Mobile Learning as a Research-Based Learning Media of Maternity Nursing to Educate Undergraduate Nursing Students

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Abstract. Research-based learning is the most recent breakthrough in maternity nursing. Learning occurred online during the COVID-19 epidemic. Mobile learning (m-learning), which is the most user-friendly platform for students to use since it is a given that every student has a smartphone (cell phones). Through an Android-based m-learning application, this study aims to design and develop the device for research-based learning (RBL). Beginning in August 2020 and running through October 2020, the research method is a research and development technique for undergraduate nursing students. At the descriptive stage, all students are sampled using total sampling. Random sampling was used for the trial phase, which included 96 students in each group. On the student group receiving intervention through the m-learning platform and the control group receiving traditional instruction, a comparative was conducted. The survey was administered using Google Forms, and Google Meet was used for the evaluation. Data were evaluated using descriptive and analyzed using Anova test. The findings revealed that 96% of students were highly need for online learning, 74% of students had an immediate need for an m-learning platform, 74% of students benefited from RBL learning platform, and extremely useful applications, 88% of students had network issues, and 89% of students had low time efficiency. The RBL approach using the Android-based m-learning application is more effective at increasing learning outcomes, as evidenced by the results of the various tests on learning outcomes, which indicate p 0.001 for treatment and p control of 0.017. An effective and efficient online learning system for maternity courses that may be used by nursing students will be developed using an Android-based mobile learning platform.

Keywords: research-based learning · online learning · application · platform · m-learning · maternity · nursing · student

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1 Introduction

Research-based learning (RBL) in the scientific development of maternity nursing can lead students to obtain various benefits in the context of developing assimilation and application of knowledge that can be learned during the learning process [1]. Innovation in RBL practice is needed to facilitate students in the learning process, enjoy up-to-date learning methods, and, most importantly, improve student graduation competencies. Research-Based Learning tools were developed based on the results of research conducted by lecturers and compiled based on the strategies and learning methods used in the research-based learning approach. The research-based learning model provides opportunities and courage for students to actively engage in the process of learning. Effective learning guides students to master knowledge and understanding of course material and reach the highest level of education and creation [2].

Students must engage in active learning, work independently, and are not constrained by the time or space allocated for classes on campus because of the innovative learning model used in RBL. The internet is heavily utilized while looking for learning statistics and information to assist RBLs. Students rely heavily on the network connection at all times and locations, in addition to being more productive and effective in every way [3, 4]. Learning ensued online during the COVID-19 epidemic (on the internet). As a consequence, learning is done entirely through the use of the internet.

Rapid technological and internet development can encourage education and learning system changes. Digital learning supported by mobile technology provides opportunities for students to connect textual knowledge with their real-life environment. Facing a pandemic while prioritizing optimal learning objectives, namely by using online learning, has quickly overtaken traditional classes in popularity [5]. These technological advances have brought tremendous changes to the world of education. It is essential to discuss how digital technologies are being used in nursing education. Mobile learning applies to a wide range of contexts and disciplines. Information may be played back, and students can learn at their schedule to achieve self-directed learning, in which students can continually exercise specific knowledge and talents without constraint [6–8]. It was discovered that mobile technology's online teaching platforms could help nursing students learn in real-world medical settings [9]

It was discovered that mobile technology's online teaching platforms could help nursing students study in real-world medical settings [9]. According to Aparicio, F. Bacao, and T. Oliveira [10], the future development of online learning systems has enormous potential. Android phones are the most user-friendly learning tool for students and teachers during the current pandemic. Therefore, it is necessary to develop an RBL application model in maternity nursing courses through the Android platform so that students can actively and independently participate in learning by downloading the RBL application on their mobile phones. The online learning platform through this Android-based learning platform will grow more to increase the competence of nursing students in the future according to the needs in the field following the times [11–13]. The objective of this research is to identify a description of the results of the needs analysis for the preparation of RBLs online and produce RBLs for maternity nursing through an Android-based m-learning platform.

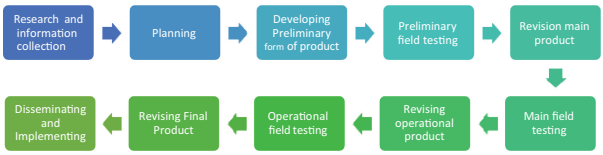

Fig. 1. R&D method steps (Borg& Gall, 1993)

2 Method

The research and development approach [14–16] for undergraduate nursing students at Institute of Health Science Bina Sehat PPNI Mojokerto from August 2020 to October 2020. Expert discussions were carried out through Focus Group Discussions (FGD). Two IT experts and three maternity nursing material experts carried out application validation. Inclusion criteria are undergraduate nursing students who received maternity nursing courses. Exclusion criteria refused participation; students who did not have a mobile phone had previous experience in online learning (Fig. 1).

The sample at the descriptive stage is all students using total sampling in the limited trial phase using random sampling on 40 students who were divided into two groups. After a little trial, revisions were made based on input from experts and student responses. Furthermore, a re-test was carried out on the application that had been repaired on 96 students in each group. Comparative analysis was carried out on the student group with the treatment group through the Android-based m-learning platform application and the control group with conventional learning.

The data collection instrument used a questionnaire via a google form, a learning android application for the treatment group for the learning control group and evaluation through google meet. The device used in this research is a questionnaire. Questionnaires were given to students in the form of respondent characteristics, use of tools to access the internet, and analysis of needs for online learning using mobile learning applications. Data were analyzed using a descriptive and different tests. Appropriate ethics by KEPK of Institute of Health Science Maluku Husada with number RK 07/KEPK/X/2020.

3 Result

Based on the research results obtained data, most m-learning users are female students, as much as 90%. Most respondents use cell phones to access learning, which is 60%. The need for online education is very high at 69%, and the ability to use applications at 47% is very proficient. This application is felt to be very useful by students; as much as 69% of the rest only find it useful. The problem experienced by students when learning online is if there is network disturbance experienced by 88% of students. There was an increase in student learning outcomes by 100% (Table 1 and Table 2).

The findings revealed no change in the pretest of RBL in maternity nursing values for the treatment and control groups, namely 59.99 and 58.44. The results showed that the pretest of RBL in maternity nursing values in the treatment and control groups, 89.77 and 78.44, barely differed statistically. There was an increase in the value of learning

Table 1. CHARACTERISTIC RESPONDENTS

Characteristics		**Prosentase (%)**
Sex	Male	10
	Female	90
Device	Handphone	60
	Handphone and laptop	40
Online learning needs		
	Urgently require	69
	Need	27
	Less need	4
Skills online learning		
	Very proficient	47
	Proficient	45
	Less proficient	8
Benefits of research-based learning in maternity nursing online courses		
	Very helpful	69
	Beneficial	27
The need for research-based learning in maternity nursing courses through the *Android-based* m-learning app		
	Urgently require	74
	Need	26
Online Learning Barriers		
	Network Disturbance	88
	Time efficiency	89
Prospects of Research-based Learning in Maternity Nursing courses through an *Android*-based m-learning platform		
	ImprovedLearning Outcomes	100
	Opportunity to pass the Competency Test	100

a. (Primary data, 2020)

outcomes from the experimental group after the intervention, which increased from 59.99 to 89.77 (Table 3).

The Anova test has been used for data analysis. Testing for normality is one of the criteria for the ANOVA test. The experimental group's normality test results indicated p=0.163. If the normality test is more than 0.05, it is considered normal. A value of Greenhouse-Geisser p = 0.008 must be used to determine the degree of significance after the findings of Mauchly's Test of Sphericity with a confidence level of 0.05 reveal

Table 2. THE RESULTS OF THE DESCRIPTIVE ANALYSIS OF RESEARCH-BASED LEARNING THROUGH M-LEARNING

Variables	Groups	Pretest Mean±SD	Post-Test Mean±SD
Learning Outcomes	Experiment	59.99±5.47	89.77±16.58
	Control	58.44±3.59	78.55±14.60

b. (Primary data, 2020).

Table 3. THE EFFECTIVENESS OF RBL IN MATERNITY NURSING THROUGH THE M-LEARNING PLATFORM

Group	Model	Sum of Square	Mean Square	F	Sig
Experiment	Sphericity Assumed	1021.308	341.103	10.678	.001
	Greenhouse-Geisser	1021.308	819.018		.008
Control	Sphericity Assumed	76.675	26.2283	4.068	.0017
	Greenhouse-Geisser	72.674	42.818		.055

c. (Primary data, 2020)

the $p = 0.001$. This indicates improved learning outcomes in the treatment group of RBLs in maternity nursing using the Android-based m-learning application.

The control group's normality test results indicated p=0.172. If the normality test is more than 0.05, it is considered normal. With a confidence level of 0.05, the findings of Mauchly's Test of Sphericity provide a value of $p = 0.0017$; nevertheless, the significance level must be determined by examining the Tests of Within-Subjects Effects table, where the importance of Greenhouse-Geisser $p = 0.055$ indicates the level of significance. This suggests that there is an improvement in learning outcomes in the treatment group of RBLs in maternity nursing through conventional learning.

The treatment group and the control group's findings for comparing the two groups revealed p 0.05, indicating that there had been a substantial improvement in learning outcomes in both cases. The treatment of RBLs in maternity nursing using the m-learning platform is superior at enhancing student learning outcomes since the treatment group's p exhibits a smaller p number and the mean than the control group.

4 Discussion

The demand for undergraduate nursing students in online learning is robust because of the COVID-19 pandemic. Mobile learning applications are used in this research's output, which takes the shape of research-based learning media for maternity nursing courses. Most students use their mobile devices as learning aids during online classes, and most are skilled at using mobile learning programs. Students gain from the convenience of having access to learning resources wherever they are and the increased time efficiency

Fig. 2. The application's home screen

of mobile learning in addition to the critical requirement for it during the COVID-19 epidemic. However, challenges still arise while using mobile learning applications, namely when there is a network interruption (Fig. 2).

The primary outcome of this research is an increase in nursing student learning outcomes when research-based learning in maternity nursing courses is carried out through an Android-based learning platform. Online learning will significantly increase knowledge and positive learning outcomes [17, 18]. Since repetitions and online learning strengthen education and might assist students in comprehending challenging ideas and concentrating more intently on the subject, m-learning as an instructional tool makes new knowledge more reachable to students [19]. The students' disposition toward this novel learning setting is cheerful. They like this strategy's adaptability, ability to rapidly acquire learning resources, and enhanced technique of teacher-student interactions [20].

According to Park's research [19], participants who have used online self-instruction or being given permission to view a material repeatedly acquired and remembered more material than those who only had access to it during a single teaching method. The frequent use of the smartphone app may have aided students' practice and increased their confidence. In research comparing traditional lectures versus online learning, both groups demonstrated improved academic results, but the quality of knowledge and competencies was more excellent in the group that received instruction online [5, 21, 22]. By utilizing online study resources, people may learn at their own pace and according to their needs and interests [17]. Mobile phone-based learning offered a readily accessible platform and enabled self-review in this research.

The app's use was met with a high level of pleasure. This indicates that effective learning outcomes could help students satisfy their expectations and goals better. Given that many undergraduate students have been comfortable with cell phones, employing one to take a maternity nursing course can be an efficient teaching strategy. It has also been stated that students prefer online learning due to higher satisfaction [23–25]. Additionally, students felt that online learning was practical, affordable, and flexible and offered significant opportunities for scheduling study time [5, 26, 27].

Although there are undoubtedly benefits to utilizing mobile devices in the classroom, there are drawbacks, like the smaller screen and short battery life. Additionally, because cell phones can text and link to media platforms, among other features, these possible distractions may make it difficult to focus while studying [28]. One drawback of this

teaching strategy is the decrease in interpersonal connections and occasionally social isolation that results from using mobile devices as a tool for individual instruction [29]. An engaging teaching method, such as a smartphone app, might entice students. Still, the material must be accurate, comprehensive, and evident to them in a language they can quickly grasp.

This study discovered that teaching nursing students online was a successful strategy. Online courses provide a beneficial learning environment and improve acculturation by dramatically raising students' knowledge. Additionally, we will have to become proficient in the advancement of online classes and be ready for it [30]. Instead of using traditional techniques, nursing education should implement and utilize suitable e-learning. Online classes that are well-designed may be helpful additions for nursing students.

The impact of online learning on the continuity of the study's limitations was not investigated further. In addition, it would be advantageous to investigate the long-term implications of online learning, and further research is advised.

5 Conclusion

Analysis of the need for learning through the m-learning application is very high. This is evidenced by the readiness of students with internet access via handphones and laptops, proficiency in using online learning devices, and obstacles in the network at certain times. Research-based learning in maternity nursing through an m-learning platform effectively improves student learning outcomes at Institute of Health Science Bina Sehat PPNI Mojokerto. M-learning applications through Android have minimal memory, so they are easy to use on Android with even the lowest capacity and can be used for learning that is not limited by place and time. RBL in maternity nursing through the m-learning platform can be carried out well if done independently.

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