

Enhancing Academic Performance in Mathematics of Grade 11 Students through Pre-Recorded Lesson and Home Tutorial Session

Neilkim-Peter J. Tapado

Abstract

Purpose. The main objective of the study is to find out if there is a significant difference in the pre-test and post-test results of the students before and after giving pre-recorded lessons and home tutorial sessions. This study also wants to determine its implications for the students.

Design/Methodology/Approach. The study employed descriptive research utilizing a quantitative approach through the comparative method to determine if there is a significant difference in the pre-test and post-test results of the students before and after giving pre-recorded lessons and home tutorial sessions. The respondents to the study were the 32 Grade 11 students at Jomalig National High School who took the General Academic Strand (GAS). The respondents were chosen purposefully.

Findings. The findings of the study revealed that there were notable and significant differences between the pre-test and post-test scores of the students involved in the interventions. The pre-test and post-test data revealed a mean of 12.25 and 26.5312, respectively. The data also revealed a computed t-value of 24.52165006 and a p-value of 3.66137E-22 at the 0.05 level of significance, which shows that there is a significant difference in the pre-test and post-test scores of the students while giving the pre-recorded lesson and home tutorial session. Consequently, giving pre-recorded lessons and home tutorial sessions had a massive effect on the academic performance in mathematics of grade 11 students. Thus, giving a pre-recorded lesson and a home tutorial session enhanced the academic performance of grade 11 students in mathematics.

Originality/Value. This research provided significant data on the impact of pre-recorded lessons and home tutorial sessions on the academic performance of Grade 11 students. This also revealed a significant difference between their performances through pre-recorded lessons and home tutorial sessions before and after the implementation of the interventions.

Key Words: Academic performance, Pre-recorded lesson, Home tutorial

Introduction

The COVID-19 pandemic presented unusual problems to all parties involved, including teachers, parents, and most importantly, students. When using the modular learning style in mathematics, the new normal education approach had a considerable impact on student performance. The study by Bibon and Barcnas (2021) states that some problems encountered in modular distance learning include support systems, which

Neilkim-Peter J. Tapado, a Junior High School Teacher-I, Mathematics Coordinator at Department of Education-Jomalig National High School

revealed that their immediate family support system could not aid in their academic needs. Indeed, parents or guardians were essential workers in the modular learning modality. However, they were short on time when it came to assisting children with their homework at home. Maybe they were too focused on their work and lacked the knowledge and abilities to aid students in their study of mathematics. According to the study of Gueta and Janer (2021), many students struggled the most with learning properly and succeeding in school under the new normal circumstances and now find it tough in some cases. The majority of students were having problems understanding the modules and other subjects, particularly math. Some students complained that most mathematics problems were tough to solve and that no thorough explanations were offered. Calculation alone was not sufficient to solve a problem; the issues also needed to be fully understood and analyzed.

Based on the aforementioned feedback, teachers should take appropriate action. The use of a self-learning mathematics module by students should be encouraged. The Department of Education issued Regional Memorandum No. 393 s. 2020, which stated that in order to provide assistance or remediation for students who do not have access to learning facilitators at home, the subject teacher or a cluster learning facilitator may conduct a home visitation in accordance with social distancing protocols or conduct communication through text messages, phone calls, live chats, or other available forms of communication. In addition, other learning textbooks, learners' materials, MELCs-aligned teacher-made videos, audio lesson modules, activity sheets, and interactive electronic materials may supplement the required learning resource for each learning modality. Meanwhile, the Department of Education, No. 32 s. 2020, stated that learning support must be prioritized for communities or barangay schools with a higher number of learners or households. Priority in the deployment of learning support aides will be given to learners who are unable to manage independent learning, including those with disabilities and special needs, as well as households without any available family members or responsible adults who can support the child's distance learning. It is supported by the study of the Center for Education Statistics and Evaluation (2015), which revealed that one approach to addressing the disparity in student outcomes is through the implementation of remedial tutoring programs aimed specifically at improving the school performance of disadvantaged students. Consequently, the lessons from the self-learning module will be obtainable to students. Students truly need the assistance of the teachers in each lesson in mathematics for the self-learning module, as can be seen in the aforementioned statement above. These actions will guarantee that teachers impart the appropriate knowledge needed for students to learn the lessons in mathematics. However, students at Jomalig National High School are now performing poorly in mathematics. They rarely provided an output for the subject, and when they did, no response was provided. Consequently, as a researcher, it is vital to determine if there is a significant difference in the pre-test and post-test results of the students before and after giving pre-recorded lessons and home tutorial sessions. Thus, the researcher is eager and motivated to find out the result of this study.

Research Questions

The study sought to answer the following questions

1. What is the pre-test result of students before giving a pre-recorded lesson and a home tutorial session?
2. What is the post-test result of students after a pre-recorded lesson and a home tutorial session?

3. Is there a significant difference in the pre-test and post-test results of the students before and after giving pre-recorded lessons and home tutorial sessions?
4. What is the implication of the results in the teaching and learning process in this time of pandemic?

Hypothesis

Ho: There is no significant difference in the pre-test and post-test results of the students before and after giving a pre-recorded lesson and a home tutorial session.

Brief Review of Related Literature and Studies

Academic Performance in Mathematics

Odiri (2015) argued that in terms of the quality of mathematics education and student performance, learning habits play an important role. It is the partnership between the classroom and out-of-class learning that creates learning habits for students. Ebele and Olofu (2017) added that the way students organize their studies determines their grades. It is the level of preparation and strategy that students develop and use that influences subject proficiency. In fact, Sakirudeen and Sanni (2017) found that learning habits such as taking notes, using the library, and managing time affect the academic performance of the students. They also recommended that group counseling initiated by professional counselors be organized in schools to raise awareness of practical learning habits and provide a functional library in secondary school. In light of the study undertaken, watching pre-recorded lessons may be one of the learning habits adopted by the students because, through this, students may have an assurance of learning a specific lesson. For instance, in Mathematics. Thus, students may perform better academically in Mathematics.

Furthermore, attitude is another factor that primarily predicts student performance in Mathematics. A study conducted at Stanford University found that a positive attitude towards Mathematics accelerates brain memory and predicts Mathematics performance (Chen et al., 2018). Karjanto (2017) found that there was a significant positive correlation between Mathematics grades and the positive attitude of the students towards Mathematics. The willingness of the students to learn and the benefits to bring to their Math lessons are affected by these positive attitudes (Atanasova-Pacemska et al., 2015). In light of the study undertaken, giving pre-recorded lessons and home tutorials by the teachers may affect the attitude of the students. Through this, students may have a positive attitude towards learning, for instance, Mathematics, since teachers guide them well. Consequently, the academic performance of the students in Mathematics may be better.

Moreover, Hatties (2017) updated the list of factors that influence student performance. These factors include those that teachers, principals, students, or parents can control or influence, and the corresponding impact values for each factor. Despite determining the effect size of each factor, no studies have been recorded to integrate the interactions or combinations of these hierarchical factors in the mathematical performance of the Philippines, especially Mindanao. In light of the study undertaken, the teacher is one of the factors that influence the performance of the students. Students can learn Mathematics if the teacher delivers a pre-recorded lesson and conducts home tutorials with them. Thus, the academic performance of the students may be better.

Meanwhile, the Philippines ranks second among the participating countries in the latest Program for International Student Assessment (PISA) 2018, according to the Philippine Department of Education

National Report (2019). This amazing result shows that Filipino students scored an average of 353 points. In light of the study undertaken, by giving pre-recorded lessons and home tutorials by the teachers, students may perform better while continuing their education. Consequently, the Philippines may have a good rank again in PISA.

However, in math literacy, it is well below the Organization for Economic Cooperation and Development (OECD) average of 489 points. In fact, according to Macha, Mackie, and Magaziner (2018), the Philippines ranked only 34th place in the study of Trends in International Mathematics and Science Study (TIMSS). Furthermore, it is also reported that one in five high school students in the Philippines, or about 19.7%, has reached the lowest level of mathematics (level 2). In light of the study undertaken, the rank of the Philippines in TIMSS will be higher than the 34th place, and in math literacy, students may have a higher average score in the OECD, if pre-recorded lessons and home tutorials are given to the students by the teachers. The pre-recorded lesson and home tutorial may promote convenience for students to learn since teachers assure that the lessons presented are easy to understand by the students. Consequently, students may perform better in Mathematics through pre-recorded lessons and home tutorials.

Role of Teachers in the Academic Success of the Students

Lynch (2019) discovered that teachers play an integral role in the academic success of all children they teach. For learners who are facing academic failure/or whose academic potential is low, it is vital that they play an even more dominant role. Indeed, this is not an easy task in a classroom full of other students who need the help and guidance of a teacher. An additional challenge for many teachers is how to effectively deal with differences in student culture and socio-economic status. Such differences can include learning, social style, and communication skills, and the gaps that can occur between teachers and students can be frustrating and even overwhelming. However, with the right support from colleagues and administrators, teachers can greatly increase their chances of reaching their students, which in turn increases their chances of success in their studies. In light of the study undertaken, pre-recorded and home tutorial, teachers may be able to play their role in the academic success of the students. Pre-recorded lessons and home tutorials may meet students' needs in understanding specific lessons, such as Mathematics. Despite the different intellectual capabilities of students, pre-recorded lessons and home tutorials may provide the students' needs in learning. These may be appropriate for individual differences. Consequently, academic success in Mathematics among students may be possible. Thus, the role of teachers in the academic success of students may be observed through pre-recorded and home tutorials.

Furthermore, according to Moustafa et al. (2013), the role of teachers in constructivist classes is to promote and embrace student autonomy and create a comfortable atmosphere for students to represent people who act as student guideposts. In light of the study undertaken, giving pre-recorded lessons by the teachers to the students may promote autonomy and create a comfortable atmosphere for them since students may understand the lesson on their own somehow. They may have the chance to be independent learners since students may watch it at their convenience and understand it on their own.

Moreover, Tamim and Grant (2013), enhancer, extender, initiator, and navigator are the four roles of teachers identified. For example, teachers need to take over or take over the role of moderator and education manager in different types of student-centered classes. Keiler (2018) also explained to students the role and identity of

teachers. In light of the study undertaken, pre-corded lesson, and home tutorial, teachers may be able to show the roles of becoming an enhancer, extender, initiator, and navigator. Consequently, Sin (2019) points out that having a teacher in a student's life can boost student morale and make it more valuable in life. In light of the study undertaken, the pre-recorded lesson and home tutorial may have a positive effect on the academic performance of the students. Thus, it may boost student morale and make this more valuable in their lives.

The Relevant Learning Modalities for Students

According to a report by Malipot (2020), the Department of Education (DepEd) is currently conducting distance learning at the basic education level. Students can choose from several learning modalities, including modular (printing or digitizing), online learning, radio, and television-based lessons, and combination (blended learning). According to Dep. Ed, of all the options for teaching content, printed modules were the preferred choice for students and parents. However, due to the high cost and negative environmental effects of printed self-learning modules, Secretary of Education Leonor Briones claimed that this option is not very sustainable. Cabual (2021) showed the preferred learning modality was the self-learning module (module printout) and achieved the highest percentage at 66.67 percent. In most of the schools' preferred modular learning modality, students are more responsible for learning, and in light of the study undertaken, pre-recorded lessons and home tutorials may be given by the teachers to assist students in learning.

The Importance of Pre-Recorded Lessons

According to a report by Malipot (2020), the Department of Education (DepEd) is currently conducting distance learning at the basic education level. Students can choose from several learning modalities, including modular (printing or digitizing), online learning, radio, and television-based lessons, and combination (blended learning). According to DepEd, of all the options for teaching content, printed modules were the preferred choice for students and parents. However, due to the high cost and negative environmental effects of printed self-learning modules, Secretary of Education Leonor Briones claimed that this option is not very sustainable. Cabual (2021) showed the preferred learning modality was the self-learning module (module printout) and achieved the highest percentage at 66.67 percent. In most of the schools' preferred modular learning modality, students are more responsible for learning, and in light of the study undertaken, pre-recorded lessons and home tutorials may be given by the teachers to assist students in learning.

Kyaw (2021) found that pre-recorded videos usually improve student learning, according to a study recently published in the American Educational Research Association (AERA) peer-review journal *Review of Educational Research*. This study analyzed 105 past randomized studies involving a total of 7,776 students and compared the effects of video on learning with those of other educational media, including face-to-face lectures and assigned readings. As a result, using video instead of other teaching methods slightly improved student learning, and using video on top of other teaching methods showed greater improvement. According to research, a video was more suitable for giving skills than knowledge. In light of the study undertaken, pre-recorded videos are one of the pre-recorded lessons. Whatever pre-recorded lesson it is, it may assist students in learning. There is a high possibility that pre-recorded lessons may improve learning among students. Besides, using pre-recorded lessons may serve as the most effective way of teaching. Thus, students may have better academic performance overall.

Furthermore, Sinha et al. (2014) stated that watching video lectures in a large electronic learning course proved to be the main activity of the learner. Video Lectures provide different system interaction capabilities to complement content transmitted through different formats of both auditory and visual media (Alraimi et al., 2015). Media usage can be the most prominent aspect of video lectures. This is because it allows most forms of education and learner interaction in which electronic learning cannot exist. In light of the study undertaken, the pre-recorded lesson may be viewed by the students at their convenient time. Because both auditory and visual input was used, it may provide different system interaction capabilities. It also contributes to how students perceive the lecture and ultimately how cognitive process information is communicated to them (Mayer, 2014). In light of the study undertaken, the pre-recorded lesson may contribute to the lectures of the lesson, and students may be able to grasp the information. The use of media applications in video lectures enables students to process the information they have received both visually and audibly. This process is done by organizing the information in working memory and transferring it to long-term memory. In theory, this ought to result in a bigger schema and, in the end, a better comprehension of the content (Mayer, 2014). In light of the study undertaken, pre-recorded lessons may provide the students with the needed information to understand specific lessons.

Moreover, various forms of visual media designed to raise student awareness and involvement during video lectures include illustrations, images, graphics, maps, animations, videos, slides, and texts (Kizilcec et al., 2015). Pre-recorded lesson may have different visual media such illustrations, images and other visual media. Auditory media are designed to encourage student involvement through forms such as music, sound effects, spoken language, teacher voices, and narration (Mayer, 2014). In light of the study undertaken, pre-recorded lessons may also have different auditory media, such as music, sound effects, and other auditory media. In addition, effective delivery of auditory media provides linguistic information that learners can process efficiently, emphasizes such information, and draws the attention of the learners through non-verbal sounds and music (Costley & Lange, 2017). In light of the study undertaken, the pre-recorded lesson may provide linguistic information and may have non-verbal sounds and music to ensure learning occurs among students. Therefore, using visual and auditory media in video lectures has obvious benefits. Online teachers need to consider potential issues with inefficient media delivery.

However, information transfer problems arise when the media is communicated in a way that limits concentration, attention, interest, involvement (Curry, n.d.) and overloads working memory (Mayer, 2014). In light of the study undertaken, the pre-recorded lesson may have problems in providing information if it consists of unnecessary content. The use of ineffective media is said to contribute to interest, involvement, and motivational issues, and ultimately to a lack of understanding in the electronic learning environment (Costley & Lange, 2017). In light of the study undertaken, the pre-recorded lesson may be ineffective if not properly created. For instance, the negative impact on learning results from either a loss of concentration on the content or a problem associated with trying to process the content (Molnar, 2017). Thus, pre-recorded lesson may be insufficient in learning by the students.

Home Tutoring: Benefits and Challenges

(Bento & Ribeiro, 2013) stated that all parents in Malaysia have a common goal for their children. It is about ensuring that children get the best grades in the school curriculum. Parents actively invest in out-of-school educational activities to improve the school performance of their children. In light of the study undertaken,

home tutorial may be considered by parents to have a better academic performance for their children. In fact, home tutoring is the best option for private complementary educational activities to improve the educational performance of the children (Rahim et al., 2020).

Rahim et al. (2020) listed several advantages of home tutoring, including individualized attention, improved communication skills, increased focus and relaxation, direct observation, and convenience. In light of the study undertaken, students may have a better academic performance when home tutorial is being done. However, the study of Walker (2017) stated the challenges of home tutoring, such as lack of motivation, stress and anxiety, bad behavior, laziness, problems in acquiring new knowledge, and pressured parents. In light of the study undertaken, these may be the reasons why home tutorials among students may have a negative effect on the academic performance of the students. Thus, home tutorials by the teachers may have benefits and challenges.

Scope and Limitations

The main purpose of the study is to determine whether a pre-recorded lesson and a home tutorial session as interventions by the teachers increase the academic performance in mathematics of grade 11 students. The specific objectives of the study are to:

1. Determine the pre-test results of students before giving pre-recorded lessons and home tutorial sessions.
2. Determine the post-test results of students after giving pre-recorded lessons and home tutorial sessions.
3. Evaluate and analyse if there is a significant difference in the pre-test and post-test results of the students before and after giving pre-recorded lessons and home tutorial sessions?
4. Determine the implications of the results on the learning process of the students.

Methodology

The study employed descriptive research utilizing a quantitative approach through the comparative method to determine if there was a significant difference between the pre-test and post-test results of the students before and after giving pre-recorded lessons and home tutorial sessions. In fact, the school included in this study was Jomalig National High School, located in Brgy. Talisoy, Jomalig, Quezon. This institution provided only a senior high school (SHS) in Jomalig, Quezon, where the respondents in this study were grade 11 students, specifically students who enrolled in the General Academic Strand (GAS). The respondents of the study were the 32 Grade 11 students of Jomalig National High School who took General Academic Strand (GAS) during the first semester of the school year 2021–2022. In fact, there were two sections at Jomalig National High School that were currently taking GAS. However, only one section was chosen by the researcher for this study. Thus, the respondents were chosen purposefully.

Parental consent was requested by the researcher from the parents of the respondents. Then, the researcher sent a request for a consent letter and approval to the district supervisor. In fact, a duplicate of the signed letter was forwarded to the Division of Quezon Office for final approval by the Division Superintendent. All of this was done by following safety protocols.

For conducting the pre-test and post-test of this study, the researcher prepared a draft of the test as a research instrument and as the primary source of information. Two lessons were covered in the pre-test and post-test exams in accordance with the most essential learning competencies. The instruments went through content validation by the Public Schools Division Supervisor of the Jomalig district, Dr. Sharon A. Villaverde. Another validator was a doctoral student who was currently studying at the Manuel S. Enverga University Foundation named Maam Earludgin B. Torrente. The instrument was revised to improve the content, and the result was valid and reliable before the administration of the instrument. Suggestions, corrections, and comments from the adviser were taken into consideration in making the final draft of the instrument. Moreover, the research instruments underwent pilot testing and reliability testing to be more credible. Grade 12 students studying at Jomalig National High School were involved in the pilot testing. Using split-half analysis, the correlation coefficient was high, which means high reliability. Thus, after the validation of the instruments, pilot testing, and reliability testing, the instruments were used in the study.

The researcher went to the place of the respondents to get permission from the barangay chairman to conduct the study formally and legally. After the approval of the permission, the researcher conducted the pre-test exam in a limited face-to-face setting, following the safety protocols. Then, after the pre-test exam, the researcher gave the pre-recorded lesson as one of the interventions. One week after the pre-test examination, a home tutorial session followed to continue the interventions. Afterward, a post-test exam was conducted through limited face-to-face contact, again following the safety protocols. In fact, limited face-to-face interaction in conducting the pre-test and post-test avoided cheating among the respondents since the researcher was present in the activity. Thus, the result was valid and reliable.

The researcher was eager to determine if there was a significant difference in the pre-test and post-test results of the students before and after giving pre-recorded lessons and home tutorial sessions.

Results and Discussion

The findings of the study revealed that there were notable and significant differences between the pre-test and post-test scores of the students involved in the interventions. The pre-test and post-test data revealed a mean of 12.25 and 26.5312, respectively. The data also revealed a computed t-value of 24.52165006 and a p-value of 3.66137E-22 at the 0.05 level of significance, which shows that there is a significant difference in the pre-test and post-test scores of the students while giving the pre-recorded lesson and home tutorial session. Consequently, giving pre-recorded lessons and home tutorial sessions had a massive effect on the academic performance in mathematics of grade 11 students. Thus, giving a pre-recorded lesson and a home tutorial session enhanced the academic performance of grade 11 students in mathematics.

t-Test: Paired Two Sample for Means		
	Pre-Test Scores	Post-Test Scores
Mean	12.25	26.53125
Variance	12.38709677	5.998991935
Observations	32	32
Pearson Correlation	0.436889182	

Hypothesized Mean Difference	0	
df	31	
t Stat	-24.52165006	
P(T<=t) one-tail	3.66137E-22	
t Critical one-tail	1.695518783	
P(T<=t) two-tail	7.32274E-22	
t Critical two-tail	2.039513446	

Conclusions

Based from the findings, the following conclusions were derived:

1. Students learn better during pre-recorded lessons and home tutorial sessions.
2. The home tutorial sessions for the students must always consider the safety protocols during a pandemic.
3. A pre-recorded lesson must always be provided in conjunction with a home tutorial session.
4. Activities for the students that involve parents promote harmonious relationships that have a positive effect on students learning and skill development.

Recommendations

Based on the findings and research conclusions, this study proposed the following recommendations:

1. Students may give more time to watching pre-recorded lessons and take seriously the home tutorial sessions given by the teachers.
2. Teachers may be completely committed, focused, and resolute to their responsibilities, especially in giving interventions such as pre-recorded lessons and home tutorial sessions, in order to meet the demands of students, especially during this pandemic.
3. Teachers may constantly ensure that students learn a certain lesson in various areas through various interventions, such as pre-recorded and home tutorial sessions.
4. To achieve a harmonious relationship with parents, teachers may take seriously the home tutorial sessions with students that have a positive effect on learning.

References

- Alraimi, K. M., Zo, H., & Ciganek, A. P. (2015). Understanding the MOOCs continuance: The role of openness and reputation. *Computers & Education*, 80, 28-38. <https://doi.org/10.1016/j.compedu.2014.08.006>
- Atanasova-Pacemska, T., Lazarova, L., Arsov, J., Pacemska, S., Trifunov, Z., & Kovacheva, T. (2015). Attitude of secondary students towards Mathematics and its relationship to achievement in Mathematics. *In Proceeding*

- from the *International Conference on Information Technology and Development of Education–ITRO*, 7, 109-114. Retrieved from <http://bit.ly/2W2qT89>
- Bento A. & Ribeiro, M. (2013). The phenomenon of private tutoring: Implications for public education. *Global Education Review*, 1(5), 70-74. https://www.researchgate.net/publication/277134911_The_phenomenon_of_private_tutoring_Implications_for_public_education
- Bibon, M. B. & Barcenas, J. A. (2021). Coping Mechanism of Island School Students on the Problems Encountered in Modular Distance Learning. www.researchgate.net/publication/353862549
- Cabual, R.A. (2021). Learning styles and preferred learning modalities in the new normal. *Open Access Library Journal*, 8, 1-14. <https://doi.org/10.4236/oalib.1107305>
- Centre for Education Statistics and Evaluation (2015). The effectiveness of tutoring interventions in mathematics for disadvantaged students. <https://nla.gov.au/nla.obj-2575681055/view-of-tutoring-interventions-in-mathematics-disadvantaged-students>
- Chen, L., Bae, S., Battista, C., Qin, S., Chen, T., Evans, T. & Menon, V. (2018). Positive attitude toward Math supports early academic success: Behavioral evidence and neurocognitive mechanisms. *Psychological Science*, 29(3), 390-402. <https://doi.org/10.1177/0956797617735528>
- Costley, J., & Lange, C. H. (2017). The effects of lecture diversity on germane load. *International Review of Research in Open and Distributed Learning*, 18(2), 27-46. https://www.researchgate.net/publication/315808568_The_Effects_of_Lecture_Diversity_on_Germane_Load
- Curry, C., Bernard, A., & Kolek, T. (n.d.). IQP: An investigation on the effect of interactive multimedia video on student engagement and learning. Retrieved from http://web.wpi.edu/Pubs/E-project/Available/E-project-052311192512/unrestricted/IQPA_n_Investigation_on_the_Effect_of_Interactive_Multimedia_Video_on_Student_Engagement_and_Learning.pdf
- Department of Education. (2019). PISA 2018 National report of the Philippines. Retrieved from <https://www.deped.gov.ph/wp-content/uploads/2019/12/PISA-2018Philippine-National-Report.pdf>
- Department of Education. (2020). *Suggested strategies in implementing distance learning delivery modalities for school year 2020-2021*. <https://region8.deped.gov.ph/wp-content/uploads/2020/07/RM-s2020-393.pdf>
- Department of Education. (2020). *Guidelines on the engagement of services of learning support aides to reinforce the implementation of the basic education learning continuity plan in time of COVID-19 pandemic*. https://www.deped.gov.ph/wp-content/uploads/2020/10/DO_s2020_032-1-1.pdf
- Ebele, U. F., & Olofu, P. A. (2017). Study habit and its impact on secondary school students' academic performance in Biology in the Federal Capital Territory, Abuja. *Educational Research and Reviews*, 12(10), 583-588. <https://doi.org/10.5897/ERR2016.3117>
- Kizilcec, R. F., Bailenson, J. N., & Gomez, C. J. (2015). The instructor's face in video instruction: Evidence from two large-scale field studies. *Journal of Educational Psychology*, 107(3), 724-740. <https://stanfordvr.com/mm/2015/kizilcec-jep-instructors-face.pdf>
- Gueta, M. F., & Janer, S. S. (2021). Distance learning challenges on the use of self-learning module. *United International Journal for Research & Technology*, 02(07), 58-71. <https://uijrt.com/articles/v2/i7/UIJRTV2170010.pdf>
- Hattie, J. (2017). Updated List of Factors Influencing Students' Achievement. *Corwin Visible Learning*. Retrieved from <http://www.visiblelearningmetax.com/Hisola>
- Karjanto, N. (2017). Attitude toward mathematics among the students at Nazarbayev University Foundation Year Programme. *International Journal of Mathematical Education in Science and Technology*, 48(6), 849-863. <https://doi.org/10.1080/0020739X.2017.1285060>
- Keiler, L.S. (2018). Teachers' roles and identities in student-centered classrooms. *IJ STEM Ed*, 5(34), 1-20. <https://doi.org/10.1186/s40594-018-0131-6>
- Kyaw, A. (2021). *Pre-recorded prove more effective for student learning than in-person instruction*. <https://www.diverseeducation.com/covid19/article/15108673/study-pre-recorded-videos-prove-more-effective-for-student-learning-than-in-person-instruction>

- Lynch, M. (2019). *How teachers can help all students succeed*. <https://www.theedadvocate.org/how-teachers-can-help-all-students-succeed/>
- Macha, W., Mackie, C., & Magaziner, J. (2018). Education in the Philippines. *World Education News + Reviews*.
- Mayer, R. E. (2014). Incorporating motivation into multimedia learning. *Learning and Instruction*, 29, 171-173.
- Molnar, A. (2017). Content type and perceived multimedia quality in mobile learning. *Multimedia Tools and Applications*, 76(20), 21613-21627. https://www.researchgate.net/publication/309192977_Content_Type_and_Perceived_Multimedia_Quality_in_Mobile_Learning
- Moustafa, A., Ben-Zvi-Assaraf, O., & Eshach, H. (2013). Do junior high school students perceive their learning environment as constructivist? *Journal of Science Education and Technology*, 22(4), 418-431.
- Odori, O. E. (2015). Relationship of study habits with mathematics achievement. *Journal of Education and Practice*, 6(10), 168-170. Retrieved from <http://bit.ly/2GAAR3I>
- Sakirudeen, O. A., & Sanni, B. K. (2017). Study habits and academic performance of secondary school students in mathematics: A case study of selected secondary schools in uyo local education council. *Istraživanja u pedagogiji*, 7(2), 283-297. <https://doi.org/10.17810/2015.65>
- Sinha, T., Jermann, P., Li, N., & Dillenbourg, P. (2014). Your click decides your fate: Inferring information processing and attrition behavior from MOOC video clickstream interactions. <https://arxiv.org/abs/1407.7131>
- Tamim, S. R., & Grant, M. M. (2013). Definitions and uses: Case study of teachers implementing project-based learning. *Interdisciplinary Journal of Problem-Based Learning*, 7(2), 72-101. <https://doi.org/10.7771/1541-5015.1323>.
- Walker, S. (2017, November 01). 6 Challenges Tutors Face (And How to Overcome Them). <https://tutorful.co.uk/blog/6-challenges-tutors-face-and-how-to-overcome-them>