INVESTIGATING THE EFFECT OF EDUTAINMENT MODULE ON HIGHER-ORDER THINKING SKILLS

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Abstract

The purpose of this study is to use a quasi-experimental design using pre and post-tests to examine the impact of the edutainment module on the Higher Order Thinking Skills of fifth-year students. The ADDIE model, which consists of steps like "analysis," "design," "development," "implementation," and "evaluation," served as guidance during the module's creation. During the evaluation phase, five science experts reviewed the module's content and usability to ensure its quality. There was a total of 66 participants in the trial, with 33 assigned to each of the treatment and control groups. The pretest and posttest were utilized as evaluative tools. There was an improvement in performance across the board, but the treatment group outdid the controls by a wide margin. In addition, there was a statistically significant difference in the post-treatment and post-control test scores for higher-level thinking skills, as demonstrated by the independent sample t-test results. The results of this investigation indicate that students in Year 5 can benefit from the Jom Bijak Sains Module in terms of their development of Higher Order Thinking Skills. Based on the results of the research, this module can be utilized by fifth-grade science teachers to improve their students' Higher Order Thinking Skills.

Keywords: *Edutainment, Higher Order Thinking, Module, quasi-experimental*

INTRODUCTION

To meet these difficulties and keep up with the pace of change, educational institutions will need to implement a deliberate scientific approach and devote significant human resources to improving the quality of education in a versatile and effective way. Edutainment, or the combination of education and entertainment, has quickly become one of the most popular teaching methods.

Okan (2003) defines edutainment as "a type of hybrid education that heavily relies on visual elements, storytelling, and game-like formats to facilitate learning." Nasr (2019) argues that edutainment is an approach fitting for today's fast-paced culture and accommodating to students' requirements since it helps students improve their cognitive and practical abilities, broaden their perspectives, and have fun while learning about science.

According to Okan (2003) and Aksakal (2010), edutainment's worth lies in its attempts to pique students' interest and keep them focused on lessons and materials. Kakal (2015), Kusmarni (2017), and Nasr (2019) all agree that edutainment combines teaching with fun and games to better cement knowledge. According to Ksakal (2015), this piques students' curiosity, which in turn facilitates their mastery of difficult material and makes the study of well-structured themes and data more interesting.

Given the importance of this method, researchers have implemented it in a wide range of courses and grade levels (Rahman et al., 2017; Abdualhamed et al., 2017; Abu Hilal, 2018; Nasr, 2019) to foster the growth of multiple dependent variables.

Abu Rajab (2012) argues that science is one of the most important subjects for enhancing students' ability to learn and retain new information, as well as developing their critical thinking, problem-solving, and interpersonal skills. There are many obstacles in the way science is taught, but one of the most significant is that many educators continue to rely on time-tested practices that don't meet the learning styles and preferences of today's students (Nasr, 2019).

The anxiety and fear of making a mistake that some students experience due to the difficulty of the material or their worry about making a mistake can be alleviated using edutainment, as stated by Jones (2011). Learning science, as argued by Bulunuz (2015), may be made more fun and rewarding by providing students with engaging assignments and activities. Teachers and students alike benefit from this because it fosters an environment that is conducive to learning and promotes a spirit of cooperation that encourages pupils to study science in a lighthearted manner.

In addition, evidence from international assessments like the Trends in International Mathematics and Science Study (TIMSS) and the Programme for International Student Assessment (PISA) shows that students are prepared to apply for Higher Order Thinking Skills (HOTS). Numerous studies (Fensham & Bellocchi, 2013; Gough, 2014; Haahr, 2005; Ritz & Fan, 2014; Siew, Amir, & Chong, 2015) show that many teachers believe today's students lack the ability to think critically and creatively when confronted with problems. Many educational theorists (Fensham & Bellocchi, 2013; Gough, 2014) agree that the current educational system needs a serious overhaul. Student stress and anxiety, as reported by Nixon and Rackebrandt (2016), are the results of a persistent failure to grasp scientific concepts (Kurniawan & Maryanti, 2018; Suma et al., 2019). This study's overarching objective is to develop an educational entertainment module for assessing the usefulness of abstract scientific ideas for pupils. This module was developed so that teachers could present the material without having to devote an inordinate amount of time to lesson preparation.

METHODOLOGY

The study's main objective is to investigate the effect of the edutainment module on HOTS. To achieve this goal, an experimental evaluation of the relevant module is performed. For group comparisons, experiments are the gold standard (Chua, 2006). Since the research sample is a screening of the current group (class), this study focuses on participants with moderate or poor Science achievement. The effectiveness of the revised module is evaluated through a pre-post test design (Nor Aizal Akmal, 2015; Azmiza Ahmad et al., 2014; Mohd Hasril Amiruddin, 2014; Saripah Salbiah Syed Abdul Azziz et al., 2013) and a post-test comparison between the treatment and control groups. Internal validity is excellent despite the design's apparent ease (Chua, 2006). Table 1.1 provides an overview of the methodology used in this investigation.

Table 1.1
Research Design

Sample	Group	Pre test	Treatment	Post test
Year 5	Treatment	Yes	Yes	Yes
Year 5	Control	Yes	No	Yes

The group in this study that makes use of the edutainment module might be considered the experimental group. In this research, the group that engages in the traditional method of education makes up the study's control group. The purpose of the control group was to achieve a mean score for traditional learning at school, while the purpose of the experimental group was to obtain a mean score for learning with the assistance of modules. In this research, the pre-test and post-test have been used as evaluation instruments. The purpose of this study was to investigate how students in Year 5 performed on a pre-and post-test that was administered after they had used the edutainment module. A needs analysis phase, a design phase, a development phase, an implementation phase, and an assessment phase were all components used to develop this module, just as they are in the ADDIE model.

In order to accomplish the objectives of the study, the following hypothesis was used.

$H_0$1 There is not a significant difference in the mean score of the student's higher-order thinking skills between the groups that were taught using traditional methods and those that were taught using post-test-based modules.

$H_0$2 There is not a significant difference in the students in the experimental group's mean score on the higher-order thinking skills pre-test compared to the score they received for the post-test.

This study was conducted in a primary school in Senawang district, Negeri Sembilan. Before the researcher continued with the intervention and data collection, the research proposal was submitted to the Education Planning and Research Department (EPRD), Ministry of Education Malaysia, and received approval. In this study, the researcher conducted fourteen teaching and learning sessions for each treatment and control group. These two groups were taught the same topics related to higher-order thinking skills using different methods. The control group was taught using traditional methods while the experimental group was taught using the JBS module. The research tools used are pre-tests and post-tests that aim to assess students' level of understanding of the topics taught.

FINDINGS

Before beginning to answer the issues and hypotheses raised by the research, it was first determined whether the two groups were comparable in terms of the higher-order thinking skills they possessed. This was accomplished by utilizing a t-test to compare the mean scores of the students in each of the two groups. According to the findings presented in Table 1.2, there were no variations in the means of higher-order thinking skills that could be considered statistically significant. This demonstrates that there is no difference between the two groups in terms of their ability to engage in higher-order thinking.

Table 1.2
HOTS of Students before treatment (Pre-test)

Group	N	Mean	df	t	p
Experimental	33	17.03	64	-1.580	.119
Control	33	20.18			

$H_0$1 There is not a significant difference in the mean score of the students' higher-order thinking skills between the groups that were taught using traditional methods and those that were taught using post-test-based modules.

In order to provide an answer to the subject at hand, what is the efficacy of utilizing an edutainment module in the development of higher-order thinking skills among science students? On the post-test designed to evaluate higher-order thinking abilities, the significance of any differences found between the mean scores achieved by students in the control group and those in the experimental group was examined. Table 1.3 was utilized to keep track of the outcomes.

Table 1.3
HOTS of Students after treatment (Post-test)

Group	N	Mean	df	t	p
Experimental	33	78	64	6.171	.000
Control	33	64.9			

To determine whether the experimental and control groups have significantly different levels of higher-order thinking skills, a t-test based on independent samples was carried out. There were significant mean differences, as shown by t = 6.171 with a significance level of p =.000 in Table 1.3. The mean score for higher-order thinking skills among participants in the experimental group was considerably higher than the mean score among participants in the control group, which was 64.9 and had a standard deviation of 9.194. As a result of this, the use of the model is beneficial in elevating the level of higher-order thinking skills possessed by the students who were a part of the experimental group.

Calculating Eta Square (2) allowed for the determination of the magnitude of the effect that applying the module has on the development of higher-order thinking skills. This allowed for the determination of the degree to which this strategy is effective. The effect size, measured as a squared value, was.161, suggesting a very significant effect. The findings provide credence to the notion that the two student groups had significantly different levels of higher-order thinking skills as measured by test scores.

$H_0$2 There is not a significant difference in the students in the experimental group's mean score on the higher-order thinking skills pre-test compared to the score they received for the post-test.

To determine whether or if the edutainment module can help students develop higher-level thinking, a paired-sample t-test was carried out. The participants in the study had their data taken both before and after they completed the JBS module. The findings showed that the mean score on the post-test was significantly higher than the mean score on the pre-test (M = 17.3, SD = 8.09), as evidenced by the statistic t (9) = 46.58, which was statistically significant (Table 1.4). The effect size, measured as a squared value, was.744, suggesting a very significant effect. The findings lend credence to the hypothesis that the JBS module was successful in fostering more advanced scientific thinking in the student body.

Table 1.4

HOTS of Students before (Pre-test) and after the edutainment module (Post-test)

Group	Mean	SD	t	p
HOTS				
Pre-test	17.3	8	46.58	.000
Pos-test	78	8.09		

DISCUSSION AND CONCLUSION

As was said earlier, one of the key motives was to increase awareness of HOTS by fostering the development of problem-solving skills through the medium of edutainment. This was one of the primary motivations behind the creation of the game. The post-test scores of the students in the treatment group were significantly higher than those of students in the control group; nevertheless, the results were otherwise ambiguous. Based on this discovery, it appeared as though the use of the HOTS-based module was not the primary factor in the improvement of problem-solving abilities. A few of the numerous factors that may have an impact on the outcomes include parental involvement, the academic chances offered by the institution attended, and individual initiative. There is no question that these topics require additional academic investigation. On the post-test measuring problem-solving abilities, the treatment and control groups did not have comparable levels of performance to one another. An educational game based on HOTS's framework may be used to teach students how to problem-solve, which would be a step in the right direction toward resolving the issue at hand. This conclusion is consistent with the findings of Syder (2000), who discovered that students in the treatment group did better than students in the control group when it came to their capacity to answer difficult tasks. In every HOTS-based session, the appropriate assignments are provided for the students to complete, which enables them to apply the knowledge they have gained to either fictional or real-world scenarios.

Studies related to educational entertainment in science subjects aim to combine elements of entertainment and teaching in the science learning process. It aims to make science learning more interesting, fun, and able to involve students actively. In the future, teachers can use interesting science experiments and interactive demonstrations to show students science concepts. This helps students see science in action and strengthens their understanding.

On the other hand, teachers can apply challenging and fun science concept games to help students understand science concepts in an interactive way. For example, science board games, science video games, or online games related to science topics. Teachers can also provide opportunities for students to implement creative projects related to science. Projects such as making science models, science research, or building simple science tools can help increase students' interest and understanding of science.

Future recommendations for research related to edutainment in elementary school science subjects may include the discovery and use of more interactive digital technologies, mobile applications, and online learning resources. Furthermore, emphasis can be placed on the multidisciplinary integration of science with elements of art, technology, engineering, and mathematics (STEM) to provide a holistic and comprehensive learning experience.

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