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Effectiveness Of Assemblr Edu To Improve Sub Cutaneous Skill Among Nursing Students In Yogyakarta Nursing College, Indonesia

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ABSTRACT

Introduction: Medication administration errors among nursing students are most common in nursing laboratories and health services. For this reason, sufficient skills are needed for students before they are assigned to practice in health services. Efforts to improve students' skills continue to be developed by nursing education in Indonesia. One form of educational media development is Assemblr edu. By using Assemblr edu about medication administration such as subcutaneous injection skill, it is hoped that students can access easily and quickly.
Purpose: To determine effectiveness of assemblr edu improving knowledge and skill of parenteral medication among nursing students in Yogyakarta Nursing College, Indonesia.
Method: The research is a quasi-experimental study with a non-equivalent group pre-test and post-test designed with control group. The research location at three nursing College in Yogyakarta.Respondents in this study in each group were 56, so the total respondents were 112 students.
Result : statistic test shows thant the Sig. (2-Tailed) value from the Independent Sample t-test as 0.000 or <0.05, indicating a difference in the mean scores between the post-test measurements of skills in the control and experimental groups.
Conclusion: There was a difference in the pre-post test scores related to skills subcutaneous between the control and intervention groups. The difference in post-test scores after the Assembler Edu intervention for administering medication between the control group and the experimental group indicates that the Assembler Edu platform is quite effective in enhancing the knowledge and skills of nursing students.

Keywords: *assemblr edu,, skill, subcutaneous medicationon*

INTRODUCTION

Appropriate patient medication administration one of the nursing student competencies that must be mastered. Lack of experience and clinical skill possessed by students can be the reason student feel dissatisfied with their clicinal experience (Chao *et al.*, 2021) . In certain cases, students are reported to have feeling of inferiority due to feeling arising due to the weakness or lack of knowledge and skill possessed by the students laboratory experiences (Melin-Johansson, Palmqvist and ..., 2017) . When students' clinical learning experience is not as expected, then learning innovation is is needed as an alternative to provide opportunities for students to master basic nursing skills and other specific nursing skill (Potter *et al.*, 2021).

There are existing intervention research to improve knowledge and skill. Several studies have also been conducted in nursing education field. Musharyanti (2021) use of the Four Components Instructional Design (4C/ID) model to improve knowledge and skill on medication savety(Musharyanti, Haryanti and Claramita, 2021). A Study from Dubovi et al (2017) found that virtual reality (VR) simulations could give students in higher education flexible and affordable access to practice the practical skills they need. This VR method is costly because it requires specialized goggles and expertise . (Dubovi, Levy and Dagan, 2017).Study from Purwokerto, Indonesia found that application about medication administration can improve knowledge student (Ratna, 2021). Media education like application has the disadvantage of limited access because it can only be downloaded using Android by downloading it from the Play Store. The application cannot be accessed through other devices, such as personal computers (PCs) or non-Android phones(Suleiman, 2020). However, the advantages of digital education media such as applications, virtual reality, games, or other models are that they can be accessed everwhere and whenever. The media uses a 3D design that can resemble the original situation. Besides that, the application proved to be more effective, interactive, and fun to use as a learning media for nursing (Kurt and Öztürk, 2021).

The issue with existing studies is that learning materials don't depict real-world situations, which makes them less engaging for students (Yue *et al.*, 2017). Its use creates its own pictures of actual situations and calls for certain tools and displays. Instructors had to work with information technology (IT) specialists and need special skills to create media like virtual reality or augmented reality, which required specialized knowledge (Carless-Kane and Nowell, 2023) . Because of this, the existence of this AR-based assembly is a solution to making learning media that is beneficial for educators and students. The educators don't need to be an expert coder to create AR content using Assemblr Edu's user-friendly interface (Vaida and Pongracz, 2022) . Using either an imported collection of assets or a library of pre-made ones, users may create interactive 3D models, animations, and scenarios. The development of modern learning media such as virtual reality or augmented reality has begun to be carried out by nursing educators, but the use of assembly education is still rarely developed for nursing because many educators are not familiar with this media (Qi, 2022). Assembling edu is considered more practical because it has provided objects related to education on the platform and does not require expensive tools or costs; it only requires a mobile phone. The use of assemblr edu base on AR is also a solution because can facilitate access to learning. The augmented reality technology developed by Assemblr Edu has the potential to completely transform education by increasing accessibility, interactivity, and engagement for learners of all ages.

MATERIALS AND METHODS

The research is a quasi-experimental study with a non-equivalent group pre-test and post-test designed with control group. This research to examine the effectivities of Assemblr edu subcutaneous medication on skill among nurse student. In a two-group experiment using pretest-posttest methodology with an added comparison group, the intervention group in the first group received Assemblr edu while the control group get manual modul of subcutaneous medication. The research location at three nursing College in Yogyakarta.Respondents in this study in each group were 56, so the total respondents were 112 students.Valid and reliable questionnaire will be used for data collection. Data processing, exploratory data, addressing missing data, and analyzing quantitative data with univariate, bivariate and multivariate analysis. The researcher will submit an ethical test at Lincoln University of Malaysia. This study also was approved by Research Ethics Committee, school of Health Science Wira Husada Yogyakarta No 626/KEPK/STIKES-WH/III/2024.

RESULTS

The demographic analysis of the respondents includes gender, age, and GPA. As presented in Tables 1 and 2.

Table 1. Demographics Profile of The Respondents Based on Gender

	Experiment Group	Control Group

No	Characteristics Gender	N : 58		N : 58	
		Frecuency	Percentage (%)	Frecuency	Percentage (%)
1	Men	9	15,5%	9	15,5%
2	Women	49	84,5%	49	84,5%
Total		58	100%	58	100%

Source : *Primary Data*, 2024

Based on the research findings in Table 4.2, it was found that all students, from both the experimental and control groups, were in their twenties. The majority age in the experimental group is 22 years old, with 37 students or (63.8%), while the minority age is 20 years old, with 2 students or (3.4%). In the control group, the majority age is also 22 years old, with 42 students or (72.4%), while the minority age is 20 years old, with 1 student or (1.7%).

Table 2. Demographics Profile of The Respondents Based on GPA score

No	GPA score	Experiment Group N : 58		Control Group N : 58	
		Frecuency	Percentage (%)	Frecuency	Percentage (%)
1	< 3	4	6,9%	11	19%
2	> 3	54	93,1%	47	81%
Total		58	100%	58	100%

Source : *Primary Data*, 2024

Based on the research findings presented in Table 2, it shows that the majority of the GPA scores in the experimental group are >3, with 54 students or (93.1%), while the majority of GPA scores in the control group are represented by 47 students or (81%)

Table 3. Pre-Post Test Skill of Subcutanoues Medication

No	Characteristics	Experiment Group N : 58		Control Group N : 58	
		Mean	SD	Mean	SD
1	Pre Test Skill	70,32	3,642	70,39	4,462
2	Post Test Skill	83,94	3,578	78,94	3,701

Source : *Primary Data*, 2024

From the research findings in Table 3., it was revealed that the experimental group's mean and standard deviation for pre-test skills were 70.32 and 3.642, while the post-test skills mean and standard deviation were 83.94 and 3.578. In contrast, the control group's mean and standard deviation for pre-test skills were 70.39 and 4.462, and the post-test skills mean and standard deviation were 78.94 and 3.701.

Table 4 Paired Sample t-test

Characteristics		Paired Sample t-test	
		Experiment Group N : 58	Control Group N : 58
		Sig. (2-Tailed)	Sig. (2-Tailed)
Skills	Pre-Test	.000	.000
	Post-Test	.000	.000

Source : *Primary Data*, 2024

Based on the Sig. (2-Tailed) value, it can be interpreted that there is a significant relationship regarding the effectiveness of Assemblr Edu Augmented Reality in improving the skills of parenteral medication among nursing students at Yogyakarta Nursing College, Indonesia.

DISCUSSION

Assembler Edu is a software or learning resource designed to support the process of learning and developing programming skills in assembly language. Typically, Assembler Edu is created with a user-friendly and easy-to-understand interface, focusing on teaching the basic concepts of assembly and the principles of low-level programming. Its main goal is to help students or software developers grasp and master fundamental concepts of low-level programming, which are essential foundations for understanding computer architecture and efficient software development (Inayatur, 2023).

Assembler Edu itself is widely used in the field of education to achieve the goal of effectively delivering learning information to students.Assembler Edu is a version of an assembler tailored for educational use. It usually comes with simplified features and a user-friendly interface to help students better grasp assembly language and low-level programming. Essentially, Assembler Edu refers to an assembler designed for teaching or learning purposes. An assembler is a software program that converts assembly language code into machine code that the computer can interpret (Chen, Y., & Wang, 2018).

Assembler Edu, in particular, may offer educational enhancements like simplified functionalities or a more intuitive interface to support the learning process. This tool can assist students in mastering fundamental concepts of low-level programming, such as writing assembly code and understanding how these instructions are processed by the computer. Features of Assembler Edu might include visual step-by-step code execution, simplified syntax, or other aids to make complex concepts more accessible (Chen, Y., & Wang, 2018).

Research has found that using Assembler Edu as a learning medium is highly effective in providing nursing students with skills and knowledge. This method engages students with realistic experiences and sensations, making it easier for the brain to absorb the information (Nawangsari et al., 2023). The results of the research conducted on students from three nursing schools in Yogyakarta conclude that there is a significant difference in the intervention of Assembler Edu between the two groups. The researchers theorize that implementing the learning method using Assembler Edu can enhance skills and knowledge related to specific information or specialized skills.The researcher has also summarized the development of Assembler Edu's usage in the learning process of nursing students over the past five years.

The development of augmented reality through Assembler Edu has been implemented by several educators. A study by (Lissa'adah and Widiyatmoko, 2023), explored the use of Assembler Edu to enhance students' learning interest and outcomes. This research employed a nonequivalent control group design with simple random sampling. The findings suggest that augmented reality media based on Assembler Edu can improve students' interest and performance in learning about the human excretory system.

This research has significant implications for the development of learning media for nursing students, particularly in relation to nursing procedures. With the continuous advancement of technology, there are many ways that can be applied to support the learning process for nursing students. One such method is Assembler Edu, which has been widely used both domestically and internationally.

The results obtained from the implementation of learning media with Assembler Edu have proven to have a positive impact on the knowledge and skills of nursing students in performing nursing procedures. The researcher holds a similar perspective to various previous studies, asserting that to enhance knowledge and competent skills, modern learning approaches that align with real-world practices must be employed. Therefore, Assembler Edu is a very suitable and

optimal choice.
The researcher is highly confident that the impact of this research will provide positive feedback for the academic world, supported by the results obtained. Additionally, there are several other points that make this research highly relevant and applicable to academic learning. For instance, this study provides concrete evidence that by implementing the modern learning method Assembler Edu on nursing students in two groups, there is a clear difference in that the intervention group shows better knowledge and skills compared to the control group.
This research serves as proof of the application of the Assembler Edu learning method based on Augmented Reality in relation to nursing procedures, with very satisfactory results. Therefore, the researcher strongly supports further studies with a wider variety of procedures, not only for students but also for learners at any educational level. With the implementation of the Assembler Edu learning method, which has been proven and demonstrated to be effective in teaching and learning activities, the researcher is confident that applying this method will be able to enhance the intelligence of students both domestically and internationally.

CONCLUSIONS

There was a difference in the pre-post test scores related to skills in subcutaneous medication between the control and intervention groups. The difference in post-test scores after the Assembler Edu intervention for administering sub cutaneous medication between the control group and the experimental group indicates that the Assembler Edu platform is quite effective in enhancing the skills of nursing students.

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Conflict of Interest

There were not conflict of interest in this research.

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