

Research Article

The Effectiveness of Virtual Learning to Enhance Higher Order Thinking Skills in Year 5 Students

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Abstract: Learning to increase Higher-Order Thinking Skills (HOTS) should be a central focus of education in the twenty-first century, with an emphasis on providing students with meaningful opportunities to engage in critical thinking, problem-solving, and creative problem-solving. Information on the issues and requirements of elementary science education was compiled based on preliminary investigations conducted over the past five years. Students' ability to learn science on their own and grow in their understanding is hindered due to a lack of resources that encourage the growth of higher-order thinking skills. In this research, we will investigate whether students' HOTS may be improved using virtual learning. In many respects, students, and communities alike benefit from virtual education. Developing e-module virtual learning to enhance primary school students' higher-order thinking skills is currently necessary to improve the grade of learning in accordance with instructors' credentials. This shift is founded on the idea that e-modules are complete, self-explanatory units that may be used for individual study.

Keywords: E-Module, Primary School Education, Virtual Learning, Higher-Order Thinking Skill.



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1. INTRODUCTION

In the face of the currents of globalization, education currently faces a formidable task. However, globalization necessitates that schools craft curricula that can meet the problems it presents. One of the challenges that globalization poses to the field of education is the rapid development of information technology. These innovations in information and communication technology (ICT) have an impact on many facets of modern life, including education. As a result, the field of education must immediately embrace these technological developments. There are both theoretical and applied components to a well-rounded science education. Therefore, this topic needs to be presented imaginatively in order to be studied effectively.

Science is crucial for molding future generations into smart, prosperous, and competent individuals. Therefore, learning science should be about more than just getting good grades; it should also involve enjoying and applying the concepts learned. Teachers need to be well-versed in a variety of teaching strategies and creative in order to pique their students' interest in and participation in those strategies.

2. THE IMPORTANCE OF SCIENCE EDUCATION

The scientific and technological forefront has always been associated with more advanced economies. They have been able to make strides because they regularly evaluate and comprehend changes in the science curriculum. Their goal is to improve the quality of education in STEM fields from kindergarten through college (Razali et al., 2020).

Previous studies have emphasized the value of science for employment, particularly its global significance (Gottfried et al., 2016), in bettering the nation's socioeconomic status (Paige, Zeegers, Llyod, & Roetman, 2016), in maintaining the reliability of technology systems (Onyekuru, 2015), and in enhancing the quality of science curriculum development (Fensham, 2016). However, various elements must be recognized to generate students that are literate in and curious about science in order to build a strong professional base. Learning criterion analysis should also be applied to the factors that influence students' interest in science.

3. ISSUES AND CHALLENGES IN SCIENCE EDUCATION

The newest technological developments have the potential to change the educational environment. Educators and students alike now have more access to high-quality, up-to-date resources and T&L because of the proliferation of digital media and the growth of the internet (Hazenah, 2014). Many students, however, are unable to acquire High-Level Cognitive Skills due to the outmoded teacher-teaching approach (Zainudin et al., 2015) and the fact-memorizing phenomenon (Mat & Yusoff, 2019). Therefore, students' proficiency in higher-level thinking skills remains poor.

Teaching materials are essential in this process because they encourage students to learn on their own and provide them with the information, they need to become proficient on their own (Darling-Hammond et al., 2019). Teachers need to develop lessons using materials from multiple sources if they want to give their pupils rich learning opportunities. Considering this situation, it's clear that there's a pressing need for a resource like this, a learning module that puts an emphasis on the use of higher-order thinking skills from an early age. This is because many first-year students lack proficiency in these types of higher-level cognitive processes. Teachers should employ effective lessons and strategies to help their pupils develop higher-order thinking skills.

4. TEACHING APPROACH

Students' achievement and enthusiasm in science are influenced by a wide range of circumstances. The number of students in a class, the teacher's effectiveness, the teacher's teaching skills, motivation, and the students' personalities all play a role in a student's learning experience (Abbasi et al., 2018; Ale, 1989; Armstrong, 2009; Bietenbeck, 2011; Ehrenberg, Brewer, Gamoran, & Willms, 2001; Harris & Sass, 2008; Kirillova et al., 2013). Therefore, the chosen method of instruction should consider the students' ages and cognitive development. Appropriate pedagogical strategies aid in student retention, information gain, skill development, and motivation (Mat & Yusoff, 2019).

However, enhancing students' HOST and learning skills is necessary to enhance science education in primary schools. Efforts to raise education standards in the diverse and demanding 21st century would be futile without a demand for them. There are three primary models to consider when developing skills for the 21st century: (Scott, 2017) These are the abilities to learn and innovate, to succeed in life and work, and to use information, media, and technology. Skills in communication,

group work, critical thinking, and creative problem solving (4CS) make up the learning and innovation abilities. Versatility, hard work and personality, social and cross-cultural ability, efficiency and effectiveness, leadership and responsibility, and accountability are the cornerstones of a well-rounded professional and life skill set. Finally, ICT competence includes the ability to gather and disseminate accurate information to a large audience.

As a result, a variety of teaching strategies are required to accommodate the wide range of student learning styles. Students strive to integrate what they've learned with what they already know. Students in the modern era, who are fluent in technology, have lost interest in more conventional forms of education because of the increasing complexities they bring to the classroom. Keeping students interested in their studies calls for innovative approaches (Zaidi et al., 2018). This includes implementing novel approaches to delivering instruction to pique students' interest, boost retention, and deepen understanding (Gulley & Jackson, 2016).

The usage of YouTube videos in the classroom has recently attracted the attention of researchers. Jackman and Roberts's (2014) study, for example, found that showing students relevant YouTube videos helped them better understand psychological topics. YouTube videos have been shown to be helpful to ESL students in Malaysia, according to research conducted by Zaidi et al. (2018). Another study by Green et al. (2018) described how the usage of training videos in American health management helped students improve their interpersonal and communicative abilities.

YouTube Kids was released as an app on February 15, 2015, by YouTube, a Google subsidiary (Burroughs, 2017). In example, the YouTube Kids app allows parents to keep tabs on the content their children are exposed to by keeping track of the channels they've subscribed to ('YouTube Kids App,' 2018). This program is extremely intuitive and can be obtained for free from the App Stores on iOS and Android devices ('YouTube Kids App', 2018). The app's target demographic necessitates a few barebones features, such as a selection of kid-friendly channels that can be specifically selected by their parents. Furthermore, children under the age of eight cannot establish their own accounts ('YouTube Kids App', 2018). Finally, the 'YouTube Kids App' (2018) allows parents to filter out or report questionable channels or videos. Therefore, the focus of this study will be on the pedagogical and instructional features that give online education an edge over more traditional approaches to education.

5. VIRTUAL LEARNING ENVIRONMENT

In traditional classrooms, where teachers impart information using chalk and markers, this method is effective (So, 2014). Students are only able to interact with the teacher in a unidirectional fashion, with the expectation that they will respond to questions or comments when requested (Shah & Patel, 2017). Students are often expected to copy notes directly from the whiteboard. The traditional chalk-and-talk method is becoming less effective in meeting the needs of modern pupils (Jabeen & Ghani, 2015). Students are more engaged when their education includes physical activity or fun activities. The reason for this is because comprehension is essential for learning.

Furthermore, Mata, Monteiro, & Peixoto (2012) argue that the strategy taken for teaching and learning is the most important component in shaping students' attitudes toward science. Traditional, teacher-centered methods of instruction are still used by certain educators. Learners could be discouraged by these strategies. Therefore, the government of Malaysia launched Frog VLE as a platform to increase students' knowledge and comprehension.

Virtual learning environments (VLEs) are online classrooms that simulate traditional classroom settings. Before the advent of modern technologies, classroom instruction, and student education followed a more rigid structure (Rheingold, 2004). Students can be inspired to pursue STEM subjects

in school using virtual reality technology, according to a recent study (Yang & Wang, 2012). For instance, Oliver and Trigwell (2005) found that students' interest in and motivation for developing their practical activities were both positively affected by the quality of the learning resources they had access to. Web-based learning activities, such as the on-screen display of an experiment, online quizzes, journals, video conferencing, and many others, can take many forms, depending on the instructors' imaginations. Supporting web-based learning tools, an interactive learning environment fosters cognitive talents including critical thinking and engaging learning.

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