Mechanical Engineering Education Journal
Vol. 1, No. 4, pp. 114 – 121, 2023

ISSN 2987-7717

Implementation learning media based on fliphtml5 on students' learning outcomes on basic welding

Verenza Delfira, Primawati, Rizky Ema Wulansari, Sri Rizki Putri Primandari

Department of Mechanical Engineering, Faculty of Engineering, Universitas Negeri Padang, **INDONESIA**

*Corresponding Author:
pkhairus@gmail.com

Article history:
Received 11th Sept 2023
Revised 28th Oct 2023
Accepted 13th Nov 2023

https://doi.org/10.24036/meej.v1i4.49

Abstract

FlipHTML5-based e-modules are a form of presenting material using smartphone technology and the internet that can be used as an independent learning resource with a practical and easy-to-operate display. This study aims to analyze the effect of the implementation of FlipHTML5-based learning media on student learning outcomes in the Basic Welding Techniques subject at SMK Negeri 1 Guguk. The research method used in this research is an experimental method The study employed a pre-test post-test control group design, with the research sample consisting of two randomly chosen classes., namely the experimental class using FlipHTML5 media and the control class using conventional learning methods. Data were collected through learning outcome tests conducted before and after treatment. The results showed that there was a significant increase of 28% in student learning outcomes in the class using FlipHTML5 media compared to the control class. Based on the results of the study, it can be concluded that the implementation of FlipHTML5-based learning media is effective in improving student learning outcomes in basic welding engineering subjects.

Keywords : Learning Media, FlipHTML5, Learning Outcomes, Welding Engineering, Vocational Students

Introduction

Education is a process that is consciously carried out in achieving a goal. The meaning of the goal is to try to provide an expression of the expected results obtained by students after experiencing learning (Lail 2023). The world of education continues to transform rapidly, driven by. With the advancement of technology, science and technology continue to develop ... Educators are required to be creative in planning interesting teaching activities. Learning media is used to make involvement in the learning process more unique and collaborative, so that students can make it a motivation to study harder (Nurrita, 2018). As one way for teachers to provide messages and information to students, namely by presenting new learning media. Good learning media can make an attraction for students in class learning activities (Mohamad Eko et. al., 2023). The utilization of technology has given birth to e-modules, an innovation in the world of education that allows access to learning at any time and place. . Electronic Modules provide high learning flexibility for students. (Gani., 2016).

Vocational High Schools (SMK) not only provide students with technical knowledge and expertise, but also form skills that are ready to be applied in the world of work, and also develop student characters such as discipline, responsibility, and high work ethic. The resulting output is to create graduates who are not only competent but also have the main morals they apply. SMK Negeri 1 Guguk is an educational institution that focuses on developing students' skills. Through the Welding Engineering expertise program, students are equipped with the knowledge and skills needed in the industry. The Welding Engineering Fundamentals subject is the basis for students

 ISSN 2987-7717

to understand the welding process. To be declared competent, students must achieve a minimum score of 65 in this subject. The following is a list of students' final grades,

Table 1. Student learning outcomes

Class	n students	>65		<65	
		amount	%	amount	%
TPFL 1	36	21	57.5 %	15	42.5 %
TPFL 2	36	14	51.5%	22	48.5 %
mean		64.78		61.66	

During the PPL at SMK Negeri 1 Guguk, the author observed that teachers tend to provide more teaching materials orally by not actively involving students in learning activities. As a result, students are more passive listeners and less involved in the learning process (Jasmin et al., 2022). The absence of textbooks greatly hinders students' understanding of the Basics of Welding Engineering material. As a result, students have difficulty understanding basic welding concepts properly. Adequate internet access should be utilized to improve the effectiveness of theoretical learning. Ideal learning is learning that places students as active subjects in building their own knowledge. (Permendiknas No.22, 2006). To answer these challenges, the author proposes the application of electronic modules as a more modern learning media. We have adopted an electronic module with an interactive display, like a digital book, which is made using FlipHTML5 (Aprilutfi et.al. 2022). With the FlipHTML5-based module, students can access the subject matter through their smart devices. This adaptability wants students to be able to learn at their own pace and learning model. (Nugroho et al., 2022). Several studies, such as those conducted by Umami (2021) and Rusli (2019), have proven that FlipHTML5-based e-books expect great effects to improve the quality and quantity of the classroom learning process.

Methods

Type of Research

Riset dilaksanakan dengan menerapkan metode eksperimen semu, dengan maksud untuk membandingakan hasil belajar siswa yanag memakai media pembelajaran berbasis FlipHTML5 dengan kelompok kontrol.

Research Procedure

Desain Nonequivalent Control Group digunakan pada riset ini untuk membandingkan efektivitas media pembelajaran berbasis FlipHTML5 terhadap kelompok yang tidak mendapatkan perlakuan tersebut.

Table 2. Experimental Research Design

O_1	X	O_2
O_3		O_4

 ISSN 2987-7717

Research Variables
An element or factor that can be measured, controlled, or observed in a study to determine its effect on other variables. There are several types of variables in research (Hikmah,.2020). The independent variable is the use of FlipHTML5-based learning media. Student learning outcomes are the dependent variable.

Research Population and Sample
Population in this study were X TPFL class students of SMK Negeri 1 guguk with a total of 55 people with details of 27 people in the control class and 28 people in the experimental class. so that the samples used in this study were 28 students in the experimental class.

Data Collection Techniques and Research Instruments
Data Analysis
Data analysis is one of the research processes carried out after all the data needed to solve the problems studied have been obtained completely (Muhson 2006).

Normality Test
The test used with the intention of seeing whether the research data that has been collected is normally distributed or not is called the normality test. The Chi Square test is applied to test the level of normality of the data. If the Chi-Square test value $\leq$ table value or significance value $\geq$ 0.05, then the data is said to be normal.

Homogeneity Test
The criteria for homogeneity testing states that if the Levene test value is smaller or equal to the table value, or if the significance value is greater or equal to 0.05, it can be concluded that the population in the group is homogeneous or has similar characteristics.

Hypothesis Test

Significant differences between the post-test results of the experimental class and the control class were found using the t-test. Student scores after the initial trial were used to see how far students understood the material taught. The minimum score that must be achieved is 65.
There are rules for calculating the percentage of students who are complete, as stated in the Depdiknas guidelines in 2004. Paraphrasing option 3 (more focus on the formula): After students take the initial test, their scores will be used to assess their understanding of the material. The minimum score that must be achieved is 65. Depdiknas (2004) has set a specific formula to calculate the percentage of students who achieve this score.

Individual Completeness

NI=ST/n x100%

Classical Completeness

NI=ST/n x100%

Research Success Indicators
This research is said to be successful if student learning outcomes obtain classical completeness $\geq$ 80% with KKM 65.

 ISSN 2987-7717

Finding and Discussion

Finding

Pre-experiment stage (pre-test)

Table 3. Highest pre-test score

pre-test kontrol	*pre-test* eksperimen
63	67

Differences in the highest and lowest pre-test scores were found between the experimental and control classes, with a higher percentage of success (22%) in the experimental class compared to the control class (19%). From the results obtained, we can see that the experimental class scored higher than the control class.

Analysis and reflection
From the learning outcomes that were determined in the control class in the complete category, namely 14 students and 13 students from the unfinished category. Meanwhile, in the experimental class with a complete category of 19 students and an unfinished category of 9 students. The percentage of the classification value still does not reach 80%, so an evaluation will still be carried out on the next test.

Post-experiment stage (post-test)
After the treatment is given to the experimental group, a measurement is taken again (post-test) to evaluate the effect of the treatment on the measured variable.

Table 4. Highest p-test score

***post-test* kontrol**	***post-test* eksperimen**
78	86

After the final test, students who studied with FlipHTML5 media (experimental class) got an average score of 86, while students in the regular class (control class) only got an average score of 78. Students who used FlipHTML5 experienced an increase in scores of 28%, more significant than the control class students who only increased by 24%. These results show that the use of FlipHTML5 media really helps students in understanding the subject matter.Closing and Evaluation Reflect on the students by asking the impression of the learning process with FlipHTML5-based learning media that has been implementedClosing and Evaluation. Furthermore, asking the impression of the learning process with FlipHTML5-based learning media that has been implemented is part of the reflection.
The results of the analysis showed that:
The Experimental Class experienced a change of 28% after being given treatment, with an increase in the average pre-test score of 67 increasing to 86.
The Control class showed an insignificant change, a change of 22% with an average pre-test score of 63 increasing to 78 with a percentage.

Data Analysis

Validity Test Results

Based on the research used, the validity test is used with the aim of seeing the results of the questionnaire used to accurately measure the construct to be measured. The validity analysis was carried out by comparing the score of each question item with the total score of the questionnaire.

Based on the r table with a significance level of 5% and a sample size of 28, the critical value of r table is 0.374. If the calculated correlation coefficient of a question item is greater than 0.374, then the question item is considered valid (Ghasemi et al., 2019).

Reliability Test Results
If the alpha coefficient (α) is greater than 0.70, the reliability of an instrument can be said to be good.

Normality Test Results

Table 5. Normality test

Tests of Normality							
		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Kelas	Statistic	df	Sig.	Statistic	df	Sig.
Hasil Belajar	Pretest-Eks	127	28	,200*	,970	28	,576
	Posttest-Eks	136	28	,196	,967	28	,498
	Pretest Kontrol	163	27	,062	,935	27	,091
	Posttest Kontrol	147	27	,140	,962	27	0,419
*. This is a lower bound of the true significance.							
a. Lilliefors Significance Correction							

From the normality test output, it can be obtained that the Sig value in all classes > 0.05 and it is said that the data is normally distributed.

Homogeneity test
The homogeneity test is used to ensure that the variance between groups being compared is the same (homogeneous). Decision making.

 ISSN 2987-7717

Table 6. Homogeneity test

Test of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
Hasil belajar	*Based on Mean*	245	1	53	,622
	Based on Median	587	1	53	,447
	Based on Median and with adjusted df	587	1	52,7	,447
	Based on trimmed mean	216	1	53	,644

From the table above, it can be seen that the output of the homogeneity test is the sig value Based on Mean> 0.05, namely 0.622> 0.05 so it can be concluded that the data variants are the same or homogeneous.

Hypothesis Test

Table 7. Hypothesis test

Independent Samples Test

	F	Sig,	t	df	Sig. (2-tailed)
Equal variances assumed,	,254	,622	6370	53	,000

It can be concluded that the hypothesis of this study is accepted, based on the results of the SPSS output which shows a sig value (2-tailed) of 0.000 which is smaller than 0.05.

Discussion

Based on research titled "The application of FlipHTML5-based learning media significantly improves student learning outcomes in basic welding techniques at SMK Negeri 1 Guguk compared to conventional learning methods", the independent sample t test analysis resulted in a value of 0.622> 0.05. The data shows the use of FlipHTML5-based e-modules improves student performance. In line with the research used by Alvin Vikiantika (2021) which shows that Flipbook-based learning media improves students' math learning outcomes at the Driving School and provides valuable input for institutions in formulating policies to support the learning process. Comparison of post-test scores between the experimental and control classes showed a significant increase in the experimental class after treatment, while the control class without treatment did not get a good enough increase. This highlights the effectiveness of the application of learning media in improving student performance.

Conclusion

The conclusions from the results of the research carried out by the researcher are as follows
The Quasi Experiment method by implementing FlipHTML5-based learning media on student learning outcomes in basic welding engineering subjects to students can improve the quality of their learning outcomes. The use of learning media based on FlipHTML5 with the Quasi Experiment method in Basic Welding Engineering subjects has been successfully implemented at SMK Negeri 1 Guguk.

Acknowledgement

Thanks to all the elements that have contributed to the research on the relationship between the completeness of safety facilities and the level of work accidents in the mechanical engineering of SMK Negeri 1 Guguk, thanks to the Department of Mechanical Engineering, Universitas Negeri Padang lecturers, teachers, and staff.

Declaration

Author contribution

Verenza Delfira as a researcher and data collector for the facility relationship. Primawati, S.Si, M.Si. is a provider of direction and methods in research; Dr. Rizky Ema Wulansari, M.Pd.T. Evaluating research methods, Sri Rizki Putri Primandari, M.T., Ph.D.. data analysis and evaluating Background of the Problem.

Funding statement

This research did not receive any specific grants from any funding agency in the public, commercial, or non-profit sectors.

Conflict interest

The author states that there was no conflict when conducting the research.

References

Aprilutfi, D. N. (2022). Flipbook tematik: Alternatif media pembelajaran PKN berbasis fliphtml5 di SD. Educenter: Jurnal Ilmiah Pendidikan, 1(4), 380-385.

Aminah, S. (2018). Rancang Bangun Aplikasi Education Game Pembelajaran Bahasa Inggris Berbasis Multimedia Pada SMP Negeri 8 Pagaralam. Jurnal Ilmiah Betrik: Besemah Teknologi Informasi dan Komputer, 9(01), 1-15.

Bryman, A. (2016). Social Research Methods (5th ed.). Oxford University Press.

Buchari, A. (2018). Peran guru dalam pengelolaan pembelajaran. Jurnal Ilmiah Iqra', 12(2), 106-124.

Creswell, J. W. (2014). Research Design: Qualitative, Quantitative, and Mixed Methods Approaches (4th ed.). SAGE Publications.

Djollong, A. F. (2014). Tehnik pelaksanaan penelitian kuantitatif. Istiqra: Jurnal Pendidikan Dan Pemikiran Islam, 2(1).

Djamarah, Syaiful Bahri, and Aswan, Zain. 2010. Strategi Belajar Mengajar. Jakarta: Rineka Cipta

Fausih, M., dan Danang, T. 2015. Pengembangan Media E-Modul Mata Pelajaran Produktif Pokok Bahasan "Instalasi Jaringan Lan (Local Area Network)" Untuk SiswaKelas XI Jurusan Teknik Komputer Jaringan Di SMK Negeri 1 Labang Bangkalan Madura. Universitas Negeri Surabaya 01 (01):1–9

Fitriani, H. (2015). Upaya Meningkatkan Hasil Belajar Matematika Melalui Model Pembelajaran Kooperatif Tipe Think Pair Share (Tps) Pada Siswa Kelas Viic Smp N 1 Pajangan. Universitas PGRI Yogyakarta.

Gani, A. (2016). Pengaruh Teknologi Informasi terhadap Efisiensi Kerja. Jurnal Teknologi dan Manajemen, 5(2), 123-130.

Ghasemi, A., & Zahediasl, S. (2019). Normality tests for statistical analysis: A guide for non-statisticians. International Journal of Endocrinology and Metabolism, 10(2), 486-489. doi:10.5812/ijem.3505

Gravetter, F. J., & Wallnau, L. B. (2014). Essentials of Statistics for the Behavioral Sciences (8th ed.). Wadsworth.

Hamalik, O. (2017). Proses Belajar Mengajar. Bumi Aksara.

Hamedi, M. R. (2023). Laser Welding in Automotive and Aerospace Industries.

Hikmah, J. (2020). Paradigm. Computer Graphics Forum, 39(1), 672–673. https://doi.org/10.1111/cgf.13898Journal of Laser Applications, 35(2), 022014

Lail, H., Erizon, N., Wulansari, R. E., Mesin, D. T., Teknik, F., Padang, U. N., Tawar, K. A., Intelektual, K., & Belajar, P. (2023). Hubungan Kecerdasan Intelektual Terhadap Prestasi Belajar the Relationship of Intellectual Intelligence To Mechanical. 5(1)

Nugroho, A. P., Syahri, B., Aziz, A., & Rifelino. (2022). Penerapan Media Pembelajaran Berbasis Video Tutorial untuk Meningkatkan Hasil Belajar pada Mata Kuliah Teknik Otomasi Industri Jurusan Teknik Mesin Universitas Negeri Padang. Jurnal Vokasi Mekanika,4(2),59–64 http://vomek.ppj.unp.ac.id/.

Nurrita, T. (2018b). Pengembangan Media Pembelajaran Untuk Meningkatkan Hasil Belajar Siswa. MISYKAT: Jurnal Ilmu-Ilmu Al-Quran, Hadist, Syari'ah Dan Tarbiyah, 3(1), 171. https://doi.org/10.33511/misykat.v3n1.171.

Mohamad Eko W. Ismail, Muhammad Yasser Arafat, & Hendra Uloli. (2023). Pengembangan Media Pembelajaran Interaktif Berbasis Animasi Pada Kelistrikan Bodi Kendaraan. Steam Engineering, 4(2), 114–124. https://doi.org/10.37304/jptm.v4i2.8138

Muhson, A. (2006). Teknik Analisis Kualitatif. Universitas Negeri Yogyakarta, 1–7. Http://Staffnew.Uny.Ac.Id/Upload/132232818/Pendidikan/Analisis+Kuantitatif.Pdf

Suci, N., Putri, R., Syahri, B., Adri, J., Media, A., Mesin, D. T., Teknik, F., Padang, U. N., Pendidikan, D., Sekolah, G., Pendidikan, F. I., Padang, U. N., Tawar, K. A., Proyek, P., & Manufaktur, G. T. (2024). Implementation Of Project-Based Learning In Improving Student Learning. 6(1), 51–56.