Improving Student's Independence and Learning Outcomes Through Website-based Instructional Media

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Abstract: The use of digital learning is a critical component of developing technology information and communication skills. The purpose of this study aims to develop a web-based Petty Cash Management Information System for financial administration courses to increase student autonomy and learning outcomes. This type of research and development employed a modified version of Borg and Gall's Research and Development model. The study's subjects included media and material experts serving as expert validators, six students serving as user validators, and large group test subjects. Quantitative data were gathered through the calculation of scores on validation questionnaires, independence questionnaires, and psychomotor test scores; qualitative data were gathered through interviews, criticisms, and suggestions. The independent sample t-test and descriptive qualitative analysis are used to analyze the data. The validation and trial results indicate that the learning media is appropriate for its designation, learning objectives, and ease of use and that it can be applied to support learning and improve student learning outcomes. The resulting product is unique in that it supports automation, complies with requirements, and features a distinct user interface for lecturers and students.

Keywords: Financial Administration, Instructional Media, Learning Independence

INTRODUCTION

Science and technological advancements have revolutionized the way we learn in the twenty-first century, and the learning process is centered on developing fundamental skills. This era is critical to enhancing an innovative technology-based learning system (Bernhardt, 2015). In addition, digital-based education needs to continue in evolving graduates' ability to acquire 21st century learning skills (Efriyanti & Annas, 2020).

The concept of website-based instructional materials has the potential to influence the process of learning transformation (Baran, 2014; Benedict & Pence, 2012). Changes in instructional tools to digital formats are required to adapt to the needs of today's instructional materials, both in terms of content and learning system (Bernacki, Greene, & Crompton, 2020; Dabbagh & Kitsantas, 2012). According to Januarysman & Ghufron (2016), website-based instructional media is a significant innovation that has altered the learning process. Wiriyanti et al. (2020) describe the effect that website-based learning has on students, particularly regarding that learning becomes more exciting and provides experience with introducing technology as an instructional media and increasing learning motivation, thereby improving the quality of learning. Students are taught to become more proficient in the use of technology. It can be concluded that the

website is an exquisite platform for use, particularly in online learning, because it empowers students to become more self-sufficient in their classroom instruction.

Independent student learning is a crucial component of the learning process; this is because, in addition to being a student, it is time to study independently, which requires creativity and student awareness in the learning process (Ana & Achdiani, 2015; Dabbagh & Kitsantas, 2012; Seufert, 2018; Zheng, 2016). Furthermore, learning outcomes are a critical component of learning (Bernacki et al., 2020; West, 2013). During the Covid-19 pandemic, the implementation of the learning process encountered obstacles and has changed at all educational institutions level. The university level is one of the formal educational institutions. Based on the results of a preliminary study through interviews with lecturers of financial administration courses in the Office Administration Education Undergraduate Study Program, Universitas Negeri Malang, information related to learning activities carried out during online learning was obtained. Students can complete practicum activities online with lecturer explanations and guidance. However, students currently encounter obstacles practicing due to a lack of self-paced instructional media for petty cash management practices.

Some scholars believe that instructional media, digital technology-based instructional media can help students become more motivated to learn (Ihsan, Liza, Setiawan, & Asmaidi, 2019; Li et al., 2020; Xiao & Yang, 2019). Suprianto et al. (2018) also found a significant positive effect of instructional media on student achievement, implying that media use in the learning process clarifies teaching materials, making them more understandable to students. However, what differentiates this study from previous research is the media used and the assessment instruments used. In previous studies, we used instructional media available on the Playstore and those previously developed and widely used by other researchers. The media currently being developed are in the form of new instructional media tailored to the learning outcomes of financial administration courses. They include features for learning materials and practice media in one application. Additionally, researchers conducted evaluations using practicum activities rather than multiple-choice questions, and evaluation instruments were developed using variables and indicators of independence and valid learning outcomes.

Based on the explanation of the importance of instructional media in the teaching and learning process in financial administration courses. The change in the direction of learning from face-to-face and turned into a network and the importance of student learning independence in the era of modern technology-based learning leads the researchers to develop website-based petty cash instructional media in financial administration courses to increase student independence and learning outcomes.

METHODS

This study applied Borg and Gall's research and development (R & D) approach. The Research and Development Method is a type of research in which the primary objective is to develop and modify specific products (Sugiono, 2011). In the first

step, researchers conducted interviews to elicit information about issues and potential problems in financial administration lectures. The second step involved compiling lecture materials in accordance with the Semester Learning Plan (RPS), collecting supporting content for material development, identifying expert validators and initial field trials, and establishing control and experimental classes. In the third step, researchers began developing instructional media.

The fourth step was for the researchers' media to be evaluated for feasibility by the validators, which included one media expert and one material expert. The fifth step was to revise the validated product based on oral and written input and suggestions that are listed on the questionnaire sheet for evaluation by material and media experts. The sixth step involved testing the revised product on three students of the sixth semester. The seventh step was to revise the product that was tested in small groups based on oral and written input from students as documented in the results of the small group test questionnaire. The eighth step involved testing the revised product in a large group setting, with 34 students offering MMM as the experimental class and 34 students offering L as the control class. The final product in this study was one that has passed large group trials (see Figure 1).
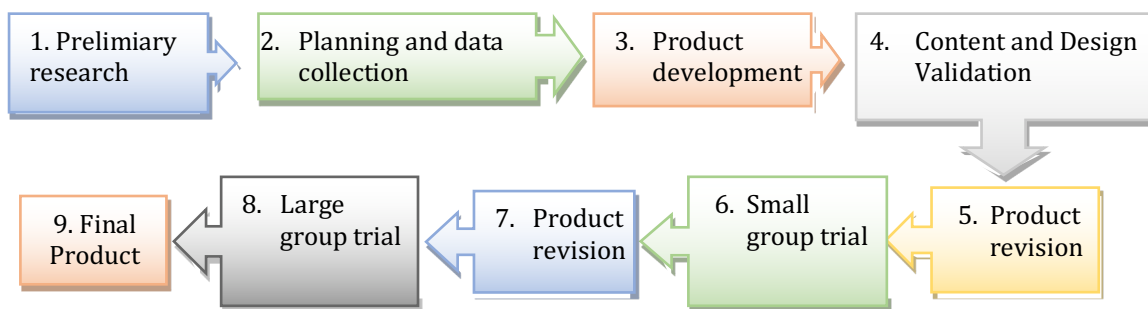

Figure 1. Research Design

The study generated both qualitative and quantitative data, with the qualitative data derived from general opinions, suggestions, and criticisms from material experts, media experts, and six small group trial students. While quantitative data included data from material expert validation, media validation results, small group trials, and data on student learning independence and outcomes, qualitative data included data on learning independence and student learning outcomes. The descriptive percentage method was used to analyze data from the validation of material experts, media experts, small group trials, and learning independence in order to determine the level of feasibility of instructional media and learning independence. Meanwhile, data on student learning outcomes were analyzed using an independent sample t-test to determine whether or not there were differences in student learning outcomes between the experimental and control classes.

RESULTS & DISCUSSION

The product of this research and development is a website-based instructional media called Petty Cash Management Information System in the Financial Administration course with Course Learning Outcomes (CPMK) for practicing petty cash management with applications. This instructional media development project makes use of Firebase services for hosting and storing data. Users can access this application mostly through Google by typing https://simkail.web.app/.

Applications can be accessed via a developed website. This application includes a variety of features, including instructional materials and practical media that include transaction inserts, transaction management, proof of petty cash receipts and disbursements, cashbook reports, recap receipts and expenses, balance data, petty cash fund application forms, account management, and agency settings. Additionally, this application includes a variety of command features, including edit commands for editing saved files, add data commands for creating or entering new data, delete commands for deleting existing data, and print commands for saving files in pdf or print format. Figure 2 illustrates the main display and general operation method.
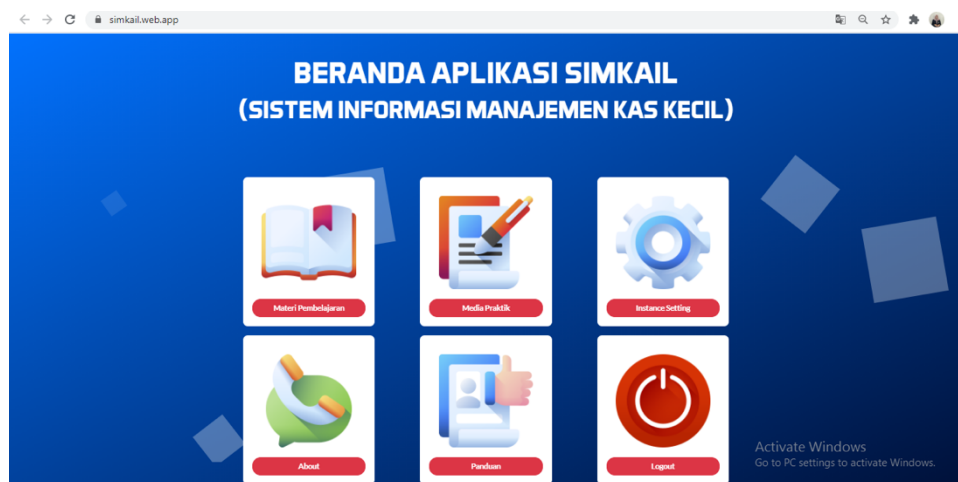

Figure 2. Main Display of The Application

This application serves as an instructional media by utilizing an online database engine to store data that has been added or stored in instructional media, as well as a user-friendly graphical interface to assist users. The application's features enable users to record and search data much faster, as there is a hyperlink function that distributes data from a single data entry to the sections that correspond to the added data; additionally, there is a manual that can be accessed directly within the application.

Using this website-based application to learn media is a form of high-quality and distinctive learning that emphasizes practical activities. The application's appearance and general operation are depicted in Figures 3 to 6. The first stage is for the user to open Google.com and ensure that it is connected to the internet. After typing the https://simkail.web.app/ page into their computer, laptop, or mobile phone, an initial display feature in the form of an option to register as a lecturer or college student will appear.
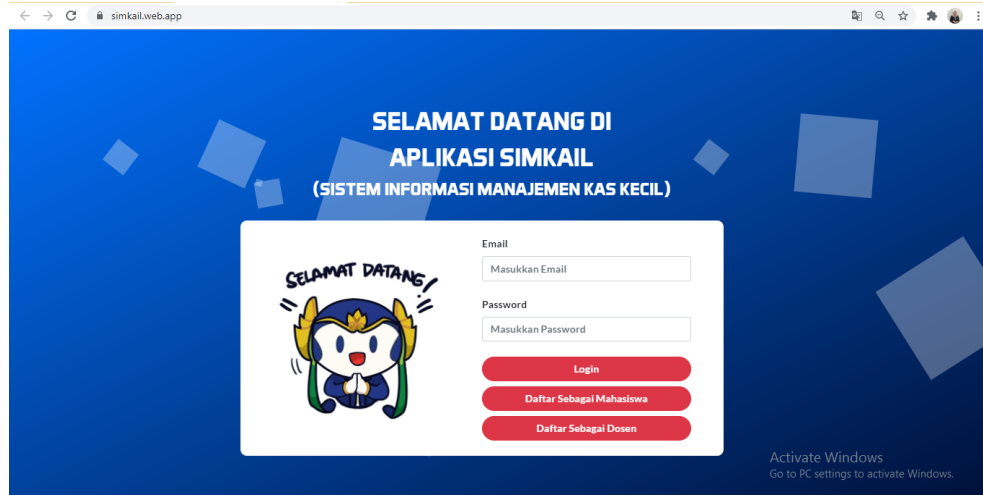
Figure 3. Login Page of The Application

The following feature is "Teaching Materials for Lecturers", which allows lecturers to upload teaching materials in the form of the word, excel, or powerpoint. What distinguishes this feature from that of students is that students are limited to downloading materials; they are not permitted to upload teaching materials. Figure 4 illustrates how Lecturers' teaching materials are presented.
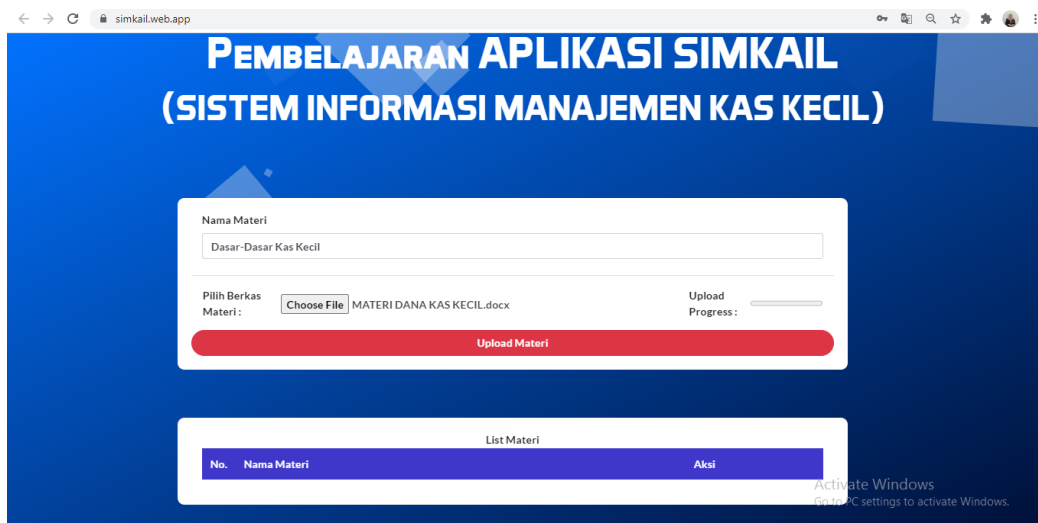

Figure 4. Upload Page for Lecturer's Teaching Materials

The following feature is "practice media for lecturers", which enables lecturers to provide practical simulations and assess student practicum performance. What distinguishes this feature from that of students is that students are only permitted to conduct practicum; they are not permitted to view the outcomes of their colleagues' practicums. Figure 5 illustrates the display of Practice Media for Lecturers.
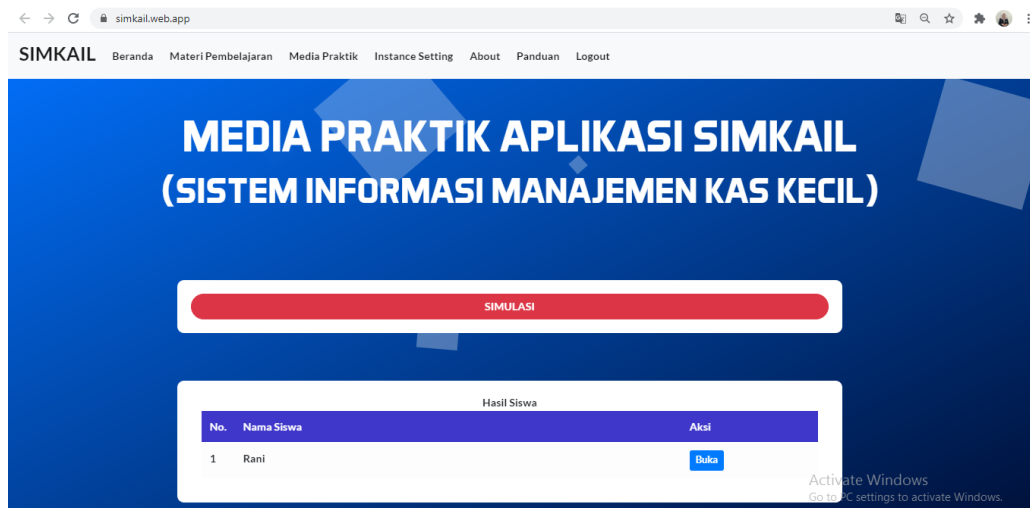
Figure 5. Practice Media Page for Lecturer

The following feature is for lecturers and students to engage in simulation and practice. There are numerous characteristics of petty cash management practices, including the following: 1) Fund submission, a function that allows for the submission of applications for petty cash initial balance funds; 2) Transaction Input is a feature that allows for the entry of petty cash receipts and expenditures; 3) Transaction Management, a database feature for petty cash that allows for the modification of data, the printing of proofs of petty cash income and expenditure, and the deletion of data; 4) Recap of Receipts, is a feature that contains information about petty cash income; 5) Expenditure Recap; is a feature that contains information about petty cash disbursements; 6) Periodic Report, which is a feature that generates reports based on the time and date of a transaction; 7) Per Account Report is a feature that allows for the creation of reports that include all transactions within a single account; 8) Petty Cash Book Report, is a feature that provides detailed information about the bookkeeping activities associated with all transactions entered; 9) Data Balance is a feature that keeps track of the current balance of funds. Figure 6 illustrates the simulation and practice display for lecturers and students.

After applications are programmed, they are validated to determine their suitability as an instructional tool. The feasibility of this material expert-based instructional media is determined by a number of indicators that have been met (Hidayati & Listyani, 2010; Widiyaningtyas & Widiatmoko, 2014). In this study, indicators of achievement include the relevance of practicum media, the completeness of their presentation, as well as the ease with which students can learn the material through practice, and the ability to be student-centered. Then, in terms of validation of instructional media, this application is said to be feasible if it meets indicators for the feasibility of displaying practicum media, ease of access, navigation, and operation, and this practicum media according to the student's level of understanding and ability.
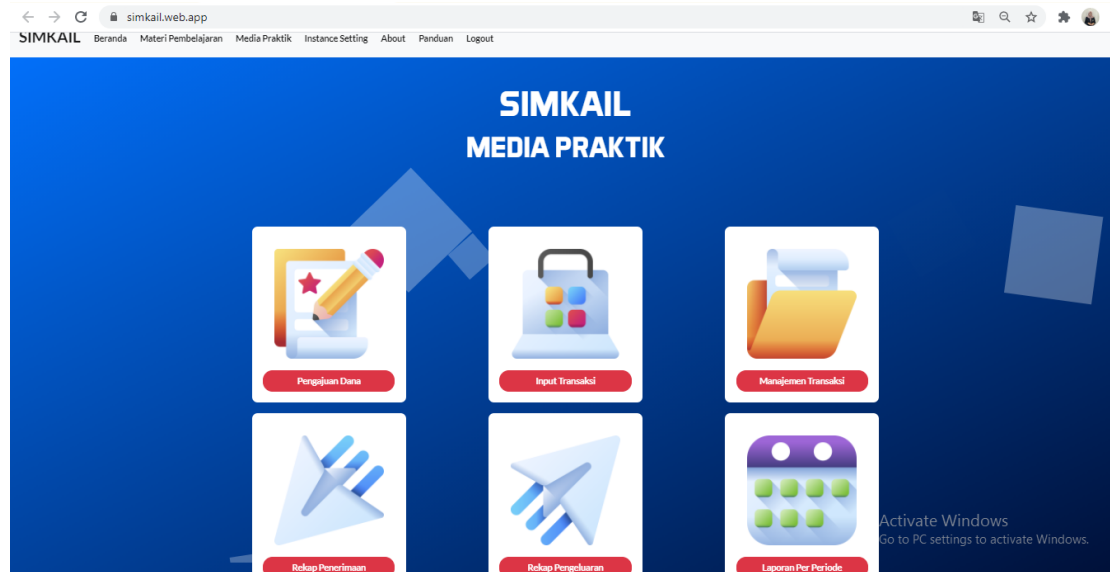
Figure 6. Practice Media for Lecturer and Student

The application validation results were presented in the form of qualitative and quantitative data by material experts, media experts, and small group trial students. According to Widiyaningtyas and Widiatmoko (2014), there are three types of media trials that must be passed during the test or trial stage: (1) individual tests involving material experts and media experts; (2) small group tests; and (3) large group tests. This validation trial is used to assess the quality and viability of the created website-based instructional media results. The following table summarizes the quantitative validation data and small group test subjects.

Table 1. The Results of Media Validation

No	Validation Expert	Percentage	Criteria
1.	Material Experts	83.5%	Feasible
2.	Media Experts	95%	Feasible
	Average	**89.25%**	**Feasible**

According to Table 1, the overall validation percentage average is 89.25 percent, indicating that the researcher's instructional media is deemed "very appropriate" for third-semester office administration education students at Universitas Negeri Malang. This is consistent with Rohdiani and Rakhmawati (2017); Sari and Setiawan (2018); Uno and Ma'ruf (2016) which stated that instructional media is feasible if scores are collected in the appropriate category, and the media's validation assessment is adjusted to the factors considered. In conjunction with website-based application development is extremely valid and feasible to use as a medium of instruction. Additionally, website-based petty cash education media can simplify and expedite data management (Manohar, Dashputra, & Suresh, 2015).

Additionally, the findings of this study demonstrate that the self-regulated learning-based learning model demonstrates an explicit dynamic ability to self-regulate during an effective self-regulation process (Astuti, 2019; Seufert, 2018).

Additionally, the findings of this study indicated that students took an active role in the assessment and appeared to develop into independent learners. Self-study activities aided students in developing a thorough understanding of and ability to comprehend the learning material. This is consistent with the purpose of instructional media, which is to foster a thorough understanding of the material and to boost students' academic performance (Ihsan et al., 2019; Xiao & Yang, 2019).

The assessment of learning outcomes for the experimental and control classes is based on posttests administered to the experimental and control classes, which are then processed in SPSS using the normality and independent sample t tests. The Shapiro-Wilk test was used to determine normality in this study, using SPSS version 25. We conducted a normality test on student learning outcomes based on the experimental and control class' post-test scores. The following table summarizes the results of the post-test normality test.

Table 2. The Comparison of the Average Learning Outcomes of Experiment Class and Control Class

	Class	Shapiro-Wilk		
		Statistic	df	Sig.
Learning Outcomes	1 Control Class	.958	34	.215
	2 Experimental Class	.973	34	.552

According to Table 2, the Shapiro-Wilk normality test indicates that the post-test results for the experimental and control groups have a significance value of 0.215 for the control group and 0.552 for the experimental group, respectively, when the results are greater than 0.05. This value indicates that the post-test test scores are normally distributed. After determining the data's normality, the Independent Sample t-Test was performed. Meanwhile, Table 3 summarizes the results of the independent sample t-test on the student learning outcomes in the control and experimental classes.

Table 3. Independent Sample T-test Results

		Independent Sample t- Test							
		Levene's Test for Equality of Variances		t-test for Equality of Means					
		F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Learning Outcomes	Equal variances assumed	.724	.398	-14.496	66	.000	-9.382	.647	-10.675	-8.090
	Equal variances not assumed			-14.496	65.109	.000	-9.382	.647	-10.675	-8.090

According to the output previously, the value of sig. Levene's Test for Variance Equality is 0.398 > 0.05, indicating that the data variance between the experimental and control classes is homogeneous or equal. Thus, the values contained in the Equal variances assumed table guide the interpretation of the Independent Sample t-Test table output above. According to the Independent Sample t-Test output table in the Equal variances assumed section, the value of sig. (2-tailed) is 0.000 (<0.05), which means that Ho is rejected and Ha is accepted as the basis for decision making in the Independent Sample t-Test. Thus, a significant difference in average student learning outcomes exists between the post-test experimental and control classes.

After correcting the post-test and practice evaluation learning outcomes of each student in the experimental and control classes, it was determined that there is a significant difference in the average learning outcomes between the experimental and control classes. The experimental class's average learning outcomes were higher than the control class's average learning outcomes. The control class's learning outcomes are lower than those of the experimental class because the experimental class's students are more engaged, interested, and motivated to learn when taught using instructional media. Additionally, the use of this instructional media facilitates the experimental class's psychomotor skill training.

This application has several advantages, first, the features in this application meet the requirements and support automation that is adapted to various devices so that users are easy and comfortable using the application as an instructional media. This is consistent with the assertions of Ihsan et al. (2019), Priyambodo, Wiyarsi, & Sari (2012), and Sari & Suswanto (2017) that Web-based instructional media are designed to facilitate independent and group learning processes and to motivate and hone the user's thinking power through the ease and enjoyment of learning and adhere to the digital technology trend. Additionally, student-centered instructional media can address limitations and direct users to information via online instructional media (Dabbagh & Kitsantas, 2012; Santos, Boticario, & Pérez-Marn, 2014; Zhu, 2010).

Second, this application is designed to be highly user friendly as a instructional media, with a responsive design, structured information and consistency, good color contrast, and intuitive navigation. This is consistent with the objective of user interface design, which is to create an effective interface for software systems; a good user interface must integrate user interaction and information presentation (Darussalam, 2015; Hatta, Tianah, & Amroni, 2015). (Pratomo & Irawan, 2015; Pratomo & Irawan, 2015) Additionally, (Benedict & Pence, 2012; Ihsan et al., 2019; Uno & Ma'ruf, 2016) stated that the benefits of website-based learning include having access to a technology-based learning center at any time and from any location. Additionally, this application as a instructional media is said to be of high quality because it is packaged in the form of interconnected instructional media with each of its features and is accessed through the use of technology in the form of laptops, computers, and mobile phones.

CONCLUSION

This research and development resulted in the development of a website-based petty cash instructional media in the form of an application for students enrolled in the financial administration course of the Office Administration Education study program at the Faculty of Economics, Universitas Negeri Malang, as well as the provision of a user manual that is accessible directly from the website. According to material experts and media experts, the trial results of the feasibility of website-based petty cash instructional media in the form of an overall application are perfectly adequate for use as teaching media during the learning process. In terms of the average results of student learning independence in the experimental class, the website-based petty cash instructional media in the form of this application is effective at increasing learning independence when used in financial administration learning activities for students enrolled in the Office Administration Education study program at the Faculty of Economics, Universitas Negeri Malang. Additionally, the use of this application improves learning outcomes when compared to non-application-based learning, as evidenced by the average learning independence and learning outcomes, where the control class receives an average value of student independence that is lower than the experimental class. Thus, it is established that the psychomotor value of the control class is greater than that of the experimental class. It is critical to conduct similar research on a broader subject and with a variety of different research variables in order to determine the validity of similar products. Additionally, learning through the use of the website must be evaluated in relation to other variables.

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