The Effectiveness of Video Learning Media on Clinical Laboratory Tools: A Comparative Study and Impact on Slow Learners

Fera Sartika[1]*, Nurul Qamariah[2], Chandra Anugrah Putra[3]
[1,2]Universitas Muhammadiyah Palangkaraya, indonesia
*Corresponding Author: ferasartika@umpr.ac.id

ABSTRACT

Students with disabilities in higher education frequently encounter various challenges in accessing learning materials. Students with special conditions, particularly slow learners, often experience difficulties in effectively processing and comprehending complex learning materials. This study aims to examine the effectiveness of educational videos about laboratory equipment for slow learner students. The research involved 59 students from the same cohort, divided into two classes: Class A as the treatment group and Class B as the control group. The study employed a mixed-method approach, combining qualitative and quantitative methodologies. Data collection was conducted through multiple channels: classroom observations, student interviews, GPA screening, and IQ tests to identify slow learner students. Pre-tests and post-tests were administered to assess learning outcomes following the implementation of animated or multimedia-based educational videos, with results analyzed through statistical testing. The findings demonstrated the effectiveness of educational videos in enhancing student learning outcomes.The research methodology incorporated both experimental and observational elements, with careful attention to participant selection and assessment protocols. The use of a control group (Class B) provided a comparative basis for evaluating the intervention's effectiveness, while the mixed-method approach allowed for both quantitative measurement of learning outcomes and qualitative understanding of student experiences. Statistical analysis of pre-test and post-test results offered empirical evidence for the intervention's impact on student learning performance.

Keywords: Effectiveness, Educational Videos, Slow Learners

Citation (APA Style)

INTRODUCTION

Students with disabilities in higher education often face various challenges in accessing learning materials. One significant challenge is the lack of supportive learning media that is easily understandable and interactive (Tannenbaum, R., & Stern, D, 2017). In higher education, particularly in health fields, students are expected to have a deep understanding of clinical laboratory tools, which are integral to their practical learning. However, students with special conditions, such as slow learners, often struggle to process and understand complex learning materials effectively. This condition can affect their ability to operate clinical laboratory tools, which require both technical skills and deep theoretical understanding (Ainscow, M., & Sandill, A., 2010).

One increasingly popular solution to enhance learning effectiveness is the use of video learning media. Video media offers advantages such as clear visualization, step-by-step demonstrations, and higher engagement compared to conventional methods like textbooks or lectures. Previous research has shown that the use of video in education can enhance material

understanding and provide opportunities for students to learn at their own pace (Mayer, R. E., 2005). However, despite the proven effectiveness of video media in many educational fields, its effectiveness in the context of clinical laboratory tool learning for slow learners, particularly in the Health Analyst program at Universitas Muhammadiyah Palangkaraya, has received little attention. Health Analyst students classified as slow learners often face difficulties in following practical laboratory materials. Therefore, this study aims to analyze the effectiveness of video learning media in teaching the use of clinical laboratory tools and its impact on slow learners. A comparative study will be conducted to compare learning outcomes between students using video media and those using traditional learning methods (Sari, D. R., & Sari, R., 2019). This research will also explore how the use of video media can help slow learners overcome challenges in understanding complex materials and accelerate their learning process. It is hoped that the findings from this study can provide new insights into optimizing learning for students with special needs in higher education.

METHOD

This study involved 59 students. Data were collected through classroom observations and interviews with students. Classroom observations and interviews were conducted to gain an in-depth understanding of multimedia technology usage and its impact on learning. Initially, a selection process was carried out for students suspected of being slow learners among all students (semester 3 & 5) by examining their academic performance through GPA (Grade Point Average) scores; seven students with low GPAs were screened. To ensure they were indeed slow learners, an IQ test was conducted with the help of a psychologist. As a result, two fifth-semester students were detected as slow learners. The developed learning innovation was a video teaching tool for clinical laboratory equipment. Before the video was provided to all fifth-semester students including those who were slow learners, it was first tested on third-semester students. The feedback from these students was very positive; on average they commented that the animated video learning method was easy to understand and remember. After the trial phase, a pre-test was conducted first on slow learner students and their cohort to measure their understanding of laboratory tools. Subsequently, teaching materials in the form of PowerPoint presentations and textbooks were provided. The following day a post-test was conducted where students were asked to practice using the laboratory tools directly. Before conducting the post-test, students were divided into two classes: Class A consisted of slow learner students who received teaching materials (PowerPoint presentations, textbooks, and video learning), while Class B received teaching materials (PowerPoint presentations and textbooks).

FINDINGS AND DISCUSSION (BOLD, TNR 12)

Findings

Statistical analysis indicated that after implementing video learning, participants experienced substantial improvements in their understanding or skills. The results from pre-test and post-test analyses are as follows:

Table 1: Pretest-Posttest Results Class A

Paired Samples Test

		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	pretestA - postestA	-46.56214	7.89528	1.49207	-49.62361	-43.50067	-31.206	27	.000

The significance value from the pre-test and post-test test is $0.00 < 0.05$ with t = -31.206 (n = 28).

In this test result, the significance value (p-value) obtained is 0.00. This indicates a very significant relationship between the use of video learning and improved student understanding. Generally speaking, if p-value is less than 0.05, it indicates that using video learning positively affects student learning outcomes.

The t-value obtained is -31.206 with n = 28. This large absolute t-value indicates a significant difference between pre-test and post-test scores; thus the negative t-value indicates that the average post-test score is higher than the average pre-test score. This indicates that after implementing video learning, participants experienced substantial improvements in their understanding or skills.

Table 2: Pretest-Posttest Results Class B

Paired Samples Test

		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	pretestB - postestB	-48.93839	6.85126	1.23052	-51.45145	-46.42533	-39.770	30	.000

The significance value from the pre-test and post-test test is 0.00 < 0.05 with t = -39.77 (n = 31).

The significance value obtained is 0.00. In the hypothesis testing context, this value indicates the significance level of the difference between pre-tests and post-tests. If this significance value is less than 0.05 ($\alpha = 0.05$), then the null hypothesis (H0) stating that there is no significant difference between two groups or two conditions being compared can be rejected. In this case, since the significance value is 0.00 < 0.05 (P < α), it can be concluded that there is a significant difference between pre-test and post-test results after receiving video learning instruction from participants.

The t-value obtained is -39.77 with n = 31; this t-value results from statistical calculations showing how large the average difference between two groups (pre-test and post-test) is in standard deviation units. The negative sign (-) on this t-value indicates that the average post-test score is higher than the average pre-test score; this indicates that video learning has a positive effect on improving student understanding or skills. The large t-value (-39.77) shows that this difference is very significant statistically; larger absolute t-values provide stronger evidence against the null hypothesis. Next, a correlation test between both classes (A and B) regarding pre-test and post-test results yielded:

Table 3: Correlation Test Results for Pre-Test and Post-Test

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	pretestA & postestA	28	.555	.002
Pair 2	pretestB & postestB	31	.225	.225

For Class A: correlation value = 0.555; for Class B: correlation value = 0.225.

- **Class A (0,555)**

  This value indicates a strong positive relationship between pre-test and post-test results; meaning that higher pre-test scores correlate with better post-test scores among Class A students.

- **Class B (0,225)**

  Class B (0.225): Conversely, this correlation value is relatively low; although there remains a positive relationship between pre-tests and post-tests, its strength is weak.This could

suggest other factors may play a larger role in determining Class B's post-test results or that interventions employed were less effective compared to Class A.

Based on analysis above it can be concluded that Class A performed better than Class B due to its higher correlation value (0.555 > 0.225), indicating more successful processes in enhancing student abilities compared to Class B.

Table 4: Average Pre-Test and Post-Test Scores

Nama (Slow-learning students in higher education)	Pretest	Postest
S	39,17	90,42
H	34,58	78,75

Table 5: Percentage Increase from Pre-Test to Post-Test

Nama (Slow-learning students in higher education)	Pretest	Postest	Rate of increase (%)
S	39,17	90,42	130,9%
H	34,58	78,75	127,7%

From analysis above it can be concluded that providing video learning has a positive impact on learning outcomes for slow learner participants; both S and H showed significant score improvements after engaging in video-based instruction. S experienced an increase of approximately 130.9%, while H experienced an increase of approximately 127.7%. This demonstrates that using video-based teaching methods effectively enhances understanding and skills among slow learners.

Discussion

Analysis results show that using animated educational videos positively impacts the learning process; feedback from participants after receiving video instruction indicated that most students felt animated educational videos helped them better understand laboratory tools while enhancing their cognitive abilities—students reported visual learning significantly aided them in revisiting course material.Additionally, assistive technology such as animated videos helps students develop digital skills and information literacy in today's digital era (Damayanti & Nuzuli, 2023).

CONCLUSION

This study demonstrates that using animated educational videos can enhance student learning effectiveness particularly among slow learners; leveraging technology in education enriches student experiences while boosting motivation levels. Furthermore educators should receive training on developing instructional strategies encompassing appropriate technology usage.

ACKNOWLEDGMENT
The innovation of educational media through animated video technology includes audio narration and descriptive text; additionally output produced also consists of teaching materials complete with detailed descriptions related to laboratory tools along with assessments for

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