Introducing Mathematics Learning Media to Students of An-Nikmah Al-Islamiyah Institute At Phnom Penh Foundation School Cambodia

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ABSTRACT

This community service aims to introduce various learning media to enhance students' understanding of mathematics at the An-Nikmah Al-Islamiyah Institute in Cambodia. Using mixed-methods approach involving surveys, interviews, and classroom observations, this study found that the use of digital media such as interactive math applications, as well as concrete teaching aids, significantly improved student engagement and learning outcomes. The results of this research provide recommendations for further development of mathematics learning media in Cambodia.

Introduction

Cambodia is a country in the Southeast Asia region with the official name being the Kingdom of Cambodia with the country's capital located in Phnom Penh City. Geographically, the country of Cambodia is located on the Indochinese Peninsula with a land border in the north with Laos and Thailand, in east and south with Vietnam and west with the Gulf of Thailand (country map Cambodia). The country of Cambodia is a developing country consisting of surrounded by lowland land mountains in the north and southwest and to the east where the Mekong River flows to Vietnam South.

Since the early 2000s, Cambodia has embarked on a comprehensive education reform program aimed at increasing access, improving quality, and promoting equity. While significant progress has been made in expanding primary and secondary education, challenges remain in terms of teacher training, curriculum development, and infrastructure improvement" (Smith & Chan, 2022). Cambodia has made notable progress in expanding access to education; however, the focus must now shift to improving learning outcomes. This requires targeted interventions, such as curriculum reform, teacher capacity building, and investment in learning resources, to ensure that students not only attend school but also receive a quality education" (Menon & Lam, 2021).

Mathematics education in Cambodia has experienced various challenges and developments over the last few decades. After a long period of conflict and political instability, the country's education system, including mathematics education, is in the process of recovery and development. The Cambodian government together with various international organizations has made efforts to

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improve the quality of education, especially in the fields of science and mathematics, which are considered essential for economic and technological development (Ministry o Educatin, Youth and Sport, 2020; UNESCO, 2021). Currently, mathematics education in Cambodia is faced with several main issues, such as a lack of adequate resources and facilities, limited trained teaching staff, and a curriculum that needs to be adapted to international standards (World Bank, 2018). However, there are various initiatives and programs designed to address these problems. One example is a teacher training program that focuses on increasing competence in teaching mathematics, as well as providing better and more relevant teaching materials (Smith, 2020).

At primary and secondary school levels, mathematics is taught as one of the core subjects. However, student learning outcomes in this area still show a need for improvement. Based on the results of educational surveys and evaluations, many students still experience difficulties in understanding basic mathematical concepts. This is caused by several factors, including traditional teaching methods and the lack of use of technology in the teaching and learning process. Despite increasing access to education, the quality of mathematics teaching still needs to be improved through more innovative and interactive approaches (Smith, 2020).

In the current digital era, we need to increase our knowledge about information and communication technology, because technology is developing rapidly every day. A person's ability to use digital technology to obtain information and use communication tools to interact effectively is called digital literacy (Casey, 2016). Digital literacy is the skill of using digital media, or networks in finding, evaluating, creating information and using it wisely, so that good relationships can be built in everyday life (Indrawati, 2021). Currently, one of the importance of digital literacy is for socialization activities for development programs, which are no longer sufficient to rely solely on conventional media (Achmad Buchori, 2018). Therefore, we are all required to understand how to use technology, especially information and communication technology that we use every day, namely cell phones or what are usually called gadgets. And changes in the order of people's lives have been felt as a result of the influence of the internet.

Education plays an important role in the development of a country, and learning media is a crucial component in the educational process. In Cambodia, a country that is still in the developing stage with a long history of conflict, education faces various challenges. One of the biggest challenges is limited access to quality educational resources. According to the World Bank (2018), the quality of education in Cambodia is still lagging behind compared to neighboring countries in Southeast Asia.

Learning media has great potential to overcome some of these limitations. By using appropriate learning media, teachers can deliver lesson material more effectively and interestingly for students. This is important in the Cambodian context, where educational infrastructure is still limited and many remote areas are difficult to reach by conventional educational facilities. For example, research by Unesco (2019) shows that the use of educational technology in rural areas of Cambodia can increase student participation and learning outcomes. Innovative and effective learning media can be a solution to improve the quality of mathematics education. This research focuses on the application of various learning media, both digital and non-digital, in teaching mathematics in An-Nikmah Al-Islamiyah Institute Cambodia. Previous studies by Chea and Chen (2018) showed that the use of technol ogy in learning can increase students' motivation and understanding of lesson material.

Methods

Design Stages

This activity is conducted through socialization and training to implement digital mathematics literacy using mathematics learning applications. Through this socialization, students are expected to understand how to apply digital mathematics literacy. Therefore, further training is provided so that students can directly use the mathematics learning application. In this training, the author applies a direct training method to provide practical experience to the participants.

Preparation Stages

a. Preparation Stage

- Needs Identification: Evaluating the educational needs and student interest in mathematics, even though there is no formal math instruction. This assessment is conducted through surveys and interviews with students to understand the potential for implementing math learning media.
- **Literature Review**: Reviewing literature related to the use of mathematics learning media in the context of non-formal education or situations where mathematics is not officially taught.

b. Data Collection Stage

- Needs Survey: Using questionnaires to identify students interest in mathematics and

learning media. The survey also includes questions about available technology and readiness to implement new learning media.

- **Environmental Observation**: Observing the school environment to assess the readiness of infrastructure and the feasibility of implementing learning media, including the accessibility of technological devices and internet connectivity.

c. Implementation Stage

- Introduction of Learning Media: Introducing various mathematics learning media, such as interactive applications and educational videos, through an introductory program designed to engage students.
- **Workshops and Training**: Conducting training for students on how to use mathematics learning media and its benefits, even in the absence of formal mathematics instruction.
- **Demonstration Activities**: Organizing demonstration sessions with students to show how mathematics learning media can be used in enjoyable and engaging learning activities.

d. Evaluation Stage

- Post-Implementation Data Collection: Collecting data through surveys and interviews after the implementation of learning media to assess its impact on students interest and engagement in informal mathematics learning.
- Data Analysis : Analyzing the data to evaluate students responses to the learning media and the potential integration of mathematics into other existing learning activities.

Results and Discussions

This community service initiative encompasses the components of counseling, practical application, and assessment. The programme description is elucidated as follows :

The act of giving counselling services or distributing relevant materials.

Instructure: Zakkiyah, M.Si

Material: Introduction of Mathematics Learning Media to Students at An – Nikmah Al – Islamiyah Institute

1. Results

a. Interest and Readiness for Mathematics Learning Media

Survey Result: The conducted survey revealed that although mathematics is not formally taught, 75% of students expressed a high interest in the introduction of mathematics learning media. The majority of respondents believe that such media could enchance their knowledge and skills beyond the official curriculum.

Table 1. Survey Table

Criteria	Respondent Percentage (%)
Students show a high interest in mathematics learning media.	75%
Respondents feel that this media can enhance their knowledge and skills.	Majority

Environmental Observation**:** Observations indicate that the school's infrastructure, including access to technological devices and internet connectivity, is adequate to support the use of learning media, although there are some limitations related to inconsistent internet access.

Table 2. Observation Table

Aspek	Keterangan
School infrastructure	Adequate to support media use
Access to technological devices	Available
Internet connection	Inconsistent, there are some limitations

Impact of Introducing Learning Media

Demonstration Activities **:** During the demonstration session, students showed high enthusiasm and engagement. They actively participated in activities involving interactive math applications and educational videos. These activities sparked students' interest in learning more about mathematics informally.

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Figure 1. Teaching Mathematics Learning Media

Figure 2. Introduction to Learning Media

Feedback from the Workshop : Teachers reported that the workshop provided a better understanding of how to use learning media to integrate mathematical elements into other learning activities. They also identified several creative ways to incorporate mathematical concepts into other subjects being taught.

c. Challenges in Implementation

Technical Issues **:** Some students faced technical difficulties, such as limited access to devices or problems with internet connectivity, which affected their engagement in media-based activities. Additionally, language barriers were a major factor, as only a few students were able to speak English or Malay.

2. Discussion

a. Student Interest and Engagement

Positive Response to Learning Media **:** These findings are consistent with studies showing that engaging learning media can enhance student interest and engagement, even in non-formal education contexts (Miller & Johnson, 2019). Although there is no formal mathematics curriculum, the introduction of this media was able to spark students' interest in mathematics.

Active Student Engagement**:** The demonstration activities showing active student participation support the theory that media-based learning can make lessons more interactive and engaging (Smith et al., 2021). This suggests that even though mathematics is not formally taught, there is great potential to increase student interest through relevant learning media.

b. Challenges Faced

Infrastructure Limitations : Technical issues faced by students, such as limited access to devices and internet connectivity problems, are common challenges in educational settings in developing countries (Wang, H., & Lee, J. 2020). This highlights the need for improved infrastructure and accessibility to support the more effective implementation of learning media.

c. Recommendaions

Infrastructure Development **:** To address accessibility issues, it is recommended that the school improve its technological infrastructure, including enhancing internet connectivity and providing adequate devices for students.

Ongoing Training **:** Provide additional training for students on how to use learning media effectively and how to integrate mathematical elements into various learning activities.

Monitoring and Evaluation **:** Conduct regular monitoring and evaluation of the use of learning media to assess its impact on student interest and engagement, as well as to evaluate the potential for further integration into the curriculum.

These findings and discussions provide insights into how mathematics learning media can be introduced and accepted at Institut An-Nikmah Al-Islamiyah, even though mathematics is not formally taught. They also identify challenges that need to be addressed and offer recommendations for further development.

Conclusions

The community service team known as "Introduction of Mathematics Learning Media to Students at An-Nikmah Al-Islamiyah Institute Phnom Penh, Cambodia" successfully and efficiently carried out activities that positively impacted the valuable knowledge acquisition of the students and teachers. The evaluation conducted by partners resulted in highly satisfactory scores for the implementation team. The partners also expressed deep gratitude and optimism about the potential for the long-term sustainability of this effort. Besides strengthening relationships among students, the mathematics learning media activities in the classroom provided new experiences for students and reduced boredom related to the learning process. Involving students in experiential learning activities will encourage their participation and engagement. The introduction of mathematics learning media at An-Nikmah Al-Islamiyah Institute Phnom Penh has significant potential to increase student interest and engagement, but further efforts are needed in terms

of infrastructure development and teacher training to support more effective implementation.

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