

The Effectiveness of Web-Based Petty Cash Learning Media in Improving Vocational Students' Financial Management Skills

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ABSTRACT

The rapid digital transformation of the workplace requires vocational education to equip students with both financial management competencies and digital literacy. However, many vocational students continue to experience difficulties in mastering petty cash management due to limited opportunities for technology-based practical learning. This study investigates the effectiveness of the SRIKANDI web-based learning application in improving vocational students' petty cash management skills. This study employed an explanatory sequential mixed-methods design combining a quantitative one-group pretest-posttest approach with qualitative SWOT analysis. Participants consisted of 64 Grade XII students enrolled in the Office Management and Business Services (MPLB) program at a vocational high school in Indonesia, selected through cluster random sampling. Quantitative data were analyzed using a paired-sample *t*-test, while qualitative data were collected through semi-structured interviews and analyzed using the SWOT framework. The findings revealed a statistically significant improvement in students' petty cash management skills after using the SRIKANDI application ($p = .017$), with the mean score increasing from 65.97 to 71.72. The qualitative findings indicated that the application's user-friendly interface, interactive transaction features, and flexible accessibility enhanced students' practical learning experiences. Nevertheless, the absence of pre-configured transaction accounts and dependence on stable internet connectivity were identified as implementation challenges. The findings suggest that authentic web-based learning environments effectively support vocational students in developing practical financial management skills while strengthening digital competencies relevant to Industry 4.0. Although the study is limited by its one-group pretest-posttest design and single-school sample, it provides evidence that integrating web-based applications into vocational education can enhance technology-supported learning. Future research should employ experimental designs with larger samples and investigate the long-term effects of digital learning media on vocational competencies.

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1. INTRODUCTION

The demand for workplace skills today is heavily influenced by advancements in science and technology. This is also a consequence of the developments of the Fourth Industrial Revolution, particularly in the office sector, where routine tasks are increasingly being replaced by digital technology (Mishra et al., 2019). Implementing digital technology enhances operational efficiency and transforms traditional work patterns into more flexible and collaborative environments (Tverdushka & Stoliaruk, 2020). This condition impacts how educational institutions must prepare human resources to face the workforce (Lubis et al., 2022). This aligns with the Sustainable Development Goals (SDGs), which emphasize the importance of quality education, particularly SDG 4, where education is expected to provide better access and enhance students' practical skills (UNESCO, 2017). Furthermore, Indonesia's national education goals implicitly aim to create quality, competitive human resources with skills relevant to workplace needs (Suyatmini et al., 2019). Meanwhile, from a business perspective, companies respond strategically by adapting sustainable skills and technology to address challenges (Babashahi, et al. 2024).

In the current era of rapid technological advancement, the integration of information technology into the learning process has become essential, particularly for vocational schools that aim to produce industry-ready graduates. The integration of technology into learning has grown rapidly in recent years, with the aim of increasing student engagement and learning outcomes during the learning process (Martín-Rodríguez & Madrigal-Cerezo, 2025; Sailer et al., 2024). In the Office Management and Business Services (MPLB) program, the traditional manual approach to financial management is no longer sufficient to meet modern workplace demands. Mastery of petty cash management now requires more than just conceptual knowledge; it demands the ability to operate digital systems for accurate and efficient fund tracking (Gerrans et al., 2025). As financial transparency and real-time reporting become standard in organizations, vocational students must transition from paper-based methods to digital-based petty cash management. Therefore, connecting digital literacy directly to this financial competency is crucial to ensure students can manage organizational funds effectively and remain competitive in a technology-driven business environment (Estelami & Estelami, 2024).

The use of digital learning media, not only for entertainment but can also be used as a means of learning and social communication for the development of student literacy (Nwoji et al., 2025; Papadopoulou et al., 2025). Based on a literature review, several issues regarding skills in managing petty cash have been identified. AR et al. (2016) research explains a lack of partnership strategies to enhance graduate competencies. Furthermore, schools must evaluate and analyze the factors causing students' low skills in managing petty cash. Additionally, vocational students often encounter teachers who need more confidence in using ICT. Teachers need to improve their competencies in ICT literacy and deepen their knowledge (Nurhabibah et al., 2018). Lastly, the material for petty cash management skills needs to be better aligned with the needs of the industry (Rejokirono, 2017). Previous researchers have highlighted issues regarding vocational students' skills in mastering the competencies expected upon graduation. Vocational education plays a crucial role in preparing the workforce to meet the demands of the rapidly evolving digital economy (George et al., 2024; Kovalchuk et al., 2022).

A preliminary study conducted at SMK Negeri 1 Salatiga revealed that students faced significant challenges in mastering petty cash management skills. The study observed 64 students from two separate classes to assess their understanding of the competency standards for managing petty cash. Field observations and a review of daily test results indicated a high failure rate, with 32 students representing 50% of the observed group failing to meet the minimum mastery criteria and requiring remediation. This gap in understanding and skill mastery proves that the intended learning objectives have not been achieved optimally. As vocational students are expected to perform these financial tasks in the professional workforce, it is critical to examine the underlying causes of these instructional issues and implement effective media solutions to bridge the competency gap.

Highlight the causes of the low skills of vocational students in the MPLB field in managing petty cash. Schools and teachers often need to pay more attention to Petty cash management skills, particularly when integrating teaching media. The limited skills of teachers in digital media hinder the provision of

actual practice to apply the theories learned by students. Previous research has shown that developing interactive learning media can enhance students' learning interests (Herman & Sutrisno, 2023). Furthermore, the low skills of students in managing petty cash are due to low student motivation, which results in poorly completed assignments (Kurniawan & Istiningrum, 2012). This is indicated by the lack of enthusiasm among students in completing assignments given by teachers and a lack of active participation in discussions.

Moreover, the learning provided focuses on delivering material without offering practice questions to sharpen students' critical thinking. Another cause of the low skills in managing petty cash is the limited availability of modules or teaching materials to deepen knowledge about petty cash management. This aligns with research conducted by Ningsih (2014), which found that using petty cash modules can improve vocational students' learning outcomes. The creativity of modules or teaching materials serves as a learning medium for students to understand concepts that need to be mastered and practised in their studies.

This research urgently needs to support vocational school graduates in preparing themselves for a technology-based workforce. Educators are responsible for equipping students with the skills necessary for future life. Quality human resources are essential to meeting these challenges. Building quality and competent human resources requires innovations in learning to enhance students' understanding and skills (Akbar & Biyanto, 2022).

Therefore, innovation in learning media is needed to improve students' understanding and skills. Web-based learning media offers an attractive solution with better flexibility and accessibility (Ferdiansyah & Irfan, 2021; Novaliendry et al., 2023; Ramalingam et al., 2023). By using this media, students can learn independently and access up-to-date information. Additionally, web-based learning media can present material in more engaging formats, such as videos, simulations, and interactive quizzes, which can help students better understand the concepts of petty cash management.

There is an urgent need to improve the quality of learning by integrating more adaptive and accessible technology. While previous research, such as that by Qomarina et al. (2021), has initiated the development of petty cash management systems, many existing media still rely on offline software or desktop-based applications that limit student access and interactivity. This study introduces SRIKANDI (Self-financing System), a web-based application designed to bridge these gaps. Unlike previous media, SRIKANDI is built for high practicality and cross-platform compatibility, allowing students to access the learning materials anytime and from any device with an internet connection.

The novelty of this study lies in the implementation of an integrated web-based platform that simulates real-time financial reporting, which is often missing in static learning modules. This innovation is critical for vocational education, as it ensures that students are not only learning concepts but are also adapting to the digital workflows required in the modern workforce. In an era where digital skills are a primary requirement for the global job market (WEF, 2023), the use of a flexible and accessible tool like SRIKANDI provides a more realistic and inclusive training environment than traditional, localized software.

This study aims to examine the effectiveness of the SRIKANDI web-based petty cash learning media in improving vocational high school students' petty cash management skills and to analyze its implementation through SWOT analysis. It is hoped that the results of this study can make a positive contribution to enhancing the quality of more innovative and effective learning and improving the quality of education in the field of financial management in vocational schools through technological innovation.

2. METHODS

This study employed an explanatory sequential mixed-methods design, combining a quantitative one-group pretest-posttest design with a qualitative descriptive analysis using the SWOT framework. The participants included 64 students from the XII grade of the Office Management and Business Services (MPLB) program at SMK Negeri 1 Salatiga, selected via cluster random sampling from a total population of two parallel classes due to the relevance of petty cash material to their curriculum. The

procedure began with the implementation of the SRIKANDI learning media, a web-based application featuring transaction input, category management, and report exporting over four sessions, where students engaged in hands-on practice under teacher supervision. The instruments consisted of a performance-based skill test with 10 items, which were expert-validated and tested for reliability, covering indicators of data entry accuracy and financial reporting. Qualitative data were gathered through semi-structured interviews with 6 selected informants for 30 minutes each to derive SWOT categories, subsequently analyzed using the Miles and Huberman model (data reduction, display, and conclusion drawing) with source triangulation to ensure credibility. Finally, for the quantitative analysis, a normality test was performed on the pretest-posttest difference scores as a prerequisite for the paired sample t-test, supplemented by an effect size calculation to measure the magnitude of the media's impact on improving students' practical skills.

3. FINDINGS AND DISCUSSION

3.1 Findings

3.1.1 Effectiveness of Web-Based Petty cash Management Learning Media

The effectiveness of web-based learning media can be assessed using a paired t-test with the same subject samples, in this case, the XII MPLB students at SMK Negeri 1 Salatiga. Data collection is conducted through tests before (pre-test) and after (post-test) the implementation of the learning media. There are two requirements for the paired sample t-test: the data must be interval or ratio, and the data groups must be normally distributed.

Table 1. Tests of Normality

		Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Class	Statistic	df	Sig.	Statistic	df	Sig.
Results	pre-test	.081	64	.200*	.971	64	.142
	post-test	.055	64	.200*	.988	64	.791

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

The significance value in Table 1 of the Kolmogorov-Smirnov test for both datasets is $.200 > .05$, indicating that the data is normally distributed based on the Kolmogorov-Smirnov normality test. The significance values in the Shapiro-Wilk test for both datasets are $.142 > .05$ and $.791 > .05$, indicating that both datasets are normally distributed.

Table 2. Test of Homogeneity of Variance

		Levene Statistic	df1	df2	Sig.
Results	Based on Mean	3.203	1	126	.076
	Based on Median	2.777	1	126	.098
	Based on Median and with adjusted df	2.777	1	119.267	.098
	Based on trimmed mean	3.094	1	126	.081

Based on the Mean, the significance value in Table 2 of the homogeneity test for the pre-test and post-test data is $.076 > .05$. Therefore, it can be concluded from this significance value that the variances of the pre-test and post-test data in the XII MPLB class at SMKN 1 Salatiga are homogeneous.

Table 3. Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair	Pre Test	65.9688	64	16.27148	2.03393
	Post Test	71.7188	64	12.90068	1.61259

In the output of Table 3, a summary of the descriptive statistics results from both samples studied, namely the pre-test and post-test of the effectiveness of web-based learning media for XII MPLB students at SMK Negeri 1 Salatiga, is presented. The pre-test average (mean) is 65.9688, while the post-test average is 71.7188. The total number of respondents or students included as research samples is 64 students from the XII class. The pre-test's standard deviation (std. deviation) is 16.27, while the standard deviation for the post-test is 12.90. Additionally, the standard error mean for the pre-test is 2.033, and for the post-test, it is 1.612.

Since the average pre-test result (65.96) is less than the post-test result (71.71), descriptively, there is a difference in the average test results when using web-based learning media in the XII MPLB class at SMK Negeri 1 Salatiga. Furthermore, to determine whether this difference is significant, the paired samples t-test results shown in the output table of the Paired Samples Test need to be interpreted.

Table 4. Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair	Pre Test - Post Test	-5.75000	18.73457	2.34182	-10.42976	-1.07024	-2.455	63	.017

Research Hypothesis Formulation

H₀: There is no difference in the average results between the pre-test and post-test variables.

H_a: There is a difference in the average results between the pre-test and post-test variables.

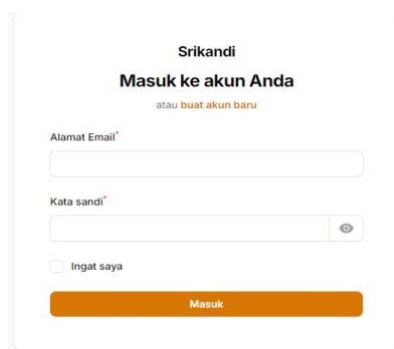
According to Santoso (2014), decision-making in the paired sample t-test is based on the significance value from the SPSS output as follows: If the Sig. (2-tailed) value < .05, then H₀ is rejected, and H_a is accepted. Conversely, if the Sig. (2-tailed) value > .05, then H₀ is accepted, and H_a is rejected. Based on the Paired Samples Test output table above, the Sig. (2-tailed) value is .017 < .05, so H₀ is rejected and H_a is accepted. Therefore, there is a difference in the average results between the pre-test variable and the post-test variable.

The Paired Samples Test output table provides information on the Mean Paired Differences value of -5.75000. This value indicates a difference between the average results of the pre-test and post-test variables (65.9688 - 71.7188 = -5.75000), and this Difference can be seen in the range of -10.42976 to -1.07024 (95% Confidence Interval of the Difference Lower and Upper). The-based petty cash management learning media effectively improves students' skills in managing petty cash in vocational schools. This is in line with the opinion of Qomarina et al. (2021) that developing a petty cash management system as a learning medium can enhance students' competence in managing petty cash.

3.1.2 SWOT Analysis

An analysis using the SWOT analysis framework (Strengths, Weaknesses, Opportunities, Threats) is conducted to deepen the study of the effectiveness of the web-based petty cash management learning media. The results are then compiled into a table to facilitate understanding. Before analyzing this application in more depth, it is advisable to introduce the features available in this application. The application used as a learning medium is called SRIKANDI (Independent Financial System), designed to help students understand and master skills related to the web-based petty cash management system. In the SRIKANDI application, several features can support students' learning to master the petty cash management system, including:

a. Log in view



The login screen is titled "Srikandi" and "Masuk ke akun Anda" (Log in to your account). It includes a link "atau buat akun baru" (or create a new account). The form has two input fields: "Alamat Email" (Email Address) and "Kata sandi" (Password). There is a checkbox for "Ingat saya" (Remember me) and a blue "Masuk" (Log in) button.

Figure 1. Login Screen in the SRIKANDI System

This initial menu is the window you use when logging into the application. This menu also functions to register an account if you do not have one. It includes fields for the password and the registered email address. To register an account, you must provide your name, email address, password, and password confirmation.

b. Dashboard View

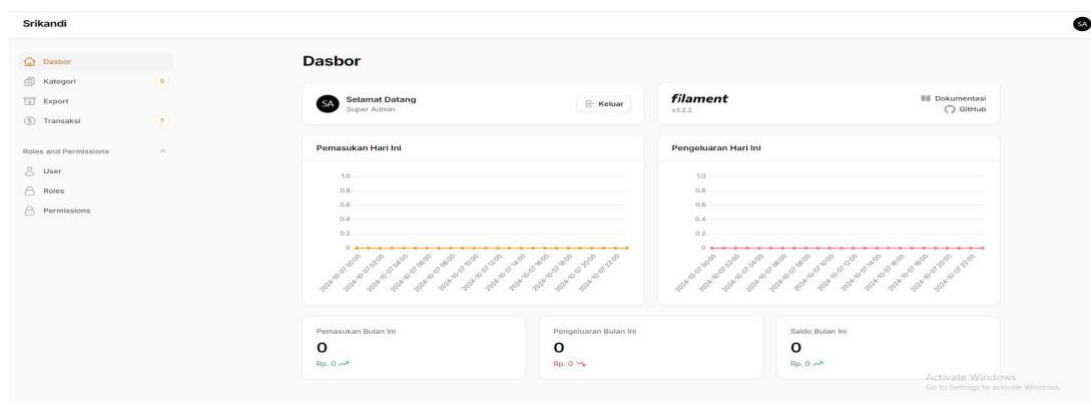
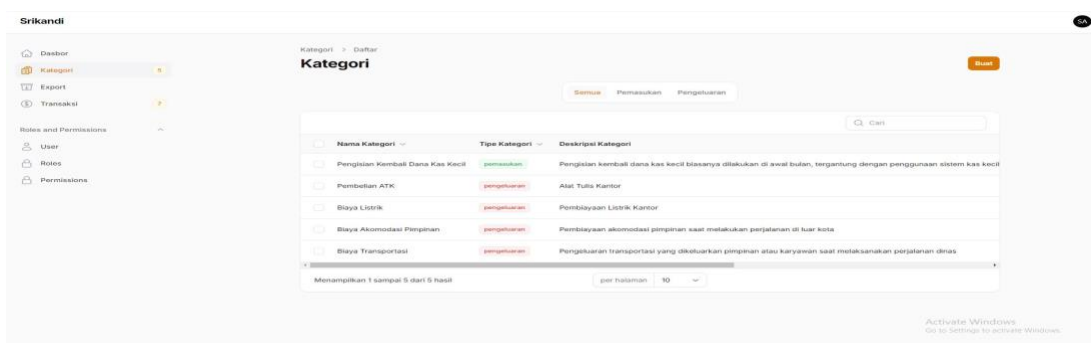


Figure 2. Dashboard Display in the SRIKANDI System

This application's dashboard displays data on income, expenses, and balance. It also includes graphs that show financial progress, and the main menu displays options such as Categories, Export, and Transactions.

c. Transaction Category Features



The transaction category feature is titled "Kategori" and "Daftar" (List). It includes a sidebar menu with options: Dashboard, Kategori, Export, Transaksi, Roles and Permissions, User, Roles, and Permissions. The main content area shows a table of transaction categories. The table has columns: "Nama Kategori" (Category Name), "Type Kategori" (Category Type), and "Deskripsi Kategori" (Category Description). The table lists four categories: "Pengisian Kembali Dana Kas Kecil" (Replenishment of Small Cash Fund), "Pembelian ATK" (Purchase of Office Supplies), "Biaya Listrik" (Electricity Cost), and "Biaya Akomodasi Penginapan" (Accommodation Cost). The table also includes a "Tambah" (Add) button and a "Cari" (Search) input field.

Nama Kategori	Type Kategori	Deskripsi Kategori
Pengisian Kembali Dana Kas Kecil	pemasukan	Pengisian kembali dana kas kecil biasanya dilakukan di awal bulan, tergantung dengan penggunaan sistem kas kecil
Pembelian ATK	pengeluaran	Alat Tulis Kantor
Biaya Listrik	pengeluaran	Pembayaran Listrik Kantor
Biaya Akomodasi Penginapan	pengeluaran	Pembayaran akomodasi penginapan saat melakukan perjalanan di luar kota
Biaya Transportasi	pengeluaran	Pengeluaran transportasi yang dikeluarkan penginapan atau karyawan saat melaksanakan perjalanan dinas

Figure 3. Transaction Category Feature in the SRIKANDI System

This feature is used to classify transactions into income or expenses. In this feature, there is also an additional button to add transactions, which allows users to change the category type and description according to the office's needs.

d. Transaction Input Feature

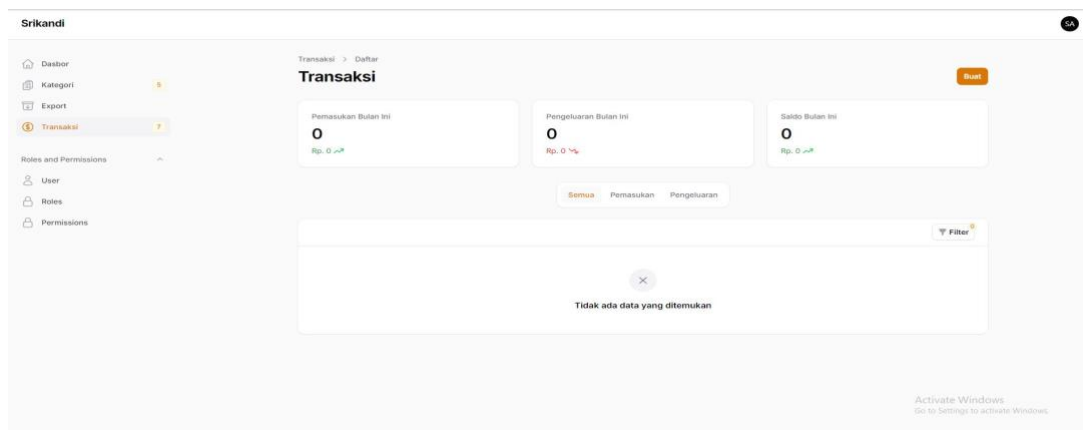


Figure 4. Transaction Feature Display in the SRIKANDI System

The transaction feature records income and expenses. In the dashboard display, this feature is tailored to the needs of petty cash recording by allowing detailed input steps for transactions, from selecting the expense category to adding transaction evidence.

e. Export feature

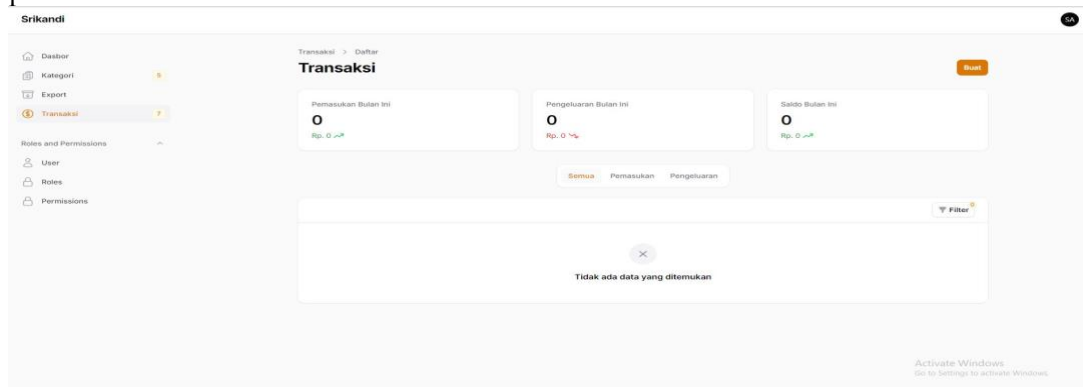


Figure 5. Export Feature Display in the SRIKANDI System

This feature creates petty cash reports as an Excel display that can be accessed or shared as report data.

Interview Results from Respondents:

"Using this application makes it easier for us as students to practice petty cash management because the features available in the application are very helpful to us." SA (06/11/2024)

"The display of this application is quite simple and not too complicated for us to master, and students do not seem to have much difficulty using this application." EH (06/11/2024)

From the strengths of this application, the advantages of features used as web-based learning media can be found, such as the transaction feature and the export feature. These features can be used by school students, especially vocational high school students, to facilitate practice and understanding of financial management, particularly petty cash management. Additionally, another advantage is the simple layout of the SRIKANDI application, which makes it easy for users, especially students and teachers, to use SRIKANDI as a learning medium.

"As a teacher, we find it easier with this application because its use is quite flexible." YS (06/11/2024)

From the opportunities perspective, it can be seen that web-based learning media has the potential to support educational advancement. SRIKANDI is one application that can be used as a web-based learning medium for practicing petty cash systems, which is one of the skills needed in the workforce. Furthermore, since SRIKANDI is a web-based learning medium, students can learn flexibly, whether at school or at home.

"I have to manually enter the transaction name when categorizing the transaction I want to create." CS (06/11/2024)

"When I want to open this application, I encounter issues with the internet connection, so when practicing, buffering often occurs." HK (06/11/2024)

From the weaknesses of this application, it can be noted that the transaction accounts in the SRIKANDI application are not provided by default. The transaction accounts in this application still need to be manually input by users to categorize their transactions. From the threats perspective, the SRIKANDI application requires a stable internet connection and a capable device to run the application.

Table 5. SWOT Analysis of the SRIKANDI Application

	Help	Hinder
From the inside	Strengths: (1) Features that assist students in practising and understanding financial management. (2) A simple layout that makes it easy for users to navigate the application.	Weaknesses: Transaction accounts in the SRIKANDI application are not provided by default.
From outside	Opportunities: (1) A web-based learning medium that can be used for practical training. (2) Flexible learning opportunities that allow students to learn at their own pace.	Threats: It requires a stable internet connection and a capable device to run the application effectively.

3.2 Discussion

The findings of this study demonstrate that the SRIKANDI web-based learning media significantly improved vocational students' petty cash management skills, as evidenced by the statistically significant increase in post-test scores compared with pre-test scores. The improvement indicates that integrating authentic web-based applications into vocational education can facilitate students' acquisition of practical financial competencies. From a pedagogical perspective, this result supports the constructivist view that meaningful learning occurs when students actively engage in authentic tasks rather than merely receiving theoretical explanations (Jonassen, 1999). By allowing students to record transactions, classify accounts, and generate financial reports within a simulated business environment, the SRIKANDI application encourages experiential learning that closely resembles workplace practices. This authentic experience enables students to construct knowledge through direct interaction with realistic financial scenarios, thereby strengthening both conceptual understanding and procedural skills.

The effectiveness of the web-based application is also consistent with the Technology-Enhanced Learning (TEL) framework, which emphasizes that digital technologies improve learning outcomes when they provide interactive, learner-centered, and practice-oriented environments (Sailer et al., 2024). Unlike conventional instruction that often relies on lectures and paper-based exercises, SRIKANDI allows students to perform accounting procedures repeatedly while receiving immediate feedback from the system. Such repeated practice promotes procedural fluency and reinforces students'

confidence in managing petty cash transactions. Previous studies have similarly reported that web-based learning environments increase student engagement, facilitate independent learning, and improve learning performance because learners can access instructional resources anytime and anywhere (Novaliendry et al., 2023; Ramalingam et al., 2021). Therefore, the significant improvement observed in this study may be attributed not only to the digital platform itself but also to the increased opportunities for continuous practice and self-directed learning provided by the application.

The findings further demonstrate that integrating digital financial management applications into vocational education aligns with the current transformation of workplace competencies in the Industry 4.0 era. Modern organizations increasingly rely on computerized accounting systems, digital reporting, and cloud-based financial management platforms, requiring graduates to possess both accounting knowledge and digital literacy (Babashahi et al., 2024). Consequently, vocational education should move beyond teaching manual bookkeeping techniques toward developing technology-oriented competencies that reflect actual industrial practices. The SRIKANDI application represents one example of contextual learning media capable of bridging the gap between classroom instruction and workplace expectations. This finding is consistent with Gerrans et al. (2025), who argued that financial education becomes more effective when learners engage directly with digital financial tools rather than relying solely on theoretical instruction. Similarly, George et al. (2024) emphasized that vocational institutions must integrate Industry 4.0 technologies into classroom learning to prepare graduates for increasingly digital workplaces.

The qualitative findings obtained through the SWOT analysis complement the quantitative results by explaining the factors that contributed to the effectiveness of the learning media. Students perceived the application's simple interface, transaction features, and report-exporting capability as major strengths that facilitated practical learning. Teachers likewise acknowledged the flexibility of the web-based platform, enabling learning activities to continue both inside and outside the classroom. These findings support previous research indicating that usability and accessibility are among the primary determinants of successful educational technology adoption (Ferdiansyah & Irfan, 2021). Learning applications with intuitive interfaces reduce students' cognitive load, allowing them to concentrate on mastering learning objectives rather than understanding complex software operations. Furthermore, the flexibility offered by web-based applications supports self-regulated learning, enabling students to revisit learning materials independently according to their individual learning pace.

Despite these positive findings, the SWOT analysis also identified several limitations that should be considered in future implementation. The absence of default transaction account templates requires students to manually create financial categories before practicing, which may increase cognitive demands, particularly for novice learners. Furthermore, the effectiveness of the application remains dependent on stable internet connectivity and adequate technological infrastructure. These challenges are common barriers to digital learning implementation in vocational education, particularly in schools with limited technological resources (Kovalchuk et al., 2022). Consequently, successful implementation requires institutional support, including reliable internet access, appropriate hardware, and continuous professional development for teachers. Without these supporting conditions, the pedagogical advantages of web-based learning media may not be fully realized.

This study contributes both theoretically and practically to vocational education research. Theoretically, it extends the growing body of evidence demonstrating that authentic web-based learning environments enhance vocational competencies by integrating experiential learning with digital technology. Practically, the findings provide guidance for vocational schools seeking to modernize accounting instruction through technology-enhanced learning. Nevertheless, several limitations should be acknowledged. The study employed a one-group pretest-posttest design without a control group, limiting the ability to attribute learning gains exclusively to the intervention. Additionally, the research was conducted in a single vocational school with a relatively small sample size, restricting the generalizability of the findings. Future studies are therefore encouraged to employ quasi-experimental or randomized controlled designs involving multiple schools, larger samples, and

longer intervention periods. Future research may also investigate students' long-term retention of financial competencies and examine how web-based accounting applications influence higher-order skills such as financial decision-making, problem-solving, and digital financial literacy.

4. CONCLUSION

This study demonstrates that the SRIKANDI web-based learning application is effective in improving vocational high school students' petty cash management skills, as evidenced by the significant increase in post-test scores following the learning intervention. Beyond enhancing students' practical competencies, the application provides an authentic and technology-supported learning environment that aligns with the digital skill requirements of contemporary workplaces. The SWOT analysis further revealed that the application's interactive features, user-friendly interface, and flexible accessibility constitute its primary strengths, while the absence of pre-configured transaction accounts and dependence on stable internet connectivity remain important challenges for implementation. Despite these positive findings, the study has several limitations. The use of a one-group pretest-posttest design without a control group limits the ability to establish causal relationships, and the research was conducted in a single vocational school with a relatively small sample, reducing the generalizability of the findings. Future research is therefore recommended to employ quasi-experimental or randomized controlled designs involving larger and more diverse samples across multiple vocational schools. Further studies should also investigate the long-term impact of web-based financial learning applications on students' financial literacy, digital competence, problem-solving ability, and workplace readiness, while exploring additional application features that may further enhance learning effectiveness in vocational education.

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