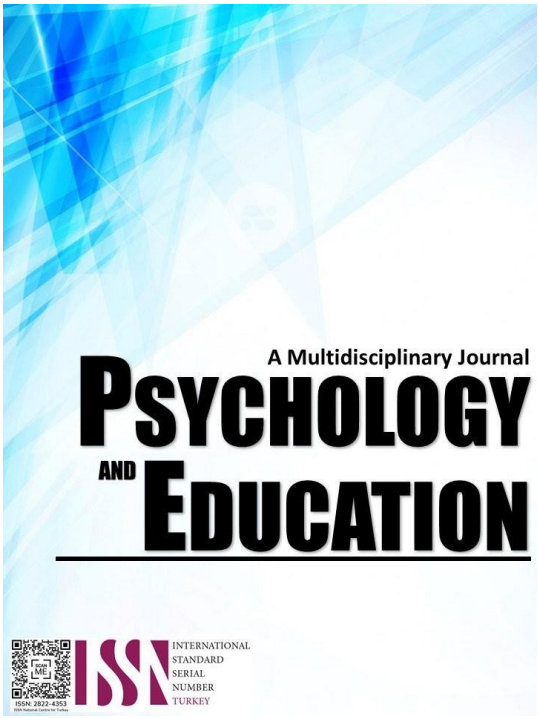
DIGITAL MODULAR DISTANCE LEARNING PRACTICES AND LEARNERS' SCIENCE PERFORMANCE



PSYCHOLOGY AND EDUCATION: A MULTIDISCIPLINARY JOURNAL

Volume: 22
Issue 8
Pages: 947-956
Document ID: 2024PEMJ2111
DOI: 10.5281/zenodo.13124642
Manuscript Accepted: 03-25-2024

Psych Educ, 2024, **22**(8): 947-956, Document ID:2024PEMJ2111, doi:10.5281/zenodo.13124642, ISSN 2822-4353

Research Article

Digital Modular Distance Learning Practices and Learners' Science Performance

Daphne Irish L. Gamorot*, Teresita B. Sambo
For affiliations and correspondence, see the last page.

Abstract

The main objective of this study was to determine the correlation between digital modular distance learning practices and Science performance among Grade 8 learners of Marcela T. Mabanta National High School during the school year 2021-2022. A descriptive-correlational research design was employed. Out of the 262 grade 8 learners, 100 of this population were the respondents of the study which was composed of 48 males and 52 females. This study used a researcher-made questionnaire as a tool. Frequency, ratio and percentages, weighted mean, mean percentage score, and Pearson Product Moment Correlation were used in the analysis of data. The consolidated results of the study elaborated that the learner-respondents achieved a satisfactory Science performance in this pandemic school year. The study revealed that there was a significant relationship between the learners' digital modular distance learning practices (in terms of performance/autonomous learning, coordination, and organization which yielded 0.000 levels of significance) and Science performance. A proposed intervention program for learners, parents, and teachers on digital modular distance learning practices was crafted for implementation.

Keywords: *digital modular distance learning practices, learners' science performance*

Introduction

The COVID-19 outbreak which was first identified in December 2019 in Wuhan, China has made the largest global interruption including the educational systems, affecting a huge number of learners. It has radically changed the education landscape and turned out to be a public health emergency of international concern. With the alarming increase in COVID-19 cases and deaths worldwide, the health department has cautioned the public to take appropriate precautions and follow the advice provided by the local health authority. Lockdowns, hand washing, social distancing, and wearing of face mask and face shield are just some of the strategies to flatten the curve and control the disease transmission.

Furthermore, the global pandemic has resulted in widespread disruptions such as worldwide economic recession, travel restrictions, and school closure. Temporary closures of schools, colleges, and universities have been mandated in most countries. This is in an attempt to contain the spread of the virus and reduce infections. Face-to-face classes and other related school activities have been suspended. At present, our country is in the process of embracing the new normal form of education. Thus, in the face of global educational closures, there is a compelling need to innovate and implement alternative educational and assessment strategies. To ensure continuity of learning amidst pandemic, the Department of Education has implemented distance learning modalities as an alternative to face-to-face instruction under DepEd Order No. 012, series 2020. Our country has adopted modular systems to deliver education while prioritizing the safety of the learners (DepEd, 2020).

Since face-to-face teachings have been canceled, educational institutions have been compelled to shift from in-person learning to modular distance learning. This abrupt switch has been particularly stressful for many teachers and learners who prefer face-to-face instruction. In addition, one viable way to continue learning in this time of quarantines and lockdowns is distance learning wherein the learner and the teacher are physically remote from each other. Modular Distance Learning, Online Distance Learning, and Television/Radio-Based Instruction are the types of distance learning modalities. Parents mostly preferred modular learning based on a survey conducted by the Department of Education. This modality is used by public schools since not all are capable of online learning.

Besides, the Department of Education has stressed educational concerns after the country's low ranking in the Program for International Student Assessment (PISA) was released on December 3, 2019. Results of the PISA 2018, which compared the quality of basic education of the seventy-nine (79) member and partner countries of the Organization for Economic Co-operation and Development (OECD), showed the Philippines' ranking at the bottom for performance in reading, and second-lowest for both Mathematics and Science (Ciriaco, 2019).

In addition, the difficulties of learning Science are related to the nature of Science itself. These are methods by which Science is customarily taught without regard to what is known about children's learning (Johnstone, 1991).

In the context of Marcela T. Mabanta National High School, Self-Learning Modules (SLM) based on the most essential learning competencies (MELCS) provided by DepEd has been utilized and uploaded on a tablet. The Local Government Unit of the Municipality of Kauswagan provided learners with tablets as an educational tool to support learning. Hence, Marcela T. Mabanta NHS has adopted Digital Modular Distance Learning (DMDL) as a learning delivery modality. Learners received instructions in their respected homes guided by their parents or guardians. This was the vital role of parents as home facilitators. They were going to receive and return Self-Learning Modules (SLMs) as well as answer sheets from and to school based on the agreed schedule.

The challenges of this paradigm shift were quite tough for the teachers, learners, and even parents. The teacher uploaded self-learning

modules on the tablet which were delivered to the learners on weekly basis. They also monitored the progress of the learners, provided assistance and remediation as well as conducted home visits to learners needing remediation. As for the learners, they needed to adjust also from this sudden shift in education. They may ask the teacher for assistance through e-mail, call, text message, chat among others. Moreover, the learners must organize their tasks and develop time management skills while attending to their household chores and completing modular tasks at the same time. Besides, to make learning possible, an active parent engagement is essential. Parent-Teacher partnership is vital in a shared responsibility to help learners learn and meet educational goals amidst pandemics.

Along with this context, the researcher conducted a study that determined the relationship between learners' digital modular distance learning practices with their Science performance. This study resorted to finding out the link between the said variables. The above-mentioned factors contributed to the researcher's motivation to conduct the study in Marcela T. Mabanta National High School for the school year 2021-2022 which relates to her field of specialization. The researcher is a public junior high school Science teacher for eight years at Marcela T. Mabanta National High School in the Division of Lanao del Norte.

The study would be of such great importance to the holistic development of the youth specifically in the aspect of giving learners good intervention to enhance their Science performance. It may also uplift the School-Based Management Level of practice. The findings would serve as the basis for the development of an intervention program to strengthen the role of teachers, learners, and parents in achieving educational goals in situations when face-to-face classes with the teachers are not possible. It was also her hope and wish that this study would help Science teachers to innovate and create ways of improving the quality of teaching and learning in our secondary schools amidst pandemics.

Research Questions

The main thrust of the study was to examine the link between grade eight learners' digital modular distance learning practices and Science performance in the new normal at Marcela T. Mabanta National High School during the school year 2021-2022. Specifically, this sought to answer the following questions.

1. What is the socio-economic profile of the learners in terms of:
    1.1. age,
    1.2. gender,
    1.3. father's educational attainment,
    1.4. mother's educational attainment, and
    1.5. monthly family income?
2. What is the level of learners' digital modular distance learning practices in terms of:
    2.1. performance/autonomous learning,
    2.2. coordination,
    2.3. organization, and
    2.4. securing and submission of modules?
3. What is the Science performance of the learner-respondents?
4. Is there a significant relationship between the respondents' socio-economic profile and their Science performance?
5. Is there a significant relationship between the learners' digital modular distance learning practices and Science performance?
6. What intervention program on digital modular distance learning practices can be proposed based on the findings of the study?

Methodology

Research Design

In this study, the descriptive-correlational research design was employed. Descriptive design was used to determine the socio-economic profile of the respondents as well as their digital modular distance learning practices and their Science performance. On the other hand, the correlation was used to determine the significant relationship between the respondents' socio-economic profile and Science performance as well as the significant relationship between the respondents' digital modular distance learning practices and Science performance.

Respondents

There were five (5) sections for grade eight learners in Marcela T. Mabanta NHS for the school year 2021-2022. The target respondents of this study were the grade eight learners of Marcela T. Mabanta NHS from sections Sardonyx and Topaz in the said school year. All the learners from sections Sardonyx and Topaz who were utilizing tablets were taken. These learners were chosen to be the participants of the study since the researcher is currently the Science teacher of the above-mentioned sections in grade eight. A total of 100 grade eight learners were the respondents of the study which was composed of 48 males and 52 females. This population was purposefully selected for the conduct of the study to provide the researcher with necessary and pertinent information deemed necessary for the completion of this research study.

Table 1. *Population Distribution of Grade Eight Learners*

Section	*Population*		
	Male	*Female*	*Total*
Jasper	27	35	62
Moonstone	28	29	57
Sardonyx	27	30	57
Topaz	21	22	43
Turquoise	18	25	43
Total	121	141	262

Note: Target Respondents – Sardonyx and Topaz

Instruments

A researcher-made questionnaire was used to gather data on the modular distance learning practices by the students participating in the study. To validate the questionnaire, it was pilot tested in section Jasper of the same school and yielded encouraging results. The results indicated that the instrument can be applied with a Cronbach's Alpha reliability range of .75 and above. The questionnaire was submitted to the adviser for suggestions and comments before it was finalized. The researcher reproduced the final copies for the grade eight learners after the approval and validation of the instrument.

Part I of the research instrument covered the socio-economic profile of the learners in terms of age, gender, father's educational attainment, mother's educational attainment, monthly family income, and average grade in Science.

Part II of the research instrument dealt with the respondents' level of digital modular distance learning practices in terms of performance/autonomous learning, coordination, organization, and securing and submission of modules. For every learning practice, 5 items were answered by the respondents. The digital modular distance learning practices were on a Likert Scale with the following points for scoring purposes: 4 points for Always, 3 points for Often, 2 points for Sometimes, and 1 point for Never. Moreover, statements were translated in Filipino to address diverse cultures and develop a better understanding to gather reliable responses from the participants.

Procedure

Digital modular distance learning featured individualized instruction allowing learners to use self-learning modules (SLMs) in print or digital format applicable to the learners. The researcher administered the distribution and retrieval of questionnaires in collaboration with the advisers through the parents during the distribution of Self-Learning Modules and answer sheets. To facilitate the gathering of data, permissions to conduct the study were obtained from the school's division superintendent, principal, and parents of the respondents. All the communications were signed and approved by the concerned personalities including the administrative personnel of St. Peter's College. During the distribution and retrieval of questionnaires, the researcher and other persons involved practiced health and safety protocol at all times. Confidentiality of their responses was assured by the researcher.

Parents/guardians of the grade eight learners were oriented as to how to fill out the questionnaire since they were present during the distribution of Self-Learning Modules and answer sheets. They affixed their signatures in the informed consent form. The adviser clearly explained to these parents/guardians how to administer the questionnaires following health and safety guidelines mandated by the Inter-Agency Task Force of the Department of Health. The questionnaires were retrieved after one week. The results were consolidated, organized, tallied, and tabulated for analysis.

Data Analysis

Data were tabulated and interpreted to acquire the needed actual information.

The following statistical techniques were employed to answer the different problems presented:

For problem 1, Frequency, Ratio and Percentages were used to determine the socio-economic profile of the learners in terms of age, gender, father's educational attainment, mother's educational attainment, and monthly family income.

For problem 2, Weighted Mean was used to determine the level of learners' digital modular distance learning practices in terms of performance/autonomous learning, coordination, organization, and securing and submission of modules.

For problem 3, the Mean Percentage Score in the new normal based on DepEd criteria was used to determine the Science performance of learner-respondents.

For problems 4 and 5, Pearson Product Moment Correlation was used to determine the significant relationship between the respondents' socio-economic profile and Science performance as well as the significant relationship between the respondents' digital modular distance learning practices and Science performance.

Results and Discussion

This section discusses the data that are shown in the tables. The data were analyzed and supported by related literature or studies.

Problem 1. What is the socio-economic profile of the learners in terms of age, gender, father's educational attainment, mother's educational attainment, and monthly family income?

Table 2. *Learners' Age*

Age	*Frequency*	*Percentage*
12 - 13 years old	35	35.00
14 - 15 years old	51	51.00
16 – 17 years old	11	11.00
18 years old & above	3	3.00
Total	100	100.00

Table 2 illustrates the profile of learners in terms of age, frequency, and percentage. The results revealed that the highest number of respondents in terms of age was between 14 and 15 years old, while the lowest number of respondents were 18 years old and above. This implied that the ages of the respondents were appropriate for junior high school and only a few were overage. Learners in secondary education under the K to 12 programs were generally from 12 to 17 years old (DepEd, 2019).

Table 3. *Learners' Gender*

Gender	*Frequency*	*Percentage*
Male	48	48.00
Female	52	52.00
Total	100	100.00

Table 3 shows the distribution of the learners according to their gender. It revealed that 48 out of 100 or 48% were males and 52 out of 100 or 52% were females. It implied further that the number of male respondents was almost equal to the number of female respondents.

Table 4. *Educational Attainment of Learners' Fathers*

Educational Attainment	*Frequency*	*Percentage*
Elementary Level	26	26.00
Elementary Graduate	26	26.00
Secondary Level	17	17.00
Secondary Graduate	15	15.00
College Level	8	8.00
College Graduate	8	8.00
Total	100	100.00

As shown in Table 4 the distribution of the learners according to their fathers' highest educational attainment revealed that the majority of the educational attainments of the respondents' fathers were elementary level and graduate. Most of the fathers of the respondents were more likely to believe that they needed to belong to the workforce after graduating elementary and even elementary level.

Table 5. *Educational Attainment of Learners' Mothers*

Educational Attainment	*Frequency*	*Percentage*
Elementary Level	14	14.00
Elementary Graduate	24	24.00
Secondary Level	28	28.00
Secondary Graduate	24	24.00
College Level	8	8.00
College Graduate	2	2.00
Total	100	100.00

As shown in Table 5, the distribution of the learners according to their mother's highest educational attainment revealed that the majority of the respondents' mothers were secondary level. These mothers were more likely did not pursue further their education to get their desired careers considering a variety of barriers and challenges like social attitudes towards education and impoverishment.

Table 6. *Learners' Family Monthly Income*

Position	*Frequency*	*Percentage*
5,000.00 – 6,000.00	68	68.00
7,000.00 – 8,000.00	13	13.00
9,000.00 – 10,000.00	15	15.00
11,000.00 & above	4	4.00
Total	100	100.00

Table 6 shows the distribution of the learners according to their monthly income. It revealed that the majority of the respondents had a monthly income of 5,000.00 – 6,000.00. Their families held jobs belonging to these pay rates. This meant that these families had a monthly family income of below 10,957 which was categorically poor or low-earner families (PSA, 2019). It further revealed that the majority of the learner respondents were from economically challenged families.

Problem 2. What is the level of learners' digital modular distance learning practices in terms of performance/autonomous learning, coordination, organization, and securing and submission?

Table 7. *Level of Learners' Digital Modular Distance Learning Practices in Terms of Performance/Autonomous Learning*

Performance/Autonomous Learning	*Weighted Mean*	*Remarks*
PAL 1: I wake up early to ensure the completion of my modular activities of the day.	3.01	Often
PAL2: I allotted 4 hours a week for answering Science modules.	2.91	Often
PAL3: I manage my study time efficiently to complete Science written/performance tasks on time.	3.02	Often
PAL4: I can complete Science written/performance tasks independently.	2.94	Often
PAL5: I do not quit just because topics in Science get difficult.	2.95	Often
	Average 2.97	Often

Note: 1.00 – 1.80 Never; 1.81 - 2.50 Sometimes; 2.51 - 3.30 Often; 3.31 - 4.00 Always

As shown in Table 7, the level of learners' digital modular distance learning practices in terms of performance/ autonomous learning showed a weighted mean average of 2.97 which signified that the learners often performed digital modular distance learning practices in terms of performance/autonomous learning. The study revealed that the learners often managed their study time efficiently to complete Science written/performance tasks on time supported by the obtained highest weighted mean of 3.02. On the other hand, the respondents were often allotted 4 hours a week for answering Science modules as implied lowest mean of 2.91. This meant that the respondents were able to manage their study time and allotted 4 hours a week as well to complete their learning tasks in Science.

In a distance learning context, learners acquired studying strategies and habits to master their learning. In this regard, autonomy in distance learning environments attributed a great significance since the alternative educational intervention offered in distance education encouraged learners toward learning autonomy (Andrade & Bunker, 2009).

Table 8. *Level of Learners' Digital Modular Distance Learning Practices in Terms of Coordination*

Coordination	*Weighted Mean*	*Remarks*
CI: I asked questions from my classmates and teachers when I got confused with the lessons in the module.	2.73	Often
C2: I inform my teacher whenever my parent cannot make it to the retrieval/distribution schedule ahead of time.	2.87	Often
C3: I communicate with my teachers and classmates online through email or chat.	3.00	Often
C4: I ask my teacher for an extension in completing my answer sheets if I cannot finish them on time.	2.66	Often
C5: I ask a member of the family to guide/facilitate me in answering the modules.	2.92	Often
	Average 2.84	Often

Note: 1.00 – 1.80 Never; 1.81 - 2.50 Sometimes; 2.51 - 3.30 Often; 3.31 - 4.00 Always

As shown in Table 8, the Level of learners' digital modular distance learning practices in terms of coordination showed a weighted mean average of 2.84 which signified that the learners often performed digital modular distance learning practices in terms of coordination. The study revealed that the learners often communicated with their teachers and classmates online through email or chat supported by the obtained highest weighted mean of 3.00. On the other hand, the respondents often ask their teacher for an extension in completing their answer sheets if they could not finish it on time as implied by the lowest weighted mean of 2.66. This meant that the respondents often communicated with their teachers and classmates online through email or chats and asked their teacher as well for an extension in completing their answer sheets if they could not finish it on time.

The integration of any technology in an open distance and e-learning environment can play a crucial role in providing educational opportunities and access to information using any available device and platforms that can be used at home (Makina, 2020). The use of various social media platforms was considered to effectively create a collaborative learning environment and experience among the learners to improve their academic performance (Manickam et al., 2020).

Table 9. *Level of Learners' Digital Modular Distance Learning Practices in Terms of Organization*

Organization	*Weighted Mean*	*Remarks*
OI: I organize my learning/study space for it to be conducive to learning.	2.88	Often
O2: I see to it that other references like textbooks, learning activity sheets, and gadgets such as a tablet, cellphone, etc. are in their proper place which is needed in answering the Science modules.	2.96	Often
O3: I follow the schedule posted in my learning space in answering the Science modules.	2.90	Often
O4: I organize and balance my time at home to finish both my house chores and module activities.	3.11	Often
O5: I follow activities/directions in the Weekly Home Learning Plan to finish the tasks in the module.	3.12	Often
	Average 3.02	Often

Note: 1.00 – 1.80 Never; 1.81 - 2.50 Sometimes; 2.51 - 3.30 Often; 3.31 - 4.00 Always

As shown in Table 9, the level of learners' digital modular distance learning practices in terms of the organization showed a weighted mean average of 3.02 which signified that the learners often performed digital modular distance learning practices in terms of

organization. The study revealed that the learners often followed activities/directions in the Weekly Home Learning Plan to finish the tasks in the module supported by the obtained highest weighted mean of 3.12. This meant that the learners frequently train themselves to take responsibility for their learning as they follow the prescribed schedule in the plan. On the other hand, the respondents often organized their learning/study space for it to be conducive to learning as the implied lowest weighted mean of 2.88.

Table 10. *Level of Learners' Digital Modular Distance Learning Practices in Terms of Securing & Submission of Modules*

Securing & Submission of Modules	*Weighted Mean*	*Remarks*
SSMI: I remind my parent/guardian to follow health and safety protocol when receiving/returning Science modules and answer sheets.	3.30	Often
SSM2: I remind my parent/guardian to secure and return the modules on time.	3.20	Often
SSM3: I follow my teacher's instructions in answering the modules through my mother during the distribution.	3.22	Often
SSM4: In using the issued tablet, I see to it that I focus on answering the modules and not on online games.	3.22	Often
SSM5: I counter-check the modules and answer sheets after securing and before returning them.	3.39	Always
	Average 3.26	Often

Note: 1.00 – 1.80 Never; 1.81 - 2.50 Sometimes; 2.51 - 3.30 Often; 3.31 - 4.00 Always

As shown in Table 10, the level of learners' digital modular distance learning practices in terms of securing and submission of modules showed a weighted mean average of 3.26 which signified the learners often performed digital modular distance learning practices in terms of securing and submission of modules. The study revealed that the learners often counter-checked the modules and answer sheets after securing and before returning them. It was supported by the highest weighted mean of 3.39. On the other hand, the respondents reminded their parent/guardian to secure and return the modules on time as implied lowest weighted mean of 3.20. This meant that the respondents often counter-checked the modules and answers sheets and reminded their parent/guardian as well to secure and return the modules on time.

Problem 3. What is the Science performance of the learner- respondents?

Table 11. *Learners' Science Performance*

Grade Scale	*Frequency*	*Percentage*	*Descriptors*
90-100	2	2.0	Outstanding
85-89	21	21.0	Very Satisfactory
80-84	72	72.0	Satisfactory
75-79	5	5.0	Fairly Satisfactory
74 and below	0	0	Did Not Meet Expectation
Total	100	100	

Table 11 presents the learner-respondents' Science performance adapting digital modular learning modality based on the average grade obtained. The data implied that almost three-fourths of the respondents obtained a grade scale of 80-84 described as satisfactory. This indicated that the learner-respondents' Science performance was satisfactory. None of the learner-respondents got 74 and below (did not meet expectations). Under Policy Guidelines on Classroom Assessment for the K to 12 Basic Education Program, teachers should ensure that learners received remediation when they would earn raw scores which were consistently below expectations in written work and performance tasks by the fifth week of any quarter to prevent a learner from failing in any learning area at the end of the year (DepEd, 2015). Moreover, the learners' guardians or parents must be informed when a learner's raw scores in written work and performance tasks were consistently below expectations. This would enable them to guide their children to improve and prepare for the quarterly assessment.

Problem 4. Is there a significant relationship between the respondents' socio-economic profile and their Science performance?

Table 12 displays the correlation between the respondents' socio-economic profile and their Science performance. The study exemplified that there was no significant relationship between the ages of the respondents and their Science performance since it yielded a 0.764 level of significance which was higher than the 0.05 level. Thus, the null hypothesis was not rejected. It meant to say that the age of the learners did not affect their Science performance. This was in sync with the observations of Rabgay (2015) that there was no correlation between students' academic performance and age. The study also showed that there was a significant relationship between the gender of the respondents and their Science performance since it yielded a 0.000 level of significance which was lower than the 0.05 level. Thus, the null hypothesis was rejected. Moreover, the results supported the findings of some of the previous studies such as Orabi (2007), Dayioglu and Turut (2007), Khwaileh and Zaza (2010) who had identified significant gender differences in the academic performance of students especially females outperforming their male counterparts.

Meanwhile, the results of the study revealed that there was no significant relationship between the father's educational attainment of the respondents and their Science performance since it yielded a 0.287 level of significance which was higher than the 0.05 level. It implied that whether the fathers' educational attainment was high or low, it did not influence the academic performance of the respondents. Parental education had been frequently associated with improved academic performance (Masud et al., 2015). In a study conducted by Farooq et al. (2011), the factors affecting the academic performance of 600 students in a public school in Pakistan were

described and it resulted in an association between parental education level and academic success. Their results were significant for the educational level of fathers which negated the findings of this study.

Table 12. *Correlation Between the Respondents' Socio-Economic Profile and Science Performance*

Socio-Economic Profile	*Science Performance*		*Remarks*
Age	Pearson Correlation	.030	Not
	Sig. (2-tailed)	.764	Significant
	N	100	
Gender	Pearson Correlation	.462	Significant
	Sig. (2-tailed)	.000	
	N	100	
Father's Educational Attainment	Pearson Correlation	-.108	Not
	Sig. (2-tailed)	.287	Significant
	N	100	
Mother's Educational Attainment	Pearson Correlation	-.202	Significant
	Sig. (2-tailed)	.044	
	N	100	
	Pearson Correlation	-.151	Not
	Sig. (2-tailed)	.135	Significant
	N	100	

**Correlation is significant at the 0.05 level (2-tailed)*
***Correlation is highly significant at the 0.01 level (2-tailed)*

On the other hand, the study showed that there was a significant relationship between the mother's educational attainment of the respondents and their Science performance since it yielded a 0.044 level of significance which was lower than the 0.05 level. Thus, the null hypothesis was rejected. To support this, Chiu and Khoo (2005) reported 15-year-old students' test scores correlated significantly with mothers' mean years of schooling. In addition, mothers' not fathers' years of schooling affected their child's school performance.

Meanwhile, the study revealed that there was no significant relationship between the monthly family income of the respondents and their Science performance since it yielded a 0.135 level of significance which was higher than the 0.05 level. Thus, the null hypothesis was not rejected. A family's income was not the basis for the determined students in enhancing their performance (Adzido et al, 2016). According to Machebe et al. (2017), it was the resiliency of students from poor income families that led to success. A few studies had found little correlation between income and academic achievement (Lacour & Tissington, 2011). This negated the findings of Smith et al. (2002) that parental socio-economic status was a significant predictor of the intellectual performance of children.

Problem 5. Is there a significant relationship between learners' digital modular distance learning practices and Science performance?

Table 13 displays the correlation between the learners' digital modular distance learning practices and Science performance. The study exemplified that there was a significant relationship between the learners' digital modular distance learning practices in terms of performance /autonomous learning and Science performance since it yielded 0.000 level of significance which was lower than the 0.05 level. Thus, the null hypothesis was rejected. This meant that the Science performance of the learners was influenced by their autonomous or independent learning. This was consistent with the studies of Hashemian and Soureshjani (2011) and Tilfarlioglu and Ciftci (2011). They found a significant and positive relationship between academic success and learner autonomy in their studies. On the other hand, the literature showed that insufficient time for study was one of the problems encountered by the students in distance learning (Musingafi et al., 2015).

Table 13. *Correlation Between the Learner's Digital Modular Distance Learning Practices and Science Performance*

Modular Distance Learning Practices	*Science Performance*		*Remarks*
Autonomous Learning	Pearson Correlation	.362	Significant
	Sig. (2-tailed)	.000	
	N	100	
Coordination	Pearson Correlation	.370	Significant
	Sig. (2-tailed)	.000	
	N	100	
Organization	Pearson Correlation	.371	Significant
	Sig. (2-tailed)	.000	
	N	100	
Securing & Submission of Modules	Pearson Correlation	.062	Not Significant
	Sig. (2-tailed)	.539	
	N	100	

**Correlation is significant at the 0.05 level (2-tailed)*
***Correlation is highly significant at the 0.01 level (2-tailed)*

It further showed that there was a significant relationship between the learners' digital modular distance learning practices in terms of coordination and Science performance since it yielded a 0.000 level of significance which was lower than the 0.05 level. Thus, the null hypothesis was rejected. As revealed, the learners' Science performance was affected by their digital modular distance learning practices in terms of coordination. Khan et al. (2017) stated that the success of students was directly related to the effective communication of the teacher. Moreover, researchers had found suggestive evidence of the positive relationship between school-to-family communication and student outcomes (Fan & Williams, 2010; Rumberger, 2011).

The study also showed that there was a significant relationship between the learners' digital modular distance learning practices in terms of organization and Science performance since it yielded a 0.000 level of significance which was lower than the 0.05 level. Thus, the null hypothesis was rejected. This implied that the learners' Science performance was influenced by their digital modular distance learning practices in terms of organization. According to Pintrich (2003), Zimmerman has revealed that self-regulating students, who set goals or plans, and who tried to monitor and control their cognition, motivation, and behavior predicated upon these goals were more likely to do much better in school.

Meanwhile, the study also revealed that there was no significant relationship between the learners' digital modular distance learning practices in terms of securing and submission of modules and Science performance since it yielded a 0.539 level of significance which was higher than the 0.05 level. Thus, the null hypothesis was not rejected. This implied that the learners' digital modular learning practices in terms of securing and submission of modules did not affect their Science performance. In a study conducted by Reyes (2021), the weekly task of the parents, like returning and receiving modules, obtained a strongly disagree response. Parents were never exhausted in regularly visiting the school observing health protocols just to pick up modules intended for that week. Bhamani et al. (2020) added that if the parents and children collaborated to manage the learning activities, their bonding increases as they can spend much time together.

Conclusions

This study aimed to analyze and present the relationship between the grade eight learners' digital modular distance learning practices and Science performance at Marcela T. Mabanta National High School. Studies relating to these variables were included in this study.

Based on the findings, the Science performance of grade eight learners adapting digital modular learning modality can be described as satisfactory in this pandemic school year. The study revealed that there was a significant relationship between the learners' digital modular distance learning practices (in terms of performance/autonomous learning, coordination, organization) and Science performance. Therefore, the researcher concluded that the learners' Science performance was influenced by their digital modular distance learning practices. This implied that the quality of performance in getting high, average or low grades depends on their digital modular distance learning practices. The learners' Science performance can be improved through various interventions including parent engagement.

Based on both the research findings and theoretical framework, it could be argued that digital modular distance learning practices had important impacts on the learners' Science performance.

The researcher, in her desire to find meaning to the effort exerted in this study, submits the following recommendations for possible implementation.

Learners must continue to develop good study habits at the same time develop a positive attitude towards learning amidst pandemics. They must be able to deal with the challenges and overcome the difficulties of shifting to remote learning. Through goal-setting, learners will get motivated resulting in favorable outcomes.

Parents are encouraged to monitor closely their children's learning tasks for progress sustainability and get highly engaged in digital modular distance learning practices of their children. They must consider the importance of communicating with their children's teachers for this matter.

Teachers should regularly attend webinars/workshops to keep updated with the latest trends in improving learners' academic performance and Science teaching. They must be exposed to new strategies in teaching Science starting with ICT integration. To add, teachers can assist parents through social media platforms aside from calls and text.

The school is encouraged to design and implement a parent development program focusing on awareness and strengthening parents' role in modular distance learning.

Future researchers may conduct further research about these incorporating other variables which are not investigated in this study as well as related studies coming from different locales or other schools.

The intervention program should be considered for implementation.

References

Adzido, R. Y. N., Dzogbede, O. E., Ahiave, E., & Dorkpah, O. K. (2016). Assessment of family income on academic performance of

tertiary students: The case of the polytechnic, Ghana. International Journal of Academic Research in Accounting, Finance and Management Sciences, 6(3), 154-169.

Andrade, M. S., & Bunker, E. L. (2009). A model of self-regulated distance language learning. Distance Education. 30(1), 47-61.

Asrar, Z., Tariq, N., & Rashid, H. (2018). The impact of communication between teachers and students: A case study of the faculty of management sciences, University of Karachi, Pakistan. European Scientific Journal.

Bhamani, S., Makhdoom, A. Z., Bharuchi, V., Ali, N., Kaleem, S., & Ahmed, D. (2020). Home learning in times of covid: Experiences of parents. Journal of Education and Educational Development.

Chavan, R. L. (2013). Difficulties encountered by science teachers during teaching concepts of science. ResearchGate.

Chiu, M., & Khoo, L. (2005). Effects of resources, inequality, and privilege bias on achievement: country, school, and student-level analyses. American Educational Research Journal. 2005;42(4):575-603.doi:10.3102/00028312042004575.

Cordon, J. M., & Polong, J. D. B. (2020). Behind the science literacy of Filipino students at Pisa 2018: A case study in the Philippines' educational system. Integrated Science Education Journal (ISEJ).

Dayioglu, M., & Turut, S. (2007). Gender differences in academic performance in a large public university in Turkey. Higher Education.

DepEd. (2020).Guidelines on the required health standards in basic education offices and schools.

DepEd. (2015). Policy guidelines on classroom assessment for the K to 12 basic education.

Dogruer, N., Eyyam, R., & Menevis, I. (2011). The use of the internet for educational purposes. Procedia Social and Behavioral Sciences.

Ean, L. C., & Lee, T. P. (2016). Educational use of Facebook by undergraduate students in Malaysia higher education: A case study of a private university. Social Media and Technology.

Farooq, M. S., Chaudhry, A. H., Shafiq, M., & Berhanu, G. (2011). Factors affecting students' quality of academic performance: A case of secondary school level. J. Qual. Technol. Manag. 7, 1–14.

Grant, Marquis. (2021). Student intervention plan and strategies.

Hashemian, M., & Soureshjani, K. H. (2011). The interrelationship of autonomy, motivation, and academic performance of Persian learners in distance education contexts. Theory and Practice in Language Studies, 1(4), 319-326.

Hebebci, M. T., Bertiz , Y., & Alan, S. (2020). Investigation of views of students and teachers on distance education practices during the coronavirus (COVID-19) pandemic. International Journal of Technology in Education and Science (IJTES).

Johnstone, A. H. (1991). Why is science difficult to learn? Things are seldom what they seem. Journal of Computer Assisted Learning.

Juan, A., Reddy, V., Zuze, T. L., Namome, C., & Hannan, S. (2016). Does it matter whether students enjoy learning science? Exploring student attitude towards science in South Africa. Human Sciences Research Council.

Karadut, A. P. (2012). Effects of Thorndike's theory of connectionism rudiments on developing cello playing skills for beginners. Procedia Social and Behavioral Sciences.

Kwaileh, F., & Zaza, H. (2010). Gender differences in academic performance among undergraduates at the University of Jordan: Are they real or stereotyping? College Student Journal.

Lacour, M., & Tissington, L. D. (2011). The effects of poverty on academic Achievement. Educational Research and Reviews Vol. 6 (7), pp. 522-527.

Layno, A. L. F. (2021). Distance learning as the new learning mode. Deped Bataan .com Publications.

Lehrl, S., Evangelou, M., & Sammons, P. (2020). The home learning environment and its role in shaping children's educational development.

Machebe, C. H., Ezegbede, B. N., & Onuoha, J. (2017). The impact of parental level of income in students' academic performance in high school in Japan. Universal Journal of Education Research, 5(9),1614- 1620.DOI: 10.13189/ujer.2017.050919.

Manickam, Y., Selvam, N. D., & Ahrumugam, P. (2020). A study on the impact of collaborative learning on academic performance using Facebook in higher education. International Journal of Advanced Research in Education and Society, 2(1), 15–23.

Makina, A. (2020). Developing a framework for managing the quality use of podcasts in open distance and e-learning environments. Open Praxis, 12(1), 67.

Masud, H., Thurasamy, R., & Ahmad, M. S. (2015). Parenting styles and academic achievement of young adolescents: A systematic literature review. Qual. Quant. 49, 2411–2433. doi: 10.1007/s11135-014-0120-x.

McLeod, S. (2020). Piaget's theory and stages of cognitive development. Simple Psychology.

Merriam-Webster.com Dictionary, Merriam-Webster. https://www.merriam-webster.com/dictionary/coordination.

Mocon-Ciriaco, C. (2019). Deped vows to improve quality of education after Pisa showing.BusinessMirror.

Narad, A., & Abdullah, B. (2016). Academic performance of senior secondary school students: Influence of parental encouragement and school environment. Rupkatha. Lovely Professional University, Phagwara. Journal on Interdisciplinary Studies in Humanities (ISSN 0975-2935) Special Issue, Vol. VIII, No. 2.

Olowookere, E. I., Alao, A. A., Odukoya, J. A., Adekeye, O. A., & Agbude, G. (2015). Time management practices, character development and academic performance among university undergraduates: Covenant university experience. Creative Education.

Onyema, E. M., Eucheria, N. C., Obafemi, F. A., Sen, S., Atonye, F. G., Sharma, A., & Alsayed, A. O. (2020). Impact of coronavirus pandemic on education. Journal of Education and Practice.

Orabi, I. (2007). Gender differences in student academic performance and attitudes. American Society for Engineering Education.

Perante, L., Solmiano, E. M., Lunesto, J. P., Malicdem, J. A. M., Malaca, J., & Tus, J. (2021). Mag-aral ay di biro: A phenomenological study on the lived experiences of the students on blended learning amidst covid-19. International Journal of Advance Research and Innovative Ideas in Education.

Pintrich, P. R. (2003). A motivational science perspective on the role of student motivation in learning and teaching contexts. Journal of Educational Psychology, vol. 95, no. 4, pp. 667–686.

Rabgay, T. (2015). A study of factors influencing students' academic performance in a higher secondary school in Bhutan. CERD Educational Journal. Vol.16 Issue-2.

Reiss, M. J. (2020). Science education in the light of covid19. Nature Public Health Emergency Collection.

Reyes, R. R. (2021). Parental challenges and school performance of junior high school students in distance learning modality. International Journal of Research in Engineering, Science and Management.

Rotas, E., & Cahapay, M. (2020). From stress to success: Exploring how Filipino students cope with remote learning amid covid-19 pandemic. Journal of Pedagogical Sociology and Psychology.

Sadera, J. R. N., Torres, R. Y. S., & Rogayan, Jr., D. V. (2020). Challenges encountered by junior high school students in learning science: Basis for an action plan. Universal Journal of Educational Research.

Siemens, G. (2005). Connectivism: A learning theory for the digital age. International Journal of Instructional Technology and Distance Learning.

Smith, S. (2019). Learner autonomy. EAPFoundation.com.

Tilfarlioglu, F. Y., & Ciftci, F. S. (2011). Supporting self-efficacy and learner autonomy about academic success in EFL classrooms (a case study). Theory & Practice in Language Studies, 1(10), 1284-1294.

Valencia, M. R. (2020). Modular approach in teaching science 10. International Journal of Trend in Scientific Research and Development.

Willison, J., Sabir, F., & Thomas, J. (2016). Shifting dimensions of autonomy in students' research and employment. Higher Education Research & Development.

Affiliations and Corresponding Information

Daphne Irish L. Gamorot
St. Peter's College – Philippines

Teresita B. Sambo, PhD
St. Peter's College – Philippines