DIGITAL LEARNING MATERIALS AND MOTIVATION OF STUDENTS IN LEARNING GEOMETRY IN UAE

A.A.H. MOHAMED

Faculty of Science and Mathematics, Universiti Pendidikan Sultan Idris, Tanjong Malim Perak, Malaysia. Corresponding Author Email: memohelal77@yahoo.com

R.N. FARAH

Associate Professor, Faculty of Science and Mathematics, Universiti Pendidikan Sultan Idris, Tanjong Malim Perak, Malaysia. Email: rajafarah@fsmt.upsi.educ.my

ABSTRACT

This empirical study assessed the relationship between Digital learning materials and motivation of students in learning Geometry in UAE. The research scientific investigation utilised a quasi-experimental research design. A sample of 50 participants out of the 200 parent population was prudently selected employing the slovene's formula. The scholar used sampling strategies like simple random sampling and the lottery technique to garner facts for the research inquiry. Actualities were gathered utilising observation checklists, prior knowledge test, pre-test, post-test and motivation research survey tools which were supplied to the control and the treatment groups. Data were scrutinized using inferential statistics, independent t-tests, paired sample t-tests and confidence interval of the difference with a significance level below 0.05 .The examination study results came up with a significant association between Digital learning materials and motivation of students in learning Geometry in UAE.   It was thus concluded that the digital learning materials motivate students to learn and assist them in achieving the learning objectives in geometrical concept learning. The systematic research study recommended that ministry of education and all education bureaucrats should encourage instructors to involve technology in the teaching-learning processes to ensure that students improve in their learning regardless of the content in Geometry.

Keywords: Digital Learning Materials, Learners, Geometry, UAE

I. INTRODUCTION

Globally, human resources should be prepared to gain knowledge, technology, and skills through education. As a result, education in the 21st century plays a critical role in educating the next generation to compete in a globalized world. The function of education in the 21st century is becoming increasingly crucial in preparing the future generation to have certain abilities, such as learning and innovative skills, skills in using technology, media, and information, and skills in working and surviving (Mayasari, Kadarohman, & Rusdiana, 2021).

In the 21st century, education has been compelled to undergo considerable changes. One of the transformations is the shift from an industrial to a learning society (Malik, 2020). To deal with these developments, the concept of learning principles should be built to promote universal education. The modifications brought about by the reformation of the educational process. This reformation is viewed as an attempt to bring the situation and learning process in line with recognized standards (Häkkinen et al., 2017).

Using technology in education needs to develop digital learning materials or visual media. Visual media is mostly used to deliver a message or information, and it is made up of two-dimensional elements. Visual material, such as images in various publications such as newspapers, magazines, books, posters/signs on the streets, and graphics, are used on a daily basis and are experienced on numerous websites on the internet through the computer's screen. The rationale for this is that visual materials are more efficient and allow for picture representation, resulting in cognitive recognition processes that are identical to those we observe in the real world (Nicolaou et al., 2019).

The technology gives us the opportunity to learn using new learning style. Distance learning via the internet in all sectors of education, including mathematics, online distance learning has demonstrated amazing growth. More schools and universities are promoting their distance learning education programs and offering a diverse choice of specialties and degrees to appeal to a wider range of students. The number of institutions offering online or distant learning math classes increased by 14% between 1994 and 2001, according to the National Centre for Educational Statistics (NCES, 2003a). These programs served an estimated student population of 837,892 people. Students usually choose an online course because of the additional resources (including media), the self-directed learning style, the ability to receive quicker instructor feedback, and general pleasure with the learning experience (Chekour, 2017).

Motivation is willingness to do something, or something that causes such willingness (Cambridge Dictionary, 2021). Block et al. (2021) stated that extrinsic motivation could direct the start and bottleneck phases of learning. If it became independent, it would be pointless to have extrinsic rewards, so it switched to autonomous learning. Intrinsic as well as extrinsic encouragement can complement each other. On the other hand, learning often requires some driving force and extrinsic encouragement, as some rewards are usually learned for parent desires, added goals, and acquisition. Motivation for learning is a mediator between stimulus and response. If students are given realistic resources that enable them to be visually engaged and interact with what they teach in class, they will be more motivated to learn (Maulana, & Purnomo, 2021). In other words, learning motivation is the individual views of a learner on relations, and because of separate viewpoints, learners will present different needs for knowledge acquisition.

II. Research Objective

The specific objective of this logical study was to assess the effect of digital learning materials on students motivation in learning Geometry in UIAE.

III. RESEARCH METHODOLOGY

Data Capturing

Data were collected while using observation checklists, prior knowledge tests , pre-test, post-test and motivation research surveys which were valuable for the control and the treatment groups.   Auxiliary evidence was composed with the use of recognized

evaluations. The investigator came up with a total of 50 contributors (sample size) while using Slovenes technique to belong to the research investigation.

Sampling techniques

The research scholar utilised simple random sampling and the lottery technique to gather realities from the participants for the research planned study. The study's accessible population included the groups like learners, instructors, guardians and school Departmental heads

Research Instruments

In this research schoolwork several tools were employed, including: The Prior Knowledge Test, the Pre-Test, the Post- Test and the Motivation research Survey. The prior knowledge test was given priority and later the pre-test and post-test before and after the intervention was considered for the control and the treatment groups.

Motivation Survey Form

The motivation survey consists of 16 items to measure the effect of the new digital learning materials on the students' motivation during the learning process. The final survey form used a Likert scale of four points which is used to allow the students to express how much they agree or disagree with a particular statement. A Likert scale assumes that the strength/intensity of an attitude is linear from strongly agree to strongly disagree, and makes the assumption that attitudes can be measured. Each of the five responses has a numerical value which will be used to measure the attitude under investigation (Bertram, 2022).

Karim (2020) described learning motivation as an innate conviction that guides an individual's learning target, induces learning habits to make consistent attempts, reinforces cognition background, and strengthens and improves learning outcomes. The motivation survey in this research has been adapted from different researches that focused on the survey as a research instrument, a study on students' motivation in learning mathematics using multimedia courseware in 2010, Impact of using an educational robot-based learning system on students' motivation in elementary in 2014 and a survey of students' motivation for learning English in 1985. In this research students' motivation is one of the dependent variables. After using the digital learning materials as the intervention plan, the researcher will observe how the new digital learning materials motivates the students to learn, and a survey will be given to the students to measure the motivation .

Data analysis

Statistics in this inquiry were assembled in the form of grades from the pre-test and post-test. This examination was applied to check the significant difference between the treatment and control groups. All scrutiny was done using the leven's test for equality of variance, t-test for equality of means, and confidence interval of the difference with a

significance level below 0.05. Data was additionally analyzed by means of inferential measurements, independent t-tests, and paired sample t-tests in general.

IV. RESULTS

Relationship between Digital learning materials and students motivation in learning Geometry in UAE.

Table 1: Descriptive Statistics of the motivation survey

Survey points	N	Max.	Min.	Mean	Std. Deviation
The teacher is close to each student.	30	4	2	3.70	0.57
Make learning more interesting	30	4	3	3.87	0.41
It makes the student a self-learner.	30	4	1	3.57	0.68
It takes into account the needs of the student.	30	4	1	3.77	0.68
It makes the education process easy and convenient.	30	4	3	2.97	o.35
Achieving class goals.	30	4	3	3.63	0.47
It makes every student study the way that suits him.	30	4	1	1.33	0.63
It develops the thinking of the learner.	30	4	3	3.70	0.49
It makes class time long and boring.	30	2	1	1.70	0.48
It helps the learner to achieve his ambitions in life.	30	3	2	3.83	0.18
It doesn't help in focusing and waste the learner's time.	30	2	1	3.19	0.47
This type of education will spread in the future.	30	4	2	3.77	0.46
Its positives outweigh its negatives.	30	4	1	1.27	0.65
It makes mathematics concepts clearer and easier to understand.	30	4	2	3.57	0.50
It doesn't help weak students to understand and participate	30	2	1	3.53	0.45

The first statement contains a mean value of 3.70, which specifies that the majority of participants are in agreement that learning geometric ideas through the use of digital learning tools literally gets them enthusiastic. Although the opinions of the participants were virtually unanimously in agreement about the second statement, which essentially reflects that they were driven to study using the digital learning tools, which actually makes them enthused about learning mathematics, The particularly average for the third statement was 3.57, which suggests that the great majority of students are generally in agreement that the digital learning tools allowed them to become a self-learner.

Also, because participants' responses, on average, to the fourth statement—which states that the digital learning materials were addressing all of the students' needs

during the teaching process—averaged out to a score of 3.77, it concluded that they were in agreement with the premise. The students gave a response of 2.97 on average to the fifth item, which indicated that they agreed that the use of digital learning resources made the process of education simpler and more convenient. When questioned if the digital learning materials assisted them in achieving the aims of the class, the students unanimously agreed that this was the case, and their mean score of 3.63 strongly reflects that this is the case. Students were coming to terms with the fact that the digital learning tools allow each student to study in the manner in which he or she sees fit. A high average means of between 3.19 and 3.83 indicates that students strongly agreed with more points of the survey. These points include the following: the digital materials developed their thinking; it helped them to achieve their ambitions in life; students agreed that this type of learning is useful and helpful to them; it kept them focused in learning; and students agreed that this type of learning will become more widespread in the future.

Correlation between the motivations towards the digital learning materials and students' performance in post-test

The indicated association between the motivations towards the usage of digital learning materials and students' performance in post-test is strengthened by the fact that students' scores improved on the post-test as a result of successfully completing the Geometry problems and the motivations. The fifth null hypothesis states that there is no statistically significant correlation between the use of digital learning materials as a motivational education tool for students in learning geometry and the mean scores of students in the post-test. The process of calculating the correlation coefficient was the statistical method that was used to validate that.

Table 2: The correlation between the post-test measures of achievement and the measurements of motivation

		Achievement post-test	Motivation
Achievement post-test	Pearson Correlation	1	.832**
	Sig. (2-tailed)		.001
	N	30	30

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

According to the findings shown in Table 2, there is a strong positive significantly correlation between the students' scores on the achievement post-test and their scores on the self-reported motivations towards the digital learning materials after the treatment (r = 0.832, p = 0.001) The stated null hypothesis on digital learning materials as a motivational education tool for students in learning geometry is rejected.

The results of all of the research indicate that the pre-test score for both the control group and the treatment group is 1.33. Both the control group and the treatment group have demonstrated an upward trend in their mean scores between the pre-test and the post-test. However, after using the digital learning materials, the students in the

treatment group demonstrated more signs of improvement and achievement as compared to the students in the control group.

The results of the pre-test and post-test analysis showed that the students in the treatment group had improved in all three levels of the test: knowledge, problem-solving, and reasoning. This progress was demonstrated by the students in the treatment group. In comparison to the students who were assigned to the control group, the number of students who were unable to answer all of the questions was significantly lower in the control group. However, it was clear that the use of the digital learning materials that were developed by the researcher and the sequence of using it as animated videos, interactive videos, educational games, and at last the interactive worksheet can improve the students' ability to solve problems involving the concepts of geometry.

Table 3: Result of the hypothesis testing Analysis

Hypothesis	Result
Ho: There is no statistically significant correlation between the use of digital learning materials as a motivational education tool for students in learning geometry and the mean scores of students in the post-test.	Rejected

VI. CONCLUSIONS

This research has verified, by going through the students' pre-test as well as their post-test, that the digital learning materials motivate students to learn and assist them in achieving the learning objectives in geometrical concept learning.

Students have reported increased engagement in the learning process as a result of their use of these digital learning materials. Because animated videos, interactive practices, and educational games can boost students' motivation to learn Geometry, there should be more opportunities for students to use these materials.

The achievement of students and students' motivation toward learning should be the first priority for the Ministry of Education, school administrators, and teachers. Additionally, they should involve technology in the learning process to ensure that students improve in their learning regardless of the content in Geometry.

VII. Acknowledgement

Conflict of Interest:

There was no relevant conflict of interest regarding this paper.

References

I.   Bertman, S., (2022). E-learning, M-learning and D-learning: Conceptual definition and comparative analysis. E-Learning and Digital Media, 15(4) , 191–216.

II.   Blockl, P. H.et al (2021). Cognitive constructivist theory of multimedia: designing teacher-made interactive digital. Creative Education, 4(09), 614.

III.   Chekour, A. (2017). The effectiveness of computer-assisted math instruction in developmental classes. AURCO Journal, 23(Spring), 21-30.

IV.   Hakkkinen, M. et al (2021). Digital geoshapes learning media in supporting mathematics education II PGSD. Journal of Physics.

V.   Karim,, G. (2020). A Meta-Analysis of the Relationship between E-Learning and Students' Academic Achievement in Higher Education. Journal of Education and Practice, 6 (9), 6-9.

VI.   Malik, R.. (2020). A Cognitive Theory of Multimedia Learning: Implications for Design Principles. 91.

VII.   Maulana,Y.et Purnomo, H. (2021). E-Learning, Adaptive Learning and Mobile Learning. Switzerland: Springer Nature.

VIII. Mayasari,A., Kadorohman,I., & Rusdiana,P. (2021). E-Learning in the Teaching of Mathematics: An Educational Experience in Adult High School. Mathematics,8, 1-16.