Effectiveness of Health Education Course E-Modules Based on Android Applications for Students majoring in Physical Education, Health and Recreation

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Abstract. Efficacy of Android-based e-modules for health education courses for students majoring in Physical Education, Health and Recreation is the objective of the study. The study methodology employs quantitative descriptive analytic approaches. Effectiveness data analysis method is derived from the outcomes of Pretest and Posttest. The testing research instrument is a measuring tool used to gather data on student learning outcomes in Android Application-Based Health Education courses that use e-modules. The study population for the Physical Education, Health and Recreation students in the third semester of 2022 comprises 180 students drawn from 6 classes (C-I). This study sample was randomly picked from a single class, namely Class G Regular 2022, which consisted of a total of 32 pupils. The efficacy assessment of the e-module for health education courses using Android apps revealed that the mean student score rose from 63.75 in the "Incomplete" category in the Pretest to 86.25 in the "Completed" category in the Posttest. The study concludes that Android apps serve as useful e-modules for health education courses among students majoring in Physical Education, Health and Recreation.

Keywords: Effectiveness, Health Education, E-Modules, Android, Applications

1 Introduction

The significance of examining the efficacy of e-modules for Health Education courses using Android apps for students specialising in Physical Education, Health and Recreation is crucial, given the fast advancement of information technology and the need for efficient health education. In this particular setting, e-modules, as a digital learning medium, provide a novel method that has the potential to enhance students' comprehension and proficiency in the field of healthcare. Prior studies indicate that using multimedia modules into health education instruction might greatly enhance students' understanding and attitudes [1] [2]. The aforementioned demonstrates that professionally crafted electronic modules have the potential to serve as a very efficient instrument for imparting health education content to students.

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Efficient implementation of e-modules must consider the aspect of educational material attractiveness. Studies indicate that e-modules developed using applications such as Flip PDF Professional are not only legitimate but also appealing to students [5]. [6]. This is important because interesting material may enhance students' motivation to learn, which ultimately has a positive impact on learning outcomes. Furthermore, well designed e-modules may assist students in comprehending complex health concepts in a more straightforward and easily understandable manner [7].

Within the context of physical and health education, e-modules may be used to provide information on healthy lifestyle, nutrition, and disease prevention. Research indicates that using e-modules in physical education learning might enhance students' knowledge and skills in applying principles of health in daily life [8]. In addition, e-modules may also serve as a source of information accessible to students for in-depth study of certain topics related to health, therefore enabling them to become agents of change in society [9].

Implementing Android apps as e-modules for Health Education courses for students specialising in Physical Education, Health and Recreation is a deliberate measure to enhance the efficacy of health education programming. By using information technology, e-modules may serve as a potent instrument in disseminating health education content, enhancing students' understanding and abilities, and equipping them to confront health issues in society. The primary objective of this study is to assess the efficacy of the E-Module for Health Education Courses, as implemented using Android Applications, for students pursuing a degree in Physical Education, Health, and Recreation.

2 Method

The efficacy of the Android application-based Health Education e-module for students majoring in Physical Education, Health and Recreation may be evaluated using a quantitative descriptive analytical research technique. This methodology enables researchers to methodically and objectively report and analyse data collected from respondents. The primary objective of quantitative descriptive study is to provide a comprehensive assessment of the efficacy of e-modules in enhancing students' knowledge and abilities in the domain of health education [11].

The subject population comprises 180 students enrolled in Physical Education, Health and Recreation, majoring in semester 3, class of 2022, distributed across 6 classes (C-I). Statistical sampling may be performed randomly to guarantee the representativeness of the data. This study sample was randomly picked from a single class, namely Class G Regular 2022, which consisted of a total of 32 pupils. The testing research instrument is a measuring tool used to gather data on student learning outcomes in health education courses that use e-modules developed for Android apps. Effectiveness research methods are derived from the statistical analysis of Pretest and Posttest outcomes. Following the collection of data, descriptive statistical methods were used for analysis. To assess the efficacy of e-modules, student learning results are compared both before and after the implementation of e-modules. Utilising pre-test and post-test methodologies to assess the development of student knowledge and skills subsequent to the implementation of the e-module. Presented below is an image depicting the study design.

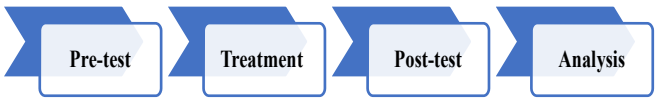

Fig. 1. Research Design Pre-Test and Post-Test

Explanation:

1. Pre-test: Students undergo an initial assessment to evaluate their starting level of knowledge and abilities.
2. Treatment (Utilisation of e-Modules): Students acquire knowledge by engaging with e-modules that provide interactive educational resources.
3. Post-test: Students undergo an assessment after the use of the e-module in order to quantify their progress.
4. Analysis: Comparing the results of the pre-test and post-test to evaluate the efficacy of the e-module.

A statistical analysis method that determines its efficacy by analysing pretest and posttest outcomes. The efficacy of the Android application-based Health Education e-module for students specialising in Physical Education, Health and Recreation is assessed by analysing the test scores of students' learning outcomes after the completion of task-based activities. Effective e-learning modules are defined as those in which the average student learning outcomes satisfy traditional completion requirements, specifically when students obtain or surpass the minimal qualifying score. Student learning outcomes may be expressed using the following formula.

$$\textbf{Student Grade} = \frac{The\,number\,of\,questions\,is correctng}{Total\,number\,of\,questions} \quad [12]$$

In addition to administering pretest and posttest questions, students are evaluated on their ability to apply practical content delivered in the e-module for health education courses both before and after utilising the materials. Analysis of data pertaining to the enhancement of students' Health Education abilities was conducted using percentage analysis. Successful

completion of the study is indicated by a test score of 70 or above. Total score may be computed using the following formula:

$$Average\,Competency\,Score = \frac{Score\,obtained}{Total\,Score}\,X\,100\,\% \quad [13]$$

The evaluation criteria for enhancing students' Health Education abilities are shown in the table below:

Table 1. Health Education Skills Assessment Categories

Interval Score	Categories
80-100	Very Skilled
70-79	Skilled
60-69	Enough
45-59	Not enough

3 Results and Discussion

An evaluation was conducted to assess the efficacy of e-modules for Health Education courses using Android apps for students specialising in Physical Education, Health and Recreation. The objective was to determine the influence of the learning media that had been previously established in research. An Android application-based Health Education course modules may be deemed useful for usage in the learning process if the student learning outcomes achieved both increased and met the minimal completeness criterion. To assess the efficacy of the Android application-based e-module for Health Education courses, researchers administered pretest and posttest questions to students. This document presents the results of the pretest conducted on students prior to their use of the Android application-based Health Education e-module.

Table 2. Results of Student Pretest Scores

Pretest Value	
Number of Values	2.040
Average	63,75
Category	Enough

Table 3. Results of Pretest Scores for Health Education Skills

Health Education Skills Pretest Scores	
Number of Values	1.925
Average	60,2
Category	Enough

Based on the pretest results acquired by students, it may be inferred that a significant number of students did not finish the test due to their failure to achieve the established minimum

completion requirements. The mean score generated by students in the pretest results was 63.75, falling inside the "Enough" category. Meanwhile, after the evaluation of students' everyday educational abilities before to utilising e-module media (pretest), an average score of 60.2 was achieved in the "Enough" category. Following the use of the Android application-based Health Education e-module, the table below displays the posttest results of the students.

Table 4. Results of Student Posttest Scores

Posttest Value	
Number of Values	2.760
Average	86,25
Category	Complete

The analysis of the posttest scores in table 4 indicates that the performance of students in Health Education courses has improved to 86.25 in the "Completed" category after utilising the Android application-based e-module. Meanwhile, the table below displays the health education skills scores of students attained after utilising the Android application-based Health Education e-module (posttest).

Table 5. Posttest Assessment of Health Education Skills

Health Education Skills Posttest Score	
Number of Values	2.735
Average	85,5
Category	Very Skilled

From the data shown in table 5, it can be inferred that the health education skills scores of students have improved to 85.5 in the "Very Skilled" category after utilising the e-module for the Android application-based Health Education instruction. In addition, the table below illustrates the improvement in student learning outcomes before and after the implementation of the Android application-based e-module for Health Education instruction.

Table 6. Student Pretest and Posttest Scores

	Pretest Value	**Posttest Value**	**Explanation**
Amount	2.040	2.760	Increase
Average	63,75	86,25	

Furthermore, the enhancement in students' health education abilities before and after using the e-module may be shown in table 7 below:

Table 7. Pretest Posttest Scores for Health Education Skills

	Pretest Value	**Posttest Value**	**Explanation**
Amount	1.925	2.735	Increase
Average	60,2	85,5	

An analysis of the pretest and pottest computations revealed that the mean score on the pretest was 63.75, but the mean score on the posttest was 86.25. Empirical evidence indicates a

significant improvement in student academic achievements both before to and after the implementation of the Health Education e-module in the Android application. The pretest score for students' health education skills measured 60.2, whereas the posttest score after using the Android application-based e-module for Health Education courses was 85.5. This indicates a significant improvement in students' health education skills both before and after using the Android application-based e-module for Health Education courses. Thus, it can be inferred that the Android application-based e-module for Health Education courses has been officially validated as effective.

The predetermined minimum level of completion for health education courses at the Department of Physical Education, Health and Recreation is 75. An analysis of effectiveness assessments conducted on 32 students in class G Regular 2022 revealed that the average student learning outcomes were 63.75 in the pre-research stage and climbed to 86.25 at the post-research stage. The student completion rate has shown a rise, rising from an initial 12.5% of students who met the minimal completion requirement to 90.6% of students who met the minimum completion criteria. Furthermore, the utilisation of the Android application-based e-module for Health Education courses resulted in a notable enhancement in students' health education abilities both before and after use. The first assessment achieved a score of 60.2 in the "Fair" category, which then rose to 85.5 in the "Very Skilled" tier. Effective learning media may be defined as those that successfully achieve the intended goals of the media and are evident in the learning outcomes of students throughout the learning process [14].

Based on the research report, the preliminary stage and conclusion of the study have improved and have met the minimal scoring criteria. In addition, there has been an increase in the number of students who have completed their studies both before and after using the e-module learning media. Furthermore, there has been an improvement in the skills related to health education among students both before and after using the e-module media. Final results indicate that the android-based e-module for the subject of Health Education is effective for use in the Health Education Curriculum of the Department of Physical Education, Health, and Recreation.

The use of e-modules in health education courses using Android apps for students in the Department of Physical Education, Health and Recreation demonstrates notable efficacy in enhancing students' proficiency and competencies. empirical evidence indicates that the incorporation of digital technology, such as mobile apps, has the potential to enhance the educational process and provide more favourable results in health education. A comprehensive analysis revealed that digital educational treatments, including virtual simulations and computer-based learning, led to substantial improvements in knowledge when compared to control groups. However, two research reported no notable disparities in learning results [15]. This implies that effectively conceptualised electronic modules may provide comparable advantages in the field of health education.

Employing mobile technologies in health education facilitates enhanced interactivity and collaboration in the learning process. A range of intervention methods, such as mobile phone apps, may provide dynamic learning settings that offer immediate feedback and facilitate thorough debates on pertinent subjects [16]. This study highlights the significance of mobile learning techniques in health education, since they have the potential to enhance student involvement and academic achievements [17].

4 Conclusion

A study on the efficacy of e-modules in health education courses utilising Android apps for students specialising in Physical Education, Health and Recreation found that there is a significant improvement in student learning outcomes both before and after the implementation of e-modules. Experimental evidence demonstrated that the mean student learning results during the pre-research phase were 63.7, but after the research phase, it rose to 86.25. Moreover, the student completion rate was shown to have risen. The pretest yielded a 12.5% rate of students who met the minimal completion criterion, which subsequently climbed to 90.6% total. Furthermore, there was a notable enhancement in the educational abilities of pupils both before and after using the e-module. The first assessment achieved a score of 60.2 in the "Fair" category, which then rose to 85.5 in the "Very Skilled" tier. Indeed, the use of e-modules in health education using Android apps for students specialising in Physical Education, Health and Recreation has shown its efficacy in enhancing student learning results. Moreover, in order to get the best possible outcomes, it is necessary to focus on user training, system preparedness, and instructor proficiency in using digital technology for future study.

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