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The Effects of Online Learning in the Intrinsic Motivation of Students in Learning Mathematics

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Abstract

Intrinsic motivation was defined as one of the best types of motivation. Some research shows that students who have high intrinsic motivation for learning tend to explore new learning and achieve higher than other students because they are not expecting tangible rewards, but they find such tasks interesting and fulfilling (Deci and Ryan). This study aimed to determine how distance learning during the new normal affects the intrinsic motivation of elementary students towards Mathematics. Quantitative methods through the administration of survey among Grade 3-6 elementary students at Chiang Kai Shek College was conducted. Results showed that most of the respondents were aged 11 years old, 51.6% are female, 56.1% like Mathematics. Additionally, the study revealed that elementary students are intrinsically motivated to acquire mathematics through distant learning through attention with highest mean and standard deviation (3.25, 0.48), grit/persistence (3.24, 0.50), learning environment (3.19, 0.57), and anxiety with mean and standard deviation (3.19, 0.57). However, students were found to encounter challenges during the online classes, such as poor internet connection, environment distractions, etc. Thus, the researcher suggests that by applying the EIM Guide Plan, the intrinsic motivation of the elementary students in learning Mathematics can be enhanced through distance learning.

Keywords: *Distance Learning, Intrinsic Motivation, Online Learning, Mathematics, Motivation in Learning Math*

Introduction

Mathematics is one of the most important pillars of any curriculum. Without attending to school, it is normal for a human to acquire mathematical ability. Everyone can learn the fundamentals of mathematics. Man's tools for coping with daily life include mathematical abilities such as arithmetic, problem solving, and data analysis. Motivation may be explained through personal or internal elements such as a student's interest, enjoyment, needs, or curiosity, or by external variables such as social pressure, incentives, and punishment. This means that motivation may be classified based on whether it is an external or internal element (Hoy and Hoy, 2003; Maggie, 2012).

Similarly, the pandemic hits many countries and encourages people to be always prepared (Aliyyah *et al*., 2020). To continue providing excellent education to students, schools in the nation have been compelled to turn to distant learning. Some institutions, however, were forced to close because to their inability to provide online instruction during the epidemic. Some pupils struggled with online learning due to unpredictable internet connections. With this abrupt shift in environmental learning, some ask if the adoption of distant learning will become part of the "new normal education" or if it will last for many years. This shift in learning mode may have an impact on students' learning and drive to study (Theressa, n.d).

Distance education, online learning, and e-learning are various synonyms for the same sort of education in which students and teachers never really meet (Simonson *et al*., 2011). Teachers and students utilize a variety of online tools to facilitate education and communication, including Zoom, Google Meet, and Microsoft Teams. Distant education is a widespread phenomenon of remote learn-

ing (students' task) and distance teaching (teachers' work). Teachers and students work together to guide and enhance their learning. Teachers provide feedback to students to help them improve their performance throughout the learning process.

Distance learning has been a difficulty for Mathematics teachers and students owing to online platforms that have become the essence of teachers' communication to offer Mathematics teaching to students. Students initially struggled to learn Mathematics intrinsically since they were taught mostly through face-to-face interaction and were accustomed to communicating with one another in the classroom (Beth, 2020). Some individuals are sceptical that distant learning can provide learners with the same critical thinking and problem-solving abilities as traditional classroom settings (Kaino, 2012).

On the other hand, motivating learning theory is a crucial idea in most learning theories. Behavioral theories, according to Weiner (1990), are more concerned with extrinsic motivation, where concrete benefits are expected, whereas cognitive theories are more concerned with intrinsic motivation, where an underlying drive to learn may be observed.

Motivation is directly connected to attention, anxiety, and grit. One example of motivation over grit is when a learner shows tenacity and determination in achieving an educational objective despite failures and hurdles. Stress can be reduced during instruction to increase motivation over anxiety. While motivation over attention demonstrates that if attention is reduced, the learner may fail to understand the material being taught during an instruction, a learner's physical learning environment may alter his attention during an instruction.

The conceptual framework for this study is depicted in the accompanying image below (*Figure 1*). It assumes that online education will boost pupils' intrinsic interest in math. The respondents were classified based on their age, gender, and fields of study.

The framework below demonstrates that the impacts of distant learning on primary students' intrinsic motivation toward mathematics are influenced by certain characteristics such as attention, anxiety, grit or persistence, and learning environment.

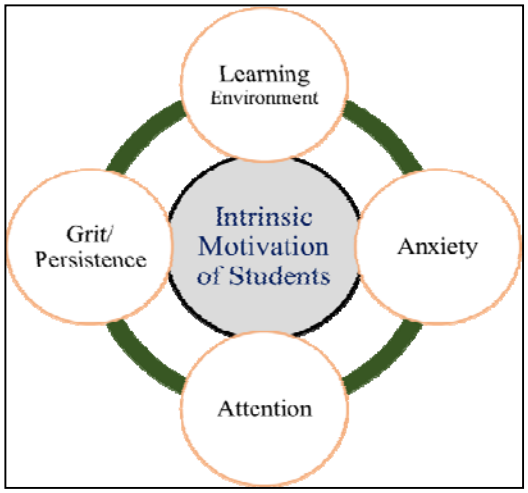

Figure 1. Conceptual Framework

The worries of students while studying mathematics through distance learning may affect their intrinsic motivation. Anxiety may impact a student’s intrinsic motivation to learn mathematics if they feel more stressed while learning. Students with anxiety tend to think less efficiently, which

may reduce their intrinsic motivation. Anxiety can be one of the inhibiting factors in learning. Therefore, anxiety needs to receive considerable attention. The intrinsic motivation of students to learn mathematics may be reduced if there is a presence of anxiety. Anxiety about learning can be caused by things like the learning environment, tests, making decisions or judgments, and reciting in school (Mandler, 2009).

Anxiety has shown poor performance in cognitive functions such as attention, concept formation, problem solving, and memory (Spielberg, 2013). Attention over motivation refers to how the attention of students while learning mathematics through distance learning affects their intrinsic motivation. Attention is the gateway to learning. If a student does not pay attention to the lesson, he may have difficulty understanding, learning, and remembering the lesson itself (Thorne and Thomas, n.d).

Attention is much more than just noticing an incoming stimulus. Attention is one of the first steps in the learning process. What one does not pay attention to cannot be comprehended, learned, understood, or remembered. It is said that attention and motivation are related to each other. If the student is not motivated, therefore, he/she will not pay attention to the lesson (Ratey and Galaburda, 2022).

On the other hand, "distance education," which is a method of conducting classes without the presence of a physical appearance, may be conducted through an online platform with the aid of the internet. Distance learning does not include physical interaction with a student's classmates. They study in the comfort of their homes, and their learning is more individualized. Distance learning relies solely on educational tools that are used by teachers. Distance learning can also connect students to various universities worldwide, making it easier for them to collaborate and learn together. It is more affordable than attending international schools. This is one of the reasons why it is the preferred choice of students because it is more accessible to students around the world with different socio-economic levels (U.E, n.d).

A survey conducted by one of the schools in Europe (2021) shows that as the pandemic led to the closures of academic institutions across the country, some countries have already started to take precautionary measures to move physical classes to online and distance learning, not only in secondary and primary schools but also tertiary and graduate schools. However, although distance learning offers great advantages not only to teachers but also to students, such as flexibility, continuity of learning, and mutual support from both parties, teachers and students still need to greatly adjust their learning and teaching to an online platform within a short period of time. Aside from that, it's hard for teachers to keep track of and make sure that their students are learning.

Lack of time in preparing math lessons is a challenge teachers face. Regardless of the method the teacher uses, it seems possible that students may not participate for a while (Cindy, 2020). Meanwhile, Beth (2020) stated that one passionate educator described teaching math using distance learning at the age of the coronavirus as "*tricky and complicated*." She even asked, "*How can we teach mathematics to students when we can't be by their side to facilitate their reasoning*?"

Motivation refers to how the persistence of a student learning mathematics through distance learning affects the student's intrinsic motivation. Persistence that can be seen in a student may show a willingness to continue learning despite the challenges and setbacks that she/he will be facing. It acts as a driving force to help students learn more. Grit and perseverance are two of the characteristics of an individual who shows perseverance to finish educational goals while facing setbacks and challenges. Grit is related to the concept of persistence or perseverance. Grit requires a person to work hard, to make an effort, and to want to succeed despite failures (Duckworth *et al*., 2007).

Persistence continues in the direction of a person despite setbacks, obstacles, discouragements, and difficulties. Sellgman (2006) says that a person who works hard to finish a task has a lot of motivation that comes from within.

Intrinsic motivation is how an individual inherits satisfaction while doing an activity without asking for some tangible reward. An individual who possesses this kind of motivation can perform a task for fun and be challenged without pressure or rewards (Neurorobot, 2009). On the other hand, the learning environment greatly affects students' intrinsic motivation to learn, as it offers students the chance to learn at their peak if they have a conducive learning environment set up. A learning environment is a place where learning takes place. A learning environment also sets the ambience for conducive learning. In addition, a good learning environment is one that makes students feel secure. Students need to feel emotionally, physically, and psychologically well before they can excel in school. Most schools see the physical classroom as a safe place to study, but not all physically safe learning environments also ensure their students' mental and social health (Raccon, 2018).

While learning, students' motivation is built upon. It is an efficient and effective way to enhance their learning (Kim and Frick, 2011). A student who has the desire to learn and takes part in an activity has been revealed to have motivation from within (Simes-Franklin *et al.*, 2010). The learning that takes place here is carried out in a traditional classroom environment. Teachers show students how to do things and help and direct them as they learn (Caroline, 2020).

Many educational institutions have abandoned the lecture hall in favor of online learning. Both the conventional face-to-face classroom and remote learning need a lot of effort and collaboration from the instructor and the pupils. Both teachers and students may provide and receive comments on both platforms. Additionally, homework may be submitted and completed online. Each learning setting has its own unique set of obstacles and benefits. Students need to be able to effectively manage their time for both. There are differences between face-to-face learning and distance learning, such as the fact that face-to-face learning typically takes place in a classroom setting that encourages student interaction and that distance learning typically takes place through digital mediums like Google Meet, Zoom, etc. Since there are no in-person interactions that favor more engaged students, online learning levels the playing field for all participants. Distance learning has the potential disadvantage of providing less immediate feedback to the learner than in more conventional classroom settings. Distance students also need to be more self-motivated and disciplined to succeed (Morgan, 2016).

In light of this, the researcher aimed to investigate how distance learning affects the learning of elementary students in relation to mathematics. This study provides a lot of benefits to the following: *school administrations, teachers, and students*. This study will also shed light on how distant learning can increase students' motivation to learn mathematics.

Rationale of the Study

Learning mathematics can be best achieved if students have an innate motivation to learn it without expecting any tangible rewards. Most of the time, students' motivation to learn mathematics can be reflected in the vast amount of their learning and can be developed depending on the type of learning environment during instruction. One of the outcomes of students' motivation is in the realm of mathematics, which treats and enhances students' understanding of mathematics (Hannula, 2006). Distance learning gives teachers and students a new learning environment where teachers teach using an online platform.

This kind of learning environment gives students a sudden adjustment period to learn outside the classroom. Several challenges include not having physical interaction with anyone, not being

able to participate in fun-filled school activities on the campus, and not being able to enjoy the physical classroom environment.

To highlight the effects of online learning on the intrinsic motivation of students learning mathematics, the following objectives were used:

1. To identify the demographic profile of students based on their age, gender, and academic interests.
2. To know the level of intrinsic motivation of elementary students in learning math in terms of the following:
   - 2.1 Attention;
   - 2.2 Anxiety;
   - 2.3 Grit/Persistence; and
   - 2.4 Learning Environment
3. To understand how distance learning affects the intrinsic motivation of elementary students towards mathematics, and;
4. To develop a guide plan for fostering the development of intrinsic motivation in students.

Materials and Methods

Research Approach. A quantitative and qualitative approach was used in conducting this study. Students' intrinsic motivation in Math was evaluated by survey questionnaires administered during online instruction. In order to gauge how students' intrinsic motivation changed throughout distant learning, the researcher conducted descriptive structured interviews with them. Elementary school teachers participated in structured interviews that supplemented survey results. Using mixed research design can improve the result of the data by ensuring that the result of the other research design (quantitative research design) is balanced by the other (qualitative research design). The purpose of combining the two-research designs was to enrich, examine, and explain the result gathered from the quantitative research design and from the qualitative research design. It also helped the researcher do triangulation, verifying and rejecting results obtained and vice versa (Greene, 2007).

Research Respondents. The study's respondents were elementary students at a selected school in Manila. The study included at least 100 students from each grade, ranging from third to sixth. The respondents were described according to their demographic profile such as their age, gender (male or female), and academic interest (Math, English, or Science). This study involved Elementary Mathematics teachers to be interviewed to provide support on the result of the survey questionnaires given to the elementary students. The elementary Math Teachers came from the same school.

Sampling. Research participants were selected using a simple random sampling process. Each possible population has the same chance of being sampled using this method. Thomas (2020) explains that researchers utilize the basic random sampling methodology to choose responses from populations in which every individual has an equal chance of being chosen. Since it just requires one random pick and as little as possible in the way of background information about the target population, simple random sampling is the simplest kind of probability sampling. With the use of simple random selection, the researcher was able to pick samples from which each individual had an equal chance of being selected as respondents.

Instruments. The researcher employed a self-made questionnaire to collect the necessary data for the respondents' demographic profile, providing and obtaining important data required for this investigation. Respondents' ages, sexes, and areas of study were all included in the demographic

profile. Structured interviews and surveys questionnaires were used to measure the effects distance learning on the intrinsic motivation of students towards Math. The structured interview questionnaire supports the data gathered from the survey questionnaires. The structured interview was given to elementary Math Teachers to provide support on the result of the survey questionnaires given to the elementary students. The draft of the structured interview and survey questionnaires were made based on the researcher's analysis of previous studies and related literature related to the study. The survey questionnaires were used as the main source to gather data related to the study, so the researcher made sure that the prerequisite knowledge in doing a good instrument for data collection was used. The instrument also used an open-ended structured interview questionnaire to give support and accommodate the views of the respondents related to the study. The instruments designed for this study were put through a validation process using face and content validity.

Fiona (2019) defined that validity needs to consider the idea that the questionnaire should first test what it is intended to test. The content of the questionnaires must be comprehensive of all essential aspects of the research to ensure content validity. The researcher sent duplicates of the survey and interview guides to a small group of specialists for review and feedback as part of the study's validation phase. In order to determine the instrument's applicability and fairness, these professionals closely assess how the research questions connect to the structured interview and survey questionnaires. In addition, modifications and changes were made based on other useful ideas and observations provided by the professionals who analyze the researcher's instrument.

Data Analysis. Findings from the study *"The Effects of Distance Learning on Elementary Students' Intrinsic Motivation Toward Mathematics"* were presented, analyzed, and interpreted. Statistical Package for the Social Science (SPSS) was used to analyze the data, and the results, as evaluated by the researcher, were reported in tables and text.

Results and Discussions

Table 1. Respondents by Age

Age	Frequency	Percent
8 years old	44	8.3
9 years old	111	21.1
10 years old	115	21.8
11 years old	147	27.9
12 years old and up	110	20.9
Total	**527**	**100.0**

Table 1 shows that 147 out of the 527 or 27.9% of the respondents are 11 years old, 115 out of the 527 or 21.8% of the respondents are 10 years old, 111 out of the 527 or 21.1% of the respondents are 9 years old, 110 out of the 527 or 20.9% of the respondents are 12 years old and up and 44 out of the 527 or 8.3% of the respondents are 8 years old.

Table 2. Respondents by Gender

Gender	Frequency	Percent
Male	255	48.4
Female	272	51.6
Total	**527**	**100.0**

Table 2 reveals that 272 out of the 527 or 51.6% of the respondents are female, and 255 out of the 527 or 48.4% of the respondents are male.

Table 3. Respondents by Academic Interest

Academic Interest	**Frequency**	**Percent**
Yes	287	54.5
No	26	4.9
Neutral	214	40.6
Total	**527**	**100.0**

As shown in Table 3, 287 out of the 527 or 54.5% of the respondents like Mathematics, while 214 out of the 527 or 40.6% of the respondents are neutral, and 26 out of the 527 or 4.9% of the respondents do not like Mathematics.

Table 4. Descriptive Analysis of Level of Intrinsic Motivation in learning Math elementary students have

Indicators	**Mean**	**Standard Deviation**	**Min**	**Max**	**Remarks**
Attention	3.25	0.48	1.00	4.00	*Agree*
Anxiety	3.04	0.55	1.00	4.00	*Agree*
Grit/Persistence	3.24	0.50	1.00	4.00	*Agree*
Learning Environment	3.19	0.57	1.00	4.00	*Agree*
Overall	**3.18**	**0.45**	**1.00**	**4.00**	***Agree***

Level of Intrinsic Motivation in Learning Mathematics of Elementary Students. Table 4 shows elementary students' level of intrinsic motivation in learning Math: attention with highest mean and standard deviation (3.25, 0.48), grit/persistence (3.24, 0.50), learning environment (3.19, 0.57), and anxiety with mean and standard deviation (3.19, 0.57); all have a mean interpretation of agree. The overall mean and standard deviation (3.18, 0.45) has a mean interpretation of agree. Distance learners are more intrinsically driven than on-campus (face-to-face) students, according to the results of a comparison research that was used to conduct and assess the intrinsic motivation of distance learners and on-campus (face-to-face) students (Weighting *et al*., 2011). However, other researchers have claimed that distance students need to be more intrinsically driven than their in-class counterparts since intrinsic motivation is tied to factors such as self-regulation to engage students and curiosity, which are influenced by the classroom setting. Some scholars think that technology may boost student motivation because it enables distant students to work together, participate in meaningful activities, and communicate with one another using all the tools at their disposal (Martens, 2005).

Distance Learning affects the Intrinsic Motivation of Elementary Students towards Mathematics. Using distance learning as a mode of teaching is a practical strategy to teach many students (Pityana, 2011). Distance learning has been seen as an effective educational instruction without sacrificing its quality. The term "*quality*" has been one of the topics in debate if distance learning were able to give adequate mathematical skills and knowledge to learners. But with the sudden changes of the mode of learning, schools are forced to shift to distance learning education because of the pandemic which results in some problems that both teachers and the students encounter.

One of the respondents said, "*One of the problems that I meet having online classes is the limitation of interaction between teacher and students, and among students themselves. This causes the students to lose their motivation to learn. They do not have or very minimal opportunity to interact with fellow their students*." Another teacher said, "*Since we are not in face-to-face classes, I somehow feel like some students are learning math because not that they want to, but just because they need to.*" Another respondent said, "*The students show lack of interest during the discussion which results to not paying attention nor actively not participating at all*.".

When it comes to the intrinsic motivation of the students in Mathematics over attention, elementary Mathematics teachers observed and said that "*Some students are doing other things such as browsing on the internet, playing with phones/toys near them, talking to someone at home and, watching TV instead of participating in the online class… Since the students are at their own pace and convenience, they do unnecessary things while the teacher is discussing, which might affect the students' drive for learning."* Another one said, "*They have very short attention span and less focus on the lesson*." A student who is intrinsically motivated in learning will most likely have the desire to learn, take part in an activity and will focus on his/her lessons without doing any unnecessary things (Garavan et. Al, 2010).

Elementary Mathematics teachers also observed that, "*Since having online classes everything is done virtually and there is less or no physical movement among students, most of them experience anxiety that really affects their learning*". "Another said that "*Some students feel bad if they get failing score in the test and they also feel pressure from their parents in achieving good grades.*" While another said that "*Some students might feel pressured specially if there is an adult watching them during online class*." Anxiety is one of the factors that can reduce the intrinsic motivation of a student in learning (Mandler, 2009). A student who has anxiety in learning may show poor performance in cognitive functions such as attention, concept formation, problem solving, and memory (Spielberger, n.d).

When it comes to the intrinsic motivation of the students over grit/persistence, two of the teachers observed and said that "*If the activity is by group like boy's vs girls' activity, you can see with the 2 parties that they want to win. But if it is individual activity other students just stay quiet."* And another one said that "*They are really persevering to do and accomplish their tasks*." Grit/Persistence is one of the contributing factors that affects the intrinsic motivation of a student. A student who shows perseverance to finish educational goals while facing setbacks and challenges, may show grit/perseverance and it increases the intrinsic motivation of the student (Duckworth, 2007). A person who shows great persistence to accomplish a task is said to be to have much intrinsic motivation from within. And lastly, according to the observation of the elementary Math teachers with regard to the intrinsic motivation of elementary students in Mathematics over their learning environment, they said, "*Learning environment gives a great attribute to the success of the learner*". It offers a positive ambiance to feel motivated and engaged. An ideal learning setting encourages the interaction with learners/instructors and eventually establishes a sense of support. During this time of pandemic, students have no choice but to have a school setting at home. their school set up affects their success to learn. Many factors can affect learning ability, including seating, light, noise, and even color which is sometimes not met in their environment at home. Students who study in a positive learning environment have been shown to be more motivated, engaged, and have a higher overall learning ability."

Another participant mentioned that "*Some students have their own rooms that is why they can focus with the class unlike those students studying in a common area of their home. They are distracted and somehow makes them feel shy if there is somebody watching them*." One teacher re-

marked that "*Some students were being distracted with the noise from their home and shy to turn on their camera due to the learning set-up they have at home.*" Raccon (2018) stated that a learning environment should offer learners safer surroundings. Before a student becomes successful academically, they should first feel stable emotionally, physically, and mentally. Most schools perceive classroom learning environment can give students a safe platform to learn, but not all good physical learning environment platforms consider the mental and emotional safety of students. Additionally, another contributing factor that affects the intrinsic motivation of students in learning is their *Learning Environment*. A conducive learning environment may increase students will in learning and can thus increase his/her intrinsic motivation.

The following statements above came from the observation and the difficulties that the Grades 3 to 6 Math teachers encounter with regard to the intrinsic motivation of students towards Mathematics during distance learning. Some students gave their own opinions regarding the difficulties that they have encountered during distance learning, and they are the following;

"*I have a hard time concentrating on my online if my surroundings are noisy*"

"*When in online classes in Math, when doing some activities, I always feel that I wouldn't get a good/high score."*

"*Poor internet connection, hassle in answering forms or worksheets, can't concentrate focus with background noise*"

"*I cannot concentrate when my dog barks loudly*."

"*Easily getting distracted*"

"*When internet is slow, I did not hear the complete explanation from teacher*."

"*The difficulties that I feel during online classes is that there happened a brown out or low internet connectivity because I might not hear about the lesson/s*."

"*The Difficulties that I feel during Online Class is when sometimes I don't understand the Topic and I can't talk because sometimes the teacher won't call me*."

"*I had hard time concentrating on my online if surroundings are noisy*.".

Both teachers and students encounter difficulties/problems while having a distance learning in Mathematics such as the problems with their surroundings, internet connection, power shortage, being easily distracted, having an anxiety about getting good grades, the absence of the physical interaction of the students and teachers during discussion, and the subject itself, because of the time allotted in each Math lessons that leads to some of the students who do not get sufficient time to comprehend what they are learning. These are examples of the difficulties that both the teacher and the students encounter during a distance learning education that may affect the intrinsic motivation of the students to learn Mathematics through distance learning education.

Distance learning is one of the disciplines that aims to focus more on technology, instructional design and pedagogy. It aims to deliver education to learners aside from traditional learning classroom. Distance learning is a process of creating and delivering quality educational experience to learners that best suit their educational needs outside the classroom (Salvador, 2011).

Some of the students were asked about their experience during online classes in Mathematics class, the following are their responses:

"*My experience is just fine.",*

"*It is my first time to experience online classes and I find it fun except I have problems with internet connection*.",

"*It was fine to learn Math in online class*.",

"*It is great if there are fun games.*",
"*I feel okay, but I would still prefer face-to-face class.*",
"*I am happy when we play a game.*",
"*It's enjoying and motivating me to learned about math because our teacher explained very well.*",
"*I enjoy online class but there is only a limited time for the lesson.*".

Although some of them encountered problems while having distance learning education in Mathematics, it did not affect their intrinsic motivation to learn Mathematics, instead students tried to find reasons to enjoy learning Mathematics and teachers tried to find ways to teach Mathematics so that students can enjoy learning the subject.

Proposed Guide Plan towards the Enhancement of Intrinsic Motivation. In the new normal mode of learning where distance learning is a trend, by following the "*EIM Guide Plan*", the intrinsic motivation of elementary students towards Mathematics can be enhanced during distance learning program.

Figure 2 shows the guide plan for enhancing the intrinsic motivation of the students in learning mathematics. The researcher provides six (6) necessary steps to be taken by doing so. These are as follows:

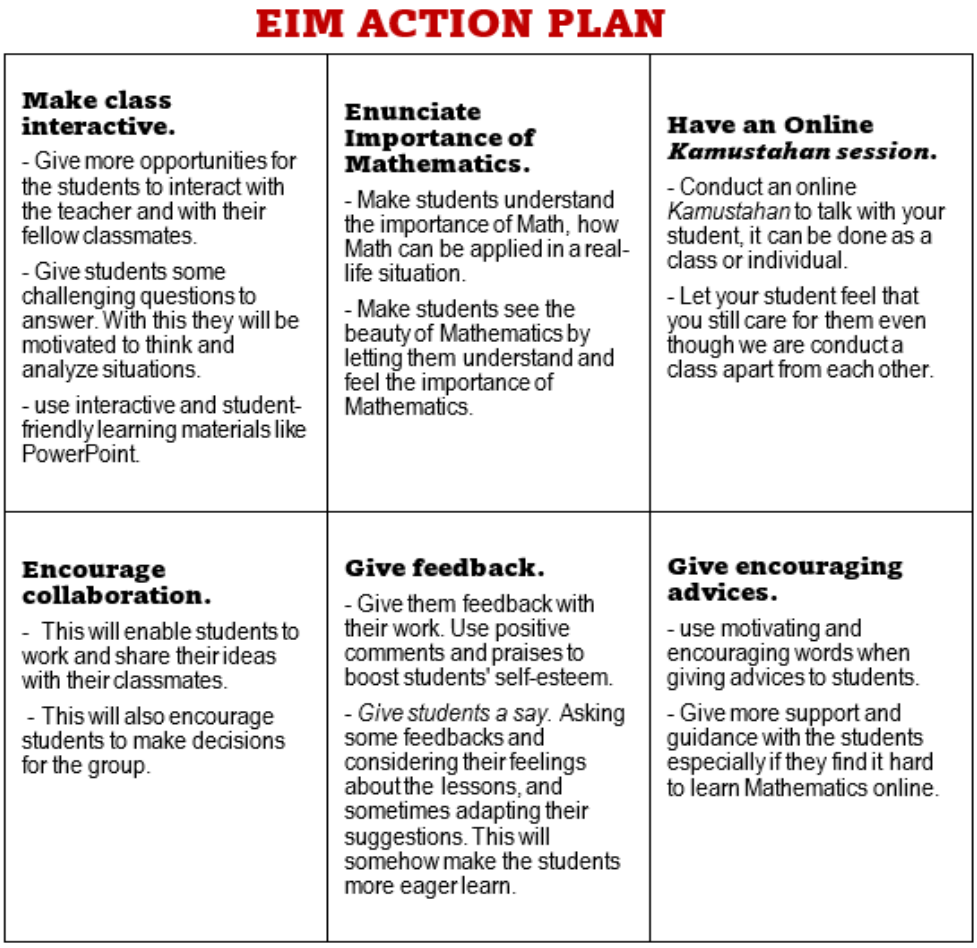

Figure 2. EIM Guide Plan

Make class interactive. Increase the number of chances for students to engage with the course material, the instructor, and their peers. Ask your kids some tough stuff and see what they can come up with. They will be encouraged to engage in critical thinking and introspection as a result. To further engage your students, consider using multimedia presentations like PowerPoint.

Enunciate the Importance of Mathematics. Make students understand the importance of Math, how Math can be applied in a real-life situation. Make students see the beauty of Mathematics by letting them understand and feel the importance of Mathematics.

Have an "Online Kamustahan" session. Conduct an *Online Kamustahan* to talk with students. Let students feel that their teachers still care for them even though they are apart from each other.

Encourage collaboration. This will enable students to work and share their ideas with their classmates. This will also encourage students to make decisions for the group.

Give feedback. Give them feedback with their work. Use positive comments and praises to boost students' self-esteem. Give students a say. Asking some feedbacks and considering their feelings about the lessons, and sometimes adapting their suggestions. This will somehow make the students more eager learn.

Give encouraging pieces of advice. Use motivating and encouraging words when giving pieces of advice to students. Give students more support and guidance especially if they find it hard to learn Mathematics online.

Conclusion

Based on the salient findings of the study, it can be concluded that online or distance learning education does not greatly affect the level of intrinsic motivation of elementary students to learn Mathematics. Although there are several problems that elementary students encountered while learning Mathematics through distance learning such as poor internet connection, learning environment distractions, etc., students instead find reasons to enjoy learning Mathematics and teachers find ways to teach mathematics so that students can enjoy learning the subject.

It can also be deduced that Mathematics teachers should help students enhance their intrinsic motivation to learn Mathematics through distance learning by making their lessons interactive, enunciating why learning Mathematics is important in their life, encouraging collaboration while using the online platform, and conducting an "*online kamustahan*" at least once a week to discuss problems that they are encountering while having online classes at the same to give feedback and pieces of advice to them that may encourage them to do their best. Finally, it can be concluded that internet and electricity providers should take into consideration that they should do their utmost to avoid outage as it hinders teachers and students' online classes.

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References

Adam, A. H. (2021). *Stratified random sampling*. Investopedia; Retrieve from https://www.investopedia.com/terms/stratified_random_sampling.asp

Aliyyah, R. R., Rachmadtullah, R., Samsudin, A., Syaodih, E., Nurtanto, M., & Tambunan, A. R. S. (2020). *The perceptions of primary school teachers of online learning during the COVID-19 pandemic period: A case study in Indonesia*. Online Submission, 7(2), 90-109.

Ames, C. (1992). *Classrooms: Goals, structures, and student motivation*. Journal of educational psychology, 84(3), 261.

Bandura, A., & Wessels, S. (1994). *Self-efficacy* (Vol. 4, pp. 71-81). na.

Bomia, L., Beluzo, L., Demeester, D., Elander, K., Johnson, M., & Sheldon, B. (1997). *The Impact of Teaching Strategies on Intrinsic Motivation.*

Caroline, C. (2020). *Online learning vs. traditional learning*. EasyLMS. Retrieve from https://www.easy-lms.com/knowledge-center/lms-knowledge-center/online-learning-vs-traditional-learning/item12530Communications of the Association for Information Systems, 19(12), (241).

Dana, C. (n.d.). *Persistence over motivation*. LAM. Retrieved from http://learningandtheadolescentmind.org/ideas_persistence.html

Deci, E. L., & Ryan, R. M. (2008). *Facilitating optimal motivation and psychological well-being across life's domains*. Canadian psychology/Psychologie canadienne, 49(1), 14. doi: 10.17705/1CAIS.01912

Duckworth, A. L., Peterson, C., Matthews, M. D., & Kelly, D. R. (2007*). Grit: perseverance and passion for long-term goals*. Journal of personality and social psychology, 92(6), 1087. Education Statistics.

Fiona, M. (2020). *The four types of validity*. Scribbr. Retrieved from https://www.scribbr.com/methodology/types-of-validity/

Intrinsically Motivated. (2016, September 11). Usable Knowledge.

Kaino, L. M. (2012). *Teaching Mathematics in Open Distance Learning (ODL): Does it make a Difference with Teaching in the Traditional Approach*? Huria: Journal of the Open University of Tanzania, 13(2), 346-357.

Kim, K. J., & Frick, T. W. (2011). *Changes in student motivation during online learning*. Journal of Educational Computing Research, 44(1), 1-23.

Klesius, J. et. al. (1997). *Distance education compared to traditional instruction: the students' view. history*. ERIC. Retrieve from https://eric.ed.gov/?q=Homan&pg=6&id=EJ570482

Li, C. and Lalani, F. (2020). *The COVID-19 pandemic has changed education forever. World Economic Forum*. Retrieve from https://www.weforum.org/agenda/2020/04/coronavirus-education-global-covid19-online-digital-learning/

McCotter, S. S. (2008). *What do they need? intrinsic motivation and online leadership learning.* Journal of Leadership Education, 7(1), (92-96). doi: 10.12806/V7/I1/RF5

Morgan, J. L. (2016). *Reshaping the Role of a Special Educator into a Collaborative Learning Specialist*. International Journal of Whole Schooling, 12(1), 40-60.

Morgan, K. (n.d). *Compare and contrast online vs. classroom instruction*. Seattle. Retrieved from http://education.seattlepi.com/compare-contrast-online-vs-classroom-instruction-1757.html

Movchan, S. (2018). *Face-to-face learning vs distance learning*. Raccoon Gang. Retrieved from https://www.cdl.org/what-is-attention/

Park, J., & Hee Jun, C. (2009). *Factors influencing adult learners' decision to drop out or persist in online learning.* Journal of Educational Technology & Society, 12(4), 207-217. Retrieved from Academic Search Premier database.

Pierre, O. and Frederic K. (2009). *What is intrinsic motivation*? Neurorobot. Retrieved from https://www.frontiersin.org/articles/10.3389/neuro.12.006.2007/full

Ratey, J. J., & Galaburda, A. M. (2002). *A user's guide to the brain: Perception, attention, and the four theaters of the brain*. Vintage.

Seligman, M. E. (2006). *Learned Optimism*. How to change your mind and your life.

Shroff, R.H. et. Al. (2007). *Student e-learning intrinsic motivation: A qualitative analysis*.

Simões-Franklin, C., Hester, R., Shpaner, M., Foxe, J. J., & Garavan, H. (2010). *Executive function and error detection: the effect of motivation on cingulate and ventral striatum activity*. Human brain mapping, 31(3), 458-469.

Simonson, M., Schlosser, C., & Orellana, A. (2011). Distance education research: A review of the literature. Journal of Computing in Higher Education, 23(2-3), 124–142. https://doi.org/10.1007/s12528-011-9045-8

Skinner, E. A., & Belmont, M. J. (1991). Motivation in the classroom: Reciprocal effects of teacher behavior and student engagement across the school year. Journal of educational psychology, 85(4), 571.

Spielberger, C. D. (Ed.). (2013). Anxiety and behavior. Academic press.

Thorne, G. and Thomas A. (2016) *Attention*. The Center for Literacy and Learning. U.S. department of education, national center for education statistics.

Weiner, B. (1990). History of motivational research in education. Journal of Educational Psychology, 82(4), 616–622. https://doi.org/10.1037/0022-0663.82.4.616