemblage (pp. 2). Retrieved from <https://bit.ly/3mH3qsk>
- [15] Cantonjos, J. B., & Labo, A. D. (2020). Effectiveness of Math Apps in Improving the Performance of the Grade 11 Students in Probability. *International Journal of Science and Research (IJSR)*. ISSN: 2319-7064. Retrieved from <https://bit.ly/3SegUdM>
- [16] Center for Innovation in Research on Teaching (2019). Correlational Research Overview. Retrieved from [gcu.edu website: https://bit.ly/3T5QoTT](https://bit.ly/3T5QoTT)
- [17] Chase, T.J.G., Julius, A., Chandan, J.S., Powell, E., Hall, C.S., Phillips, B.L., Burnett, R., Gill, D., & Fernando, B. (2018). Mobile learning in medicine: An evaluation of attitudes and behaviors of medical students. *BMC Medical Education*, 18(152), 1-8. Retrieved from <https://bit.ly/3DYh2JK>
- [18] Cleofas, J.V., & Rocha, I.C.N. (2021). Demographic, gadget, and internet profiles as determinants of disease and consequence related COVID-19 anxiety among Filipino college students. *Education and Information Technologies*. Retrieved from <https://bit.ly/3BK9ozw>
- [19] Cruz, R. (2019) More women in HS, college than men in PH. *Philippine Daily Inquirer*. Retrieved from <https://bit.ly/3UCqCYe>
- [20] Delgado, P. (2019). The Importance of Parental Involvement in Teaching. Institute for the future of Education. Retrieved from <https://bit.ly/3DgqWEy>
- [21] Demir & Akpinar (2018). The effect of mobile learning applications on students' academic achievement and attitudes toward mobile learning. *Malaysian Online Journal of Educational Technology*. (Volume 6 - Issue Retrieved from <https://bit.ly/3UF0Jr6>
- [22] Department of Education (2020) Accelerating DepEd's Computerization Program in the view of the Covid-19 Pandemic. Aide Memoire Updated 05 August 2021. Retrieved from <https://bit.ly/3QusMr2>
- [23] DepEd Division of Cebu Province Memorandum No. 184 Series (2021). Reopening of the Virtual In-Service Training (VINSET) Course Retrieved from <https://bit.ly/3tLhgh7>
- [24] Durisic, M., & Bunijevac, M., (2017) Parental Involvement as a Important Factor for Successful Education. *CEPS Journal | Vol.7 | No. 3*. Retrieved from <https://bit.ly/3g5D6bb>

- [25] Estira, K.L.A. (2020). Online distance learning readiness of business administration students in one state university in the Philippines. *Journal of Critical Reviews*, 7(12), 826-832. Retrieved from <https://bit.ly/3LH5Xy8>
- [26] Etcuban, J. O et. al (2019). Facilitating Learning Mathematics Through the Use of Instructional Media International Electronic Journal of Mathematics Education e-ISSN: 1306-3030. 2019, Vol. 14, No. 3, 677-688 Retrieved from <https://bit.ly/3BX2WGJ>
- [27] Fabian, K., Topping, K.J. & Barron, I.G (2018) Using mobile technologies for mathematics: effects on student attitudes and achievement. *Educational Technology Research & Development* 66, 1119–1139. Retrieved from <https://bit.ly/3zBCx0s>
- [28] Fabito, B.S., Trillanes, A.O., & Sarmiento, J.R. (2021). Barriers and challenges of computing students in an online learning environment: Insights from one private university in the Philippines. *International Journal of Computing Sciences Research*, 5(1), 441-458. Retrieved from <https://bit.ly/3DMaIVq>
- [29] Flynn, S. (2021). Technology-Based Multitasking: How Does It Affect eLearning? eLearning Industry Article. Retrieved from <https://bit.ly/3TrBc2Y>
- [30] Geer, R., White, B., Zeegers, Y., Au, W. & Barnes, A., (2016). Emerging pedagogies for the use of iPads in schools. *British Journal of Educational Technology*, 48(2). pp. 490-498. Retrieved from <https://bit.ly/3C6CpXR>
- [31] Ghasemi, E., Burley, H. (2019) Gender, affect, and math: a cross-national meta-analysis of Trends in International Mathematics and Science Study 2015 outcomes. *Large-scale Assess Educ* 7, 10. Retrieved from <https://bit.ly/3Su1XDy>
- [32] Han, X., Luo, H., Yang, J., & Jiang, S. (2021). Fading Scaffolds for Better Online Learning? A Comparative Analysis of Three Scaffolding Practices. *10.1007/978-3-030-80504-3_27*. Retrieved from <https://bit.ly/3tYhxgY>
- [33] Hartman, R., Townsend, M., Jackson, M. (2019). Educators' Perceptions of Technology Integration into the Classroom: A Descriptive Case Study. *Journal of Research in Innovative Teaching & Learning* ISSN: 2397-7604. Retrieved from <https://bit.ly/3yO9yEI>
- [34] Hathella, H., & Priyanath, H. M. (2021). How Demographic Features and Attitudes of Student affect the Mathematics Performance of Students? With special reference to the Ordinary Level Students in Ratnapura Educational Zone in Sri Lanka. *International Journal of Education, Teaching, and Social Sciences*, 1(1), 28-47. Retrieved from <https://bit.ly/3DYEdUf>
- [35] Hillmayr, D., Ziemwald, L., Reinhold, F., Hofer, S. I., & Reiss, K. M. (2020). The potential of digital tools to enhance mathematics and science learning in secondary schools: A context-specific meta-analysis. *Computers & Education*, 153, 1–25. Retrieved from <https://bit.ly/3xsRbVa>
- [36] Hossain, M.A., & Rahman, M.H. (2017). Comparative study of internet usage among university students: A study of the University of Dhaka, Bangladesh. *European Scientific Journal*, 13(34), 134-150. Retrieved from <https://bit.ly/3BcJ45T>
- [37] Idris, M., Hussain, S., Ahmad, N., (2020) - Relationship between Parents' Education and their children's Academic Achievement. *Journal of Arts and Social Sciences* 7(2). Retrieved from <https://bit.ly/3fk1Gou>
- [38] Jin, W., & Sabio, C.J. (2018). Potential use of mobile devices in selected public senior high schools in the city of Manila Philippines. *International Journal of Learning, Teaching and Educational Research*, 17(4), 102-114. Retrieved from <https://bit.ly/3DMKbqT>
- [39] Kay, R. H., (2020). Analysing the use of mathematics apps in elementary school classrooms. *Contemporary Educational Researches Journal*. 10(2), 68-78. Retrieved from <https://bit.ly/3DanJq0>
- [40] Kean, P. D., Tighe, L., Waters, N., (2020). The Role of Parent Educational Attainment in Parenting and Children's Development. Retrieved from <https://bit.ly/3UHnevH>
- [41] Kirkwood, A. & Price, L. (2016) Questionnaire on Learner Use of Technology: Technology-Enabled Learning Implementation Handbook (pp.59-68) Appendix 1 Retrieved from <https://bit.ly/3IOXaJ5>
- [42] Kocakoyun, S., & Bicen, H. (2020). Development and Evaluation of Educational Android Application, vol 12, issue 2, pp. 58-68, 2017 Retrieved from <https://bit.ly/3DQDV1E>
- [43] Linares, E. & Borba, M. (2020). Transformation of the mathematics classroom with the internet. *ZDM : The International Journal on Mathematics Education*, 52(5), 825–841. Retrieved from <https://bit.ly/3mO45YO>
- [44] Manila Times (2022). UNESCO report on PH education: Girls better than boys. Retrieved from <https://bit.ly/3Dw0loe>
- [45] Manila Times (2021). Slow Internet Hounds Learners. Retrieved from <https://bit.ly/3DaNMNv>
- [46] Minero, E. (2020). 11 Teacher-Recommended Math Apps and Online Tools. George Lucas Educational Foundation. Retrieved from <https://edut.to/3UD6Uvw>
- [47] Ming, W., Wang, W., Wan, N., & Su, D. (2020). Family Income and Student Educational and Cognitive Outcomes in China: Exploring the Material and Psychosocial Mechanisms. Retrieved from <https://bit.ly/3xJvKjJ>
- [48] Misirli, O., & Ergulec, F. (2021). Emergency remote teaching during the COVID-19 pandemic: Parents experiences and perspectives. *Education and Information Technologies*, 26, 6699–6718. Retrieved from <https://bit.ly/3xysLd8>
- [49] Mohammadi, M., Sarvestan, M. S., & Nouroozi, S. (2020) Mobile Phone Use in Education and Learning by Faculty Members of Technical-Engineering Groups: Concurrent Mixed Methods Design. Administration and Educational Planning Department, Faculty of Educational Sciences and Psychology. Retrieved from <https://bit.ly/3BFuv7B>
- [50] Montijo, E. (2017). The Effects of Desmos and TI-83 Plus Graphing Calculators on the Problem-Solving Confidence of Middle and High School Mathematics Students. Retrieved from <https://bit.ly/39omt7L>
- [51] Nguyen, D. & Kulm, G. (2005) Using Web-based Practice to Enhance Mathematics Learning and Achievement. Volume 3, Number 3, Winter 2005. *Journal of Interactive Online Learning* ISSN: 1541-4914. Retrieved from <https://bit.ly/3OqfEBA>
- [52] Ntibi, J. (2021). Students' demographic factors and their academic achievement in Mathematics and Physics in Calabar Metropolis of Cross River State, Nigeria. *Journal of Counseling Psychology* 4(1):121-130. Retrieved from <https://bit.ly/3Sw8Iof>
- [53] Obina, J., Gabe, J., Angcon, S. M., Diaz, B. T., Largo, V. J., Chiva, M., Bolaños, J., (2022). Math Apps Utilization: Its Perceived Effects to the Academic Performance of Mathematics Major students. Vol. 9 No. 9., Retrieved from <https://bit.ly/3sfUE7c>
- [54] Oikarinen, R.M., Oikarinen, J.K., Nuutinen, S. H & Pöntinen, S., (2022) Students' collaboration in technology-enhanced reciprocal peer tutoring as an approach towards learning mathematics. Retrieved from <https://bit.ly/3dCLvLl>
- [55] Owate, C. N., Afolabi, M., & Akanwa, P. C., (2017). Demographic variables and students use of e-learning resources in public secondary schools libraries in Rivers State of Nigeria. *ISSN 2141-6656 Vol.9(2)*. Retrieved from <https://bit.ly/3DRWSke>
- [56] Philippine Daily Inquirer (2021). 58% of Filipino students used devices for distance learning – SWS. Retrieved from <https://bit.ly/3LGpuPw>
- [57] Radović, S., Marić, M. & Passey, D. (2019). Technology enhancing mathematics learning behaviours: Shifting learning goals from “producing the right answer” to “understanding how to address current and future mathematical challenges”. *Educ Inf Technol* 24, 103–12. Retrieved from <https://bit.ly/3UdUr1k>
- [58] Sari, M. S., Hapizah, H., Susanti, E. (2020). Development of teaching materials arithmetic sequence and series based on android for problem based learning. *Journal of Physics Conference Series* 1480(1):012024. Retrieved from <https://bit.ly/3W2UhuA>
- [59] Stanojevic, L. & Rakic, B (2018) Mobile Technology in Higher Education - A Students Perspective on Learning with Mobile Computing Devices. Employment, Education, and Entrepreneurship Conference. Retrieved from <https://bit.ly/3cqV5XF>
- [60] Supandi, L. A., Kusumaningsih, W., & Aini, A. N., (2018) Mobile phone application for mathematics learning. *J. Phys.: Conf. Ser.* 983 012106. Retrieved from <https://bit.ly/3N8UcBm>
- [61] Tao, L & Han, L. (2017). The Effects of Family Income on Children's Education: An Empirical Analysis of CHNS Data: DOI:10.24104/rmhe/2017.04.02002 Retrieved from <https://bit.ly/3S1xM6A>
- [62] Tarimo, R., & Kavishe, G. (2017). Internet access and usage by secondary school students in Morogoro municipality, Tanzania. *International Journal of Education and Development Using Information and Communication, Technology*, 13(2), 56-69. Retrieved from <https://bit.ly/3QBDtqE>
- [63] Tetzlaff (2017). Using Mobile T Using Mobile Technology t echnology to Increase the Math Achie ease the Math Achievement and ement and Engagement of Students with Disabilities. UNLV Theses, Dissertations, Professional Papers, and Capstones. Retrieved from <https://bit.ly/3TGKrgm>
- [64] Tomul, E., Onder, E., Taslidere, E. (2021). The relative effect of student, family and school-related factors on math achievement by

Utilization of Mathematical Apps and Websites and the Mathematics Achievement of Grade 10 Students in the New Normal

location of the school. Large-scale Assess Educ 9, Retrieved from <https://bit.ly/3zhzGcc>

- [65] UNESCO Institute for Statistics (2022). School enrollment, primary and secondary (gross), gender parity index (GPI). Retrieved from <https://bit.ly/3SeqVH8>
- [66] Vidyalankar Organization (2021). Benefits of Mobile Apps in Education. Retrieved from <https://bit.ly/3ScO0KI>
- [67] Wang, J. (2022). Math App Produces Long-term Benefits for Children, Parents. UChicago News Office. Retrieved from <https://bit.ly/3dCMGBK>
- [68] Yeh, C. Y., Cheng, Hercy., N. & Chan, T. W., (2019). Enhancing achievement and interest in mathematics learning through Math-Island. Research and Practice in Technology Enhanced Learning. Retrieved from <https://bit.ly/3BGGVLc>

AUTHORS' PROFILE



Ms. Babejane G. Arita is an accomplished and inspiring 24-year-old mathematics educator. Having discovered her love for teaching at a young age, she embarked on a journey to empower and enlighten young minds through the realm of mathematics for more than three years. Her classroom is a

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Ms. Lynniel D. Peradilla graduated her Bachelor of Science major in Mathematics at Cebu Normal University, Cebu City, Philippines. She enrolled in MA degree and graduated with her Master of Arts in Education majoring in Mathematics at Cebu Technological University, Cebu, Philippines. She has been with the teaching ministry for 15 years already. She taught at Nuestra Señora De Las Nieves, Inc. for 6 years in Junior High School department. She taught at St. Paul College Foundation Inc. for 3 years and currently teaching at Southwestern University PHINMA in Senior High School department as Mathematics teacher.



Dr. Patrick M. Salinas graduated his Bachelor of Secondary Education major in Mathematics at Southwestern University PHINMA, Cebu City, Philippines. He was awarded as the Best Student Teacher. He also graduated Summa Cum Laude. After four years, he finished his Master of Arts in Education major in Administration and Supervision at Cebu Technological University, Philippines. After finishing his MA, he enrolled at Southwestern University PHINMA and finished his Doctor of Education major in Educational Management. Even if he finished his Degree in Doctor of Education, he again enrolled in another MA degree and graduated his Master of Arts in Education major in Mathematics at Cebu Technological University, Cebu, Philippines. He has been with the teaching ministry for 11 years already. He was the School Principal of the Senior High School Department of Southwestern University PHINMA before teaching at Las Vegas, Nevada, USA. During his term as a teacher and school principal of Southwestern University PHINMA, he was awarded Best Teacher for consecutive years. He was also awarded as the Top Performing Head both first and second semester during his reign as the School Principal. He is currently teaching in Las Vegas, Nevada, USA. During his first year of teaching in the United States of America, he taught at Fremont Professional Development Middle School Academy of Medical Sciences as a 7 th grade Mathematics teacher. Now, he is teaching as a Geometry teacher at Las Vegas High School.