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KidCadTech STEM Module Solution

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Abstract
This study aimed to study the effectiveness of this STEM module solution as a learning kit for Reka Bentuk Teknologi Subject and to suggest ways to improve on how to engage more while learning by involving students and teachers at school while using teaching aids, especially in STEM Subject. 40 secondary school teachers and 10 secondary school students participated in this study and were interviewed. STEM Module Solution is a Teaching Aid specifically for teachers and students who teach and learn RBT Technology Design subjects in secondary schools. This kit also has Augmented Reality as a medium to convey information more comprehensively and give maximum impact.

Keywords: STEM, Learning Kit, Augmented Reality

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1.0 Introduction

As a social institution servicing societal demands, education is essential for society's survival and growth. It must not only be comprehensive, long-term, and excellent, but it must also adapt over time to meet the difficulties of a rapidly changing and unpredictable globalized world. School teachers, college professors, administrators, researchers, and policymakers are expected to innovate the theory and practice of teaching and learning and all other parts of this complex organization to assure the quality preparation of all students for life and work.In this paper, we examine educational innovations, identify challenges to innovation, and sketch out prospective routes for practical innovations. We discuss the current state of innovation in Malaysian education, including what educational innovation is, how it is implemented in schools and colleges, why innovations do not always have the desired effect, and what should be done to increase the scale and rate of innovation-based transformations in our educational system. Following that, we make proposals for the expansion of educational innovations.

Innovation and evolution are essential for an individual, a nation, and humankind to survive and progress. Innovations in education are significant because education plays a crucial role in creating a sustainable future. "Innovation resembles mutation, the biological process that keeps species evolving so they can better compete for survival" (Hoffman and Holzhuter, 2012, p. 3). Innovation, therefore, is to be regarded as an instrument of necessary and positive change. Any human activity (e.g., industrial, business, or educational) needs constant

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innovation to remain sustainable.The need for educational innovations has become acute. "It is widely believed that countries' social and economic well-being will depend to an ever greater extent on the quality of their citizens' education: the emergence of the so-called 'knowledge society, the transformation of information and the media, and increasing specialization on the part of organizations all call for high skill profiles and levels of knowledge. Today's education systems are required to be both effective and efficient, or in other words, to reach the goals set for them while making the best use of available resources" (Cornali, 2012, p. 255).

To innovate, we must think beyond what we are doing now and develop a creative idea that will allow us to conduct our jobs differently. The goal of each invention is to develop something different from what we have been doing in terms of quality, quantity, or both. The researcher must put the innovation to work to have a significant, transformative impact, requiring rapid dissemination and large-scale application. As a result, innovation necessitates three primary steps: an idea, its implementation, and the outcome that arises from the concept's execution and results in a change. In education, innovation can take the form of a new educational theory, methodological approach, teaching technique, instructional tool, learning process, or institutional structure that, when implemented, results in a significant change in teaching and improved student learning. As a result, educational innovations aim to increase learning productivity and efficiency while improving learning quality.

The amount of time, money, and resources required to achieve specific goals measures efficiency. In education, learning efficiency is primarily determined by time and money spent. Learning is more efficient if we can attain the same achievements in less time and for less money. Estimating the outcomes obtained vs. the work expended to reach the result is calculated productivity. As a result, productivity rises when we can accomplish more with less effort. As a result, educational innovations should enhance both learning productivity and efficiency. Meanwhile, In Malaysia, Education has always been a contentious debate topic, regardless of the venue: a meeting at the Ministry of Education, a conference, a forum, a blog, a teacher-parent meeting at school, in the classroom, or around the dinner table. We all prefer to contribute our opinions on efficient schooling, whether we are specialists, have undergone basic professional training, or speak from our personal experience as past pupils.

Our educational systems have progressed from the classical Trivium via methods and approaches such as The Silent Way or the Total Physical Response to the full-scale deployment of ICTs, driven by the goal to find the perfect "recipe" for 100 percent successful learning. New classroom ideas, methods, and techniques are constantly being invented, argued, applied, and subsequently replaced with newer, more effective approaches, methods, and techniques. Is the ideal 'learning recipe' a pipe dream? Perhaps it is? But there is one thing we can all agree on growth is impossible without education. To learn more about the relevance of technology in education, go to Immerse education. In the development of education, the essential thing is to know what teacher will use materials and requirements in the learning environment in the classroom. To test the effectiveness of technology in education, we should do a study in the field to produce various teaching aids for learning and teaching use.

One of the teaching aids used is to apply innovation into education to make it a valuable resource for use in the classroom. The purpose of this study is to identify the appropriate teaching and learning kit to apply in education so that the effectiveness of the use of this material as a learning material can provide a positive and effective impact on users, especially on school students and teachers. This study also explores the relationship that innovation can bring to be absorbed in daily education in schools, especially in the classroom, to enhance student learning to create critical thinking and problem-solving.

2.0 Literature review

The learning kit is defined as a comprehensive teaching material for learning topics (Dewan Bahasa & Pustaka 2007, p.48). The kit is also for teaching an Teaching Aids example (ABM). Different teaching aids for a subject can be developed and prepared. Teaching and learning kits are called the instructional tools stored in a container (plastic, boxes, wood, etc) (Norzainariah Abu Hassan, 2004). This storage is designed to make management and storage easier. Learning kits usually have non-electronic visual equipment and material, such as alphabet cards, storyboards, photos, plastic blocks, storey cassettas (Norzainariah, 2004) and boxes, with tools used throughout the learning process and other activities (Prihatiningtyas et.al, 2012). The learning kit is intended to facilitate learning and understanding of the topic for students. The way the learning kit is used is a learning strategy to help improve student performance that can be implemented by teachers. The students' achievement through the use of learning kits will be more effective. This is because students are able to understand and master a concept and improve the test results in the classroom.

Fig. 1 : Technical Drawing

2.1 Functions & Element

The primary reason packaging is created is to store products in cost-effective ways, to meet industry needs and consumer desires, and to ensure the product's safety. There are numerous factors that can be related to effective packaging that aids in the product's existence to the consumer. Packaging serves the following purposes:

- To protect
- Marketing and information
- Convenience
- Transportation

Packaging allows the product's quality to be preserved while also keeping the product safe. In other words, packaging will protect against three major external factors: chemical, biological, and even physical. Chemical protection can help to minimise changes in product composition caused by environmental influences such as exposure to damp and light. There are numerous materials that can act as a barrier to chemical influence. Biological protection, on the other hand, can act as a barrier to microorganisms, insects, rats, and other animals that can cause dangerous disease. Physical protection can prevent mechanical damage to the product and reduce physical impact during the delivery process.

Packaging is the product's face and the only medium through which the product is exposed to the consumer. In general, appealing and innovative packaging can boost sales while also adding value to the product. Packaging can also be used to improve the image of a product and differentiate it from other products on the market.

Aside from that, packaging can provide consumers with information about the company and the product. For example, product and company information, slogan words, ingredients, nutrition value, net weight, and bar code. Furthermore, packaging can convey important product information such as how to use and store the product, brand identification, and price. This educational kit will, of course, help students and teachers during learning and teaching sessions, particularly in the subject and field of robotics. Apart from being able to increase the impact in education, it can also have a more positive impact on teachers and students. After the product has been packed, it will be easier to handle. It also depends on the suitability of the material used in the product's packaging. This product is handled from the time it is packaged at the cafe until it reaches the hands of the consumer.

3.0 Methodology

Design and concept thinking in education is a way of thinking about learning, collaboration, and problem solving. The design process is a structured framework for identifying challenges, gathering information, generating potential solutions, refining ideas, and testing solutions. Design Thinking can be used in a variety of ways, including as a framework for course design or as a road map for an activity or group project. The teaching and learning can provide a variety of support for design and concept thinking in education including design consultation, brainstorming kit and physical prototyping kit which is can used for project, session and courses including active learning and facilities strategies. Meanwhile in education, teaching materials are important not only for improving student achievement in the classroom, but also for improving student understanding of the subject. Students can be more creative and learn new things more quickly. Teachers provide students with a broad understanding of co in relation to everyday materials. Various examples and activities with the teaching kit ultimately improve the overall performance of the students. The design process is well established in fields such as engineering, architecture, and computer science, and consists of the basic steps of planning (analysis and design), development, implementation, and evaluation (refer to the figure below). The design process is frequently initiated by a need, a problem, or a challenge

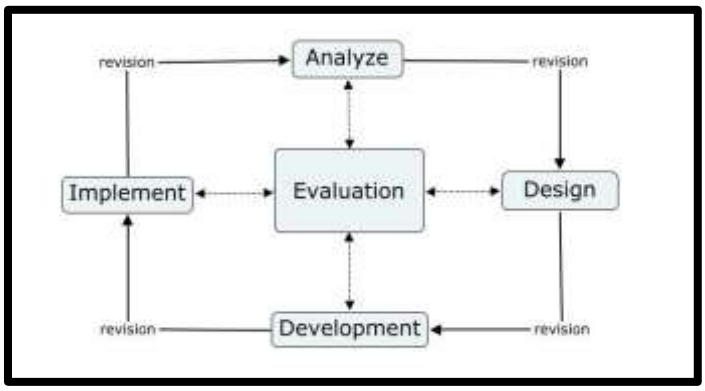

Fig. 2 : ADDIE Model By Fav203

The design process can be used in higher education to develop, renew, and improve any aspect of learning and teaching. Curriculum design, task design, spatial design, classroom layout, assessment design, curriculum alignment, instructional design, human-computer interface design, programmed instruction, adaptive technological systems, and pedagogical design are a few examples. Teaching itself is increasingly described as a designerly task (Laurillard, 2012; Brown & Edelson, 2003; Goodyear, 2015).

Fig. 3 : Old Packaging

Fig. 4 : KidCadTech STEM Module Solution

Fig. 5 : 3D Mock Up

4.0 Findings

When education becomes part of human life, education is, of course, the main goal of progress. Talking about the development and creation of something modern that is more sophisticated and, of course, seeks to promote human work. These changes and innovations are necessary because they must keep pace with the rapidly changing modernization trends. It is also also important to build and develop a package in order to satisfy the ever-changing demand, depending on the situation and needs. The reforms centered on how to collect and bundle all the kits required for education in a box used for education. Besides that, its also has its own Augmented Reality (AR) which enables digital information to be superimposed and integrated into our physical environment. **AR** is a tool that can help us transform our immediate surroundings into learning, work and entertainment spaces as its novelty. Next, this education module box also has used the benefit of social media which is filter that been used in taking photos or selfie can be used as education purposed. On this box its contains QR Code so that the student can download our own Instagram filter to be used as to attract others to joins robotic.

The invention of a KidCadTech Stem Module Solution begins with using a fluted box for a printed product that can be used as an educational tool. This Stem Module Solution innovation can be viewed as a structured material set for the time being. A Stem Module Box for Education may support a course purpose, a course target, a subject, a principle, or a theme. Instructors can set a structured path through the content objects using a storyboard or a collection of dependencies. Understanding the first notion relies on knowing the second notion. Alternatively, teachers may encourage learners to explore the content in any order and speed in a Learning Module. Education is the most critical factor of everyday life to make it more advanced. Information is often divided into hundreds or even thousands of elements, and technology and robotics are some of their sciences. It contains hands-on instructional kits when it comes to innovation and technology. An education module box with almost all the kits used to learn about technology and robotics was born in this respect. Pleasure is also required in the best way and method when finding information. This product makes it essential for teachers and students to build and use this box for this education module.

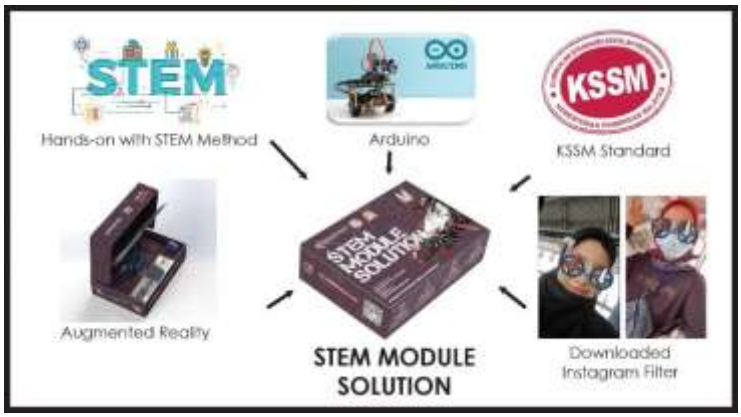

Fig. 6 : Innovation & Added Value

Fig. 7 : QR Code & Augmented Reality

5.0 Discussion

At the end of the education and learning process, teachers are also able to achieve the expected learning goals in every subject. In a study by Jasmi et al. (2011), kit aid is a means of enhancing the efficiency of student-centrated learning by teachers. In their study, teachers participated only 25% in the classroom. The abstract content can also be explained by using the learning kit. This facilitates students' understanding of the subject (Mohsin & Hassan, 2011). Indirectly, the use of right and multi-faceted learning kits can achieved students' passive behaviour because they can stimulate the students' interest in continually participating and motivating and wanting to learn about education (Nurhanim Saadah et al.,2013). Learning is therefore no longer dependent on traditional equipment as a medium for education, like chalk, blackboard and textbooks (Ahmad Zanzali & Daud, 2010; Haizum Hanim Ab. Halim & Lai, 2011). Lernkits therefore play an important part not only in enabling students to understand a concept easily in their teaching and education, but also to attract them. The utilisation of teaching kits in education and learning is an alternative to teaching and learning success. The role of teachers is essential to

6.0 Conclusion & Recommendations

A quality educational kit starts with an attractive way of packaging and has its own distinctive appeal. the results of this research have clearly shown a good impact on consumers especially its use in the education sector. printing quality and design are the most critical aspects in producing a quality printing box. when it comes to education, of course, it is a sector that has no limits, but the aspect of delivery in education is the most emphasized. Various suggestions and views we need to take as a starting point to something greater and quality. building a brand in education should also emphasize the quality aspect for use by students. we must take the initiative in always trying to

convey something useful. The effectiveness of this Robotic Module Box surely can be a recommendation for future reseacrh depending on how its will give an impact through learning in classroom.

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