

Effectiveness of Game Based Learning on Academic Achievement of Middle School

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Abstract

Education is the process of acquiring knowledge, skills, values, and attitudes through various methods such as teaching, training, or research. It is a lifelong process that involves the formal and informal transfer of information from one generation to another. Education equips individuals with the tools they need to understand the world around them, make informed decisions, and contribute effectively to society. The act of learning or teaching, or the process of acquiring or disseminating knowledge, known as education. It also involves preparing kids for adulthood. In contrast to many informal and non-formal forms of socialization, the discipline of education is concerned with how to teach and learn in classrooms or environments that are similar to classrooms. Critical abilities including decision making, mental agility, problem-solving, and logical thinking are developed in youngsters through education. Individuals experience difficulties in both their personal and professional lives. Their level of education and self-awareness determines their capacity to make logical and informed decisions in such circumstances. All school disciplines, including mathematics, are now taught and learned through game-based learning, which is a common practice in contemporary education. Several researches have examined how this teaching approach affects students' academic performance.

Introduction

Education is the process of acquiring knowledge, skills, values, and attitudes through various methods such as teaching, training, or research. It is a lifelong process that involves the formal and informal transfer of information from one generation to another. Education equips individuals with the tools they need to understand the world around them, make informed decisions, and contribute effectively to society. The act of learning or teaching, or the process of acquiring or disseminating knowledge, known as education. It also involves preparing kids for adulthood. In contrast to many informal and non-formal forms of socialization, the discipline of education is concerned with how to teach and learn in classrooms or environments that are similar to classrooms. Critical abilities including decision making, mental agility, problem-solving, and logical thinking are developed in youngsters through education. Individuals experience difficulties in both their personal and professional lives. Their level of education and self-awareness determines their capacity to make logical and informed decisions in such circumstances. All school disciplines, including mathematics, are now taught and learned through game-based learning, which is a common practice in contemporary education. Several researches have examined how this teaching approach affects students' academic performance. According to contemporary teaching theories, education has a significant impact on students' development of their affective domain in relation to the

subject and its instruction. Most people know John Dewey for his contributions to so-called progressive education. Progressive education primarily emphasizes the

GAME BASED LEARNING

✓ While actively involved in a game, our brains experience the joy of struggling with, and coming to understand, new systems, concepts, and perspectives. The same principles apply to digital games (Jukes, 2017) Game-based learning encourages active learning and engagement by providing students with possibilities to place problem-solving within the context of play. (Ebner & Holzinger, 2007)

Children always like to play. If they are not stopped, they can play continuously for hours without stopping because the power and energy remains within them. If by giving this energy the right direction, and when they are taught certain concepts while playing the game, they will definitely and better learn those facts easily. Teachers have the chance to design distinctive learning experiences that build on students' extracurricular literacy, such as gaming literacy, as technology usage rises in classrooms and homes. To do this, educators must evaluate prior studies on the application and efficacy of game-based learning. Serious games rely on students' own motivations for competitiveness, interaction, and innovation to motivate them. According to Vygotsky (1978), children are inherently social beings who learn best through investigation, and interaction with other Teaching methods are how the teacher transfers knowledge to the student. It is used in a very broad meaning; on the one hand, it encompasses a wide range of systems and schemes, and on the other, it also includes a wide range of teaching methodologies. Methods are sometimes thought of as methods, however this is incorrect. Rather of being the complete approach, a tactic can be an element of it. There are various ways to apply the same trick. Different subjects are taught to the students at primary and middle level. Mathematics is also one of those subjects. It has been seen many times that a lot of fear sets in the minds of the students regarding the subject of Mathematics. This happens only because of not using the correct method and technique of mathematics subject and not presenting the subject in the right way by the teacher. And this fear remains in the minds of the students forever. And further forever the students stay away from interesting subject like maths. On the contrary, if the teacher presents the mathematics subject well, then the students can reach a good level in the mathematics subject by learning the concepts of mathematics better and shape your future. There are a lot of methods and techniques may be used to teach mathematics, some of them are analytics, synthesis, inductive- deductive method, project method, laboratory method etc. These methods bring and develop the interest in the students towards mathematics learning.

Related Studies

1. Bregg (2012) - The effectiveness of the therapies was assessed by the children's performance on written tests using a quasi-experimental approach with a pre-test, post-test and delayed post-test. Test results showed that children learned less when playing games than when engaging in non-game activities and that learning was not enhanced by teacher-led talks that took place during and after game play.
2. Hong (2014) According to the experimental findings, the game-based e-book learning paradigm successfully increased the students' mathematical self-efficacy and motivation. The ratings of the three groups' mathematical anxiety were similar, with no **discern bite** variances.
3. **Brezoy of by et all** (2019) Results indicated that the training had various benefits at different grade levels, with **grad five** students adaptive number knowledge showing the most improvement, according

to the result the NNG can adaptable tool to supplement their everyday classroom activities white also improving various types of arithmetic knowledge and skill various primary school grades.

4. Bhadawkar & Grupta (2021) - result revealed that there is significant difference found between pre-test, scores of experimental and control groups, significant difference in the pre-test and post-test scores of the experimental group in the achievement test of Mathematics.
5. Algain & Eshan (2019) This article provides a synopsis of the three components of the educational process. In addition, five categories are used to classify the causes of the low academic achievement in mathematics: student-related variables, teacher-related factors, curriculum-related factors, family-related factors. The study also listed the phases that studying mathematics goes through in school and self-stage.
6. Temple & Mohammad (2020) The goal of this study was to see if the frequency of mathematics instruction daily versus every other day had any effect on Nebraska state Accountability Mathematics assessment. In order to examine arithmetic achievement, the continuous improvement. Ex post achievement data were used to conduct a quantitative causal-comparative analysis. The investigation includes a comparison of the mean variations between seventh and right-grade scores.

Objectives

1. To study the effectiveness of game-based learning on academic achievement of students in mathematics.
2. To study the effectiveness of game learning on the basis of gender.

Hypothesis

1. There will be no significant effect of game-based learning on Academic achievement between control and experimental group.
2. There will be no significant effect of Game Based Learning on Academic achievement of girls belonging to experimental and control groups.
3. There will be no significant effect of game-based learning on Academic achievement of boys belonging to experimental methods and control groups.

Method

Experimental Method was employed and simple randomized matched group post-test design was used.

Sample

The sample was restricted to 80 students out of which 40 were girls and 40 were boys studying in 7th class of BSP school Sector-10. The purposive sampling technique was used for the sample selection.

Tool

The present study was to study the effectiveness of game-based learning on academic achievement of the student academic achievement in mathematics tools was

Statistical Technique

T`test was applied to find out the significant difference between the groups.

Results and Discussions

The objective of the study was to know the significant difference in the academic achievement between control group and experimental group. Data was analysed by employing t-test and results were inserted in table - 1.

A careful glance at the results inserted in the Table - 1 clearly reveal that t' value of the magnitude 3.64 is higher than Table value (2.64) which is significant at 0.01 confidence level. In the light of this the null hypothesis that “there exists no significant difference in academic achievement between controlled and experimental group” stands rejected which shows that there exists significant difference in academic achievement between control and experimental group.

The academic achievement of girls of experimental group and control group data was analysed by employing t'test and results shown in Table - 2 clearly show that t' value of the magnitude 0.48 which is less than table value (2.71) which is significant at 0.01 confidence level. Hence the hypothesis that “there exists no significant difference in academic achievement between controlled and experimental group” is accepted.

The academic achievement of boys of experimental group and control group data were analysed by employing t'test and results were inserted in Table 3. A careful glance at the results inserted in Table 3 clearly reveal that t' value of the magnitude 5.47 which is higher than Table value (2.71) which is significant at 0.01 confidence level. Hence the hypothesis that “There exist no significant difference in academic achievement between controlled and experimental group” stands rejected which shows that there exists significant difference in academic achievement of boys of experimental group and control group.

Table - 1 Mean score, SD and t' value of the Academic Achievement of students of experimental group and control group

Category	N	Mean	SD	SE	t' value	Remark
Experiment al Group	40	29.57	5.39	1.20	3.64	significant
Control Group	40	25.2	5.36			

Table – 2 Mean scores, SD and t' value of the Academic Achievement of girls of experimental and controlled group

Category	N	Mean	SD	SE	t' value	Remark
Experiment al Group	20	28.0	5.92	1.70	0.40	insignificant
Control Group	20	97.15	5.20			

Table - 3 Showing the mean scores, SD and t' value of the Academic achievement of boys of experimental and controlled groups.

Category	N	Mean	SD	SE	t' value	Remark
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	20	31.15	4.32			
Group	20	23.25	4.79	1.44	5.47	significant

Findings

1. There exists a significant difference in the academic achievement of the students when taught through game-based learning methods of teaching mathematics. The mean score of the experimental group was higher than the mean score of the control group.
2. There is no significant difference in the academic achievement of the girls of the experimental group and control group, it was found that the girls of both experimental and control group showed similar academic achievements on the basis of scores they obtained in the achievement test.
3. There exists a significant difference in the academic achievement of boys of the experimental group and control group. The mean score of boys in the experimental group was higher than that of the control group. This shows that academic achievement of boys of the experimental group is better than the boys of the control group.

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