Journal of Office Administration Education (JPAP)
Journal homepage:https://journal.unesa.ac.id/index.php/jpap

Journal of Office Administration Education (JPAP)
Volume 13, Number 3, 2025
E-ISSN: 23389621

EFFECTIVENESS OF CMS-BASED LEARNING MEDIA ON STUDENT ENGAGEMENT AND LEARNING OUTCOMES IN VOCATIONAL HIGH SCHOOL OFFICE MANAGEMENT PROGRAMS BUSINESS SERVICES

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ARTICLE INFO

Keywords:
Management System, Learning; Engagement, Learning Outcomes

Article History:
Received 17 November 2025
Accepted 24 December 2025
Available online 30 December 2025

https://doi.org/10.26740/jpap.v13n3.p722-732

ABSTRACT

Phenomenon/Issue: The digital transformation in education has underscored the need for innovative learning strategies that enhance student engagement and academic achievement, particularly in vocational high schools (SMKs). However, many existing learning media remain insufficiently interactive and fail to foster active student participation.
Purpose: This study aims to develop a Content Management System (CMS)-based learning media and evaluate its effectiveness in improving student engagement and learning outcomes in the Office Management and Business Services program at SMK.
Novelty: The novelty of this research lies in the implementation of an interactive blog-based CMS tailored specifically for archival studies, integrating instructional videos, quizzes, and comment sections to promote independent exploration and active learning.
Research Methods: The study employed a Research and Development (R&D) method using the ADDIE model and involved 11th-grade students at SMKN 1 Surabaya as research participants. Effectiveness was assessed through expert validation, classroom observations, pre-test and post-test evaluations, and student response questionnaires.
Results: The results indicated that the CMS-based media was rated as highly feasible by expert validators. Empirical findings showed a significant increase in student engagement, demonstrated through active participation in discussions, task completion, and self-directed exploration of materials. Learning outcomes also improved significantly following the use of the CMS-based media.
Research Contributions: This study contributes to the development of practical and effective digital learning media in vocational education and serves as a strategic reference for implementing technology-based instruction in vocational high school contexts.

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INTRODUCTION

The development of digital technology in the 21st century has brought fundamental changes to the educational landscape (Zaini & Nugraha, 2021). In vocational education, which emphasizes both theoretical understanding and practical skills, the integration of technology is becoming increasingly essential to enhance the quality of teaching and learning (Kemendikdasmen, 2021). One of the major challenges faced by vocational high schools (SMKs) is the low level of student engagement and suboptimal learning outcomes, particularly in subjects that require conceptual and procedural comprehension such as archival studies.

Table 1. Distribution of Final Exam Scores for Grade 10 Students of the MPLB Department of SMKN 1 Surabaya

Value Range	Number Of Students	Percentage
0 – 69	25	71,42%
70 – 100	10	28,58%
Total	**35**	**100%**

Source: Research, 2025

Observations at SMKN 1 Surabaya reveal that the majority of students remain passive in class, with limited participation in discussions and independent learning activities. Supporting data show that 71.42% of students scored below the minimum competency standard in archival subjects. This situation is exacerbated by the limited use of interactive learning media. Teachers mostly rely on PowerPoint, e-books, and static learning platforms like Google Classroom, which are less effective in encouraging active involvement and collaborative learning.

To address this issue, Content Management System (CMS)-based learning media offer a promising alternative. CMS platforms allow educators to create, manage, and update digital learning materials dynamically, while also enabling students to access content flexibly as stated Fikar *et al* (2024); Melisa Aho (2013); Andrejevic dan Selwyn (2019). Equipped with features such as videos, interactive quizzes, and comment sections, CMS-based media have the potential to foster greater student autonomy, engagement, and improved learning outcomes.

However, most existing studies focus on CMS usage in higher education or general subjects, with little emphasis on its application in vocational contexts. Therefore, this study aims to develop and evaluate the effectiveness of a CMS-based learning media tailored to archival content in the Office Management and Business Services program at SMK. The objective is to enhance both student engagement and learning performance through the integration of interactive and context-specific digital tools.

LITERATURE REVIEW

Theories of Learning and Instruction

Learning is defined not merely as memorization but as a relatively permanent change in behavior or capability resulting from experience and interaction with the environment Manurung *et al* (2020). Instruction, as stated by Gagné (1985), is a deliberately planned activity to facilitate such learning through the interaction between teachers, students, and learning resources. In the vocational school context, learning must accommodate student diversity in motivation, cognitive ability, and learning style, making student-centered, technology-based instruction essential**.**

E-ISSN: 23389621

Learning Media

Learning media refers to tools or materials used to convey content from educators to students in ways that are more engaging and understandable. In vocational education, media must bridge theoretical concepts and real-world skills. According to Sahib *et al* (2023), the right media can enhance motivation, focus, and comprehension—key components for effective vocational training. Interactive media such as videos, simulations, and web-based platforms allow learners to visualize processes, repeat practices, and explore topics independently, aligning well with competency-based learning approaches (Yunjo, 2021)..

Content Management System

Content Management System (CMS) is a web-based platform used to create, manage, and deliver digital learning content (Baldo & Migliardi, 2023). According to Anggara (2023) and Ramadhanti (2020) In educational settings, CMSs such as WordPress, Moodle, or Blogger enable educators to integrate videos, quizzes, discussion forums, and other learning tools, offering students access to content anytime and anywhere. Previous studies have shown that CMS usage improves accessibility and supports individualized learning paths (Saputro, 2023; Pierce et al., 2022). However, the application of CMS in vocational high schools, particularly for technical subjects like archival studies, remains limited.

Student Engagement and Learning Outcomes

Student engagement involves the emotional, cognitive, and behavioral investment in learning activities. Engaged students are more likely to participate in discussions, complete assignments, and pursue knowledge beyond the classroom (Skulmowski & Xu, 2022). In vocational schools, this engagement is closely linked to learning outcomes, which encompass not only academic performance but also practical skill mastery and attitude development Jean Piaget entitled *The Origins of Intelligence in Children*, 1952 dan Lev Vygotsky berjudul *Mind in Society*, (1973). Digital platforms that encourage self-directed learning, such as CMS, are well-positioned to improve both engagement and learning results.

METHOD

This research employed an educational Research and Development (R&D) design, aimed at producing an instructional product in the form of a CMS-based blog as an interactive learning medium. The product was developed to support student learning in the subject of archival fundamentals within the Office Management and Business Services program at SMKN 1 Surabaya. The development model used in this study followed the ADDIE instructional design model proposed by Dick and Carey (1996), consisting of five sequential phases: Analysis, Design, Development, Implementation, and Evaluation. However, for practical reasons, the implementation in this study was limited to the first four stages, excluding the final evaluation cycle.

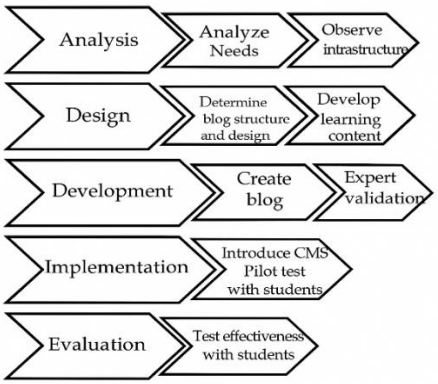

Figure 1. Development Procedure
Source: Processed By Researcher, 2025

E-ISSN: 23389621

Data were obtained using several instruments:

a. Expert validation forms for assessing the quality and feasibility of the developed media by content and media experts.
b. Observation sheets to measure student engagement across classroom and digital activities.
c. Pre-test and post-test instruments to determine the improvement in learning outcomes before and after using the CMS-based media.
d. Student response questionnaires to evaluate student perception and satisfaction regarding the media.

The subjects consisted of Grade XI students from two classes in the Office Management and Business Services department. One class was assigned as the experimental group, which used the developed CMS-based blog media, while the other functioned as the control group, which utilized conventional media (e.g., PowerPoint, e-book, Google Classroom). Quantitative data were analyzed using descriptive statistics and comparative analysis. The effect of the developed media was measured by comparing student engagement levels and mean learning outcomes between the experimental and control groups using pre- and post-test scores. Expert validation data were analyzed descriptively, while student responses were interpreted using Likert-scale criteria.

RESULTS AND DISCUSSION

Development of CMS-Based Learning Media

The media development process in this study followed the ADDIE instructional design model, consisting of five phases: Analysis, Design, Development, Implementation, and Evaluation. However, the process was limited to the implementation stage. Each phase was adapted to suit the specific instructional needs of the archival studies subject within the Office Management and Business Services program.

a. Analysis Phase
The initial stage focused on identifying problems in classroom instruction—primarily the low student engagement and lack of interactive media. A needs analysis was conducted to align the content with the curriculum and student characteristics, especially their preference for flexible, digital tools.
b. Design Phase
In this phase, the structure and layout of the CMS-based blog were planned. The media design prioritized user-friendly navigation, structured content flow, and the integration of materials such as articles, videos, and Wordwall-based interactive quizzes.
c. Development Phase.
The CMS platform was developed using Blogger. Educational materials—including text-based content, embedded videos, downloadable worksheets, and educational games—were uploaded. The developed media underwent validation by content and media experts, and a limited trial was conducted to evaluate usability.
d. Implementation Phase

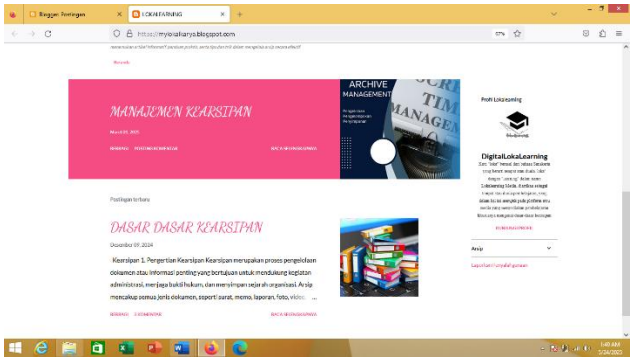

Figure 2. . Final View of CMS LokaLearningMedia
Source: Reseacher Data, 2025

The CMS-based blog was introduced to students through orientation sessions. A total of 63 students participated in the trial. Observations revealed that students were able to navigate and use the features effectively. Minor technical suggestions—such as display scaling for mobile users—were documented for improvement.

e. Evaluation

Table 2. Recapitulation Of Validation Results

Validator	Jumlah Skor	Skor Maksimal	Persentase	Kriteria
Media	30	35	85%	Sangat Layak
Materi	21	25	84%	Sangat Layak
Rerata persentase			84,5	Sangat Layak

Source: Reseacher, 2025

The validation results from subject matter and media experts yielded high feasibility scores—85% from media experts and 84% from content experts, resulting in an average of 84.5%, which classifies the media as “very feasible” for implementation in classroom learning.

Student Perception and Satisfaction

Table 3. 1Of Student Response Results

No.	Statement	Number of YES	Amount No	YES Percentage
1	I understand how to access the CMS media.	63	0	100%
2	The media display is attractive and easy to navigate	62	1	98.5%
3	The material presented in the media is easy to understand	60	3	95.5%
4	I feel more interested in learning to use this CMS media	61	2	97%

No.	Statement	Number of YES	Amount No	YES Percentage
5	I can access media anytime and anywhere	63	0	100%
6	This CMS media helps me understand the basics of archiving material.	63	0	100%
7	There are learning features such as videos/images/quizzes	63	0	100%
8	I feel more independent in learning to use this media	62	1	98.5%
9	I have no difficulty in using this medium	60	3	95.5%
10	Do you want media like this in other learning?	62	1	98.5%
	Average			98.35%

Source: Reseacher, 2025

The student response questionnaire revealed a 98.35% positive rating, indicating high levels of satisfaction regarding the relevance, attractiveness, and ease of use of the media. This supports the conclusion that the CMS-based platform is not only technically feasible but also pedagogically effective in promoting motivation and participation in learning.

Effectiveness on Student Engagement and Outcomes

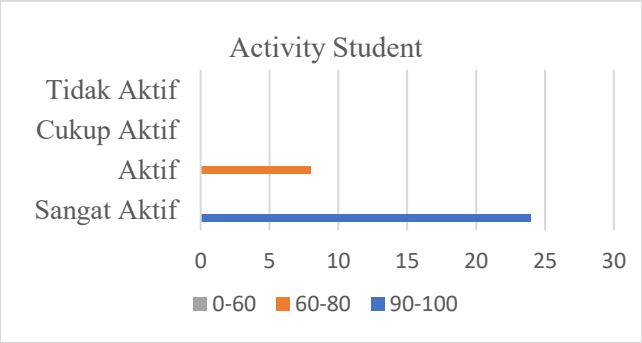

Figure 3. Recapitulation Of Student Activity Observations
Source: Researcher Data (2025)

The CMS media, titled Lokalearning, successfully enhanced student engagement. Observation scores indicated that most students fell under the “active” or “very active” category. Engagement was evidenced by participation in comment discussions, independent content access, and completion of interactive tasks. Regarding academic performance, a paired sample t-test demonstrated a significant improvement in the

E-ISSN: 23389621

experimental group's post-test scores (p-value = 0.000), with a mean gain of negative 14.11 points, significantly higher than the control group's 8.8-point gain.

Table 4. Learning Outcomes of the Experimental Class

No.	Name	Pretest	Post Test	Gain Score
1	Keisya Dafina Valencia	55	95	40
2	Ishmah Millati dwi Setiawan	35	100	65
3	Khansa Novia Wibawati	95	100	5
4	Ghea Dwinov S.I	90	95	5
5	Friza Desi Ratna Fater	95	100	5
6	M.fachri alkautsar	80	95	15
7	Maritza rafa shabrina syandana	95	95	0
8	Jingga Lentera	75	95	20
9	Julia Risa Ambami	45	100	55
10	Keisya Anatasya Rahmadani	95	100	5
11	Faizhal Khansa Ferdia Difa	85	95	10
12	Fatimah azzahra	65	95	30
13	fina islami acinta	70	95	25
14	Kirana Aurel A.	70	95	25
15	Dipa Deakinasih	90	100	10
16	Ervina Nur Aisyah	100	100	0
17	Keyla Farah Aurelia	50	100	50
18	Lenia Citra Agustina	100	100	0
19	Fanesa May Carry	80	95	15
20	Ficholas Wijaya	85	95	10
21	khanza auryne	75	95	20
22	Lenia Citra Agustina	35	100	65
23	Jamaludin Asror	95	100	5
24	Erlita vio ananda	90	100	10
25	Dika Dwi Arianto	100	100	0
26	Dzakiah Rahadatul	85	100	15
27	fahri livi arlenta	85	100	15
28	filia amany ziren	55	95	40
29	mas fadjrul aa	75	95	20
30	Elvira Vegaputri Salsabilla	85	100	15
31	Irfan maulana	30	75	45
32	Kharidah Citra Setyaningtyas	85	100	15
Average		76.6	97.0	20.5

Source: Reasearcher Data, 2025

Based on the trial conducted in the experimental class consisting of 32 students, an improvement in learning outcomes was observed following the use of CMS-based media. The average pretest score of 76.6 increased

to 97.0 in the posttest. The average gain score achieved by students was 20.5 points. The gain score represents the individual improvement in scores. Nearly all students experienced an increase, with some showing progress from low to very high scores. This indicates that students' understanding of the material improved after using the CMS-based learning media. The increase in scores suggests that the use of CMS is effective in enhancing vocational high school students' learning outcomes in the tested subject.

Table 5. Learning Outcomes of the Control Class

No	Name	Pretest	Postest	Gain Score
1	Fajar Prambudi	35	45	10
2	Deniro Vaelska Valentino	45	55	10
3	Basilia Nafi Salasika	65	65	0
4	Atalie Nitan Sabrina	30	35	5
5	Andin Althafunnisa	35	45	10
6	Angelina Moza Setyawardani	40	45	5
7	Anis Arizahlu Elasyuli	45	50	5
8	Anggita Adiah S	65	65	0
9	Andini Omega Putri	75	80	5
10	Ajeng Chichilia Zheliza Cahyono	45	55	10
11	Gusti Ayu Komang Puspa Riyani	45	55	10
12	Azizah Arum S.	40	45	5
13	Clara Ahmi Adinda	45	55	10
14	Desvianti Tri Kurnia Rahayu	45	55	10
15	Berlinda Chelsea Nadyne Mauliddina	50	65	15
16	Anita Rasti Gusfany	75	85	10
17	Afifa Alwiyah	90	100	10
18	Amelia Hana	35	45	10
19	Auleria Decha	45	75	30
20	Ainun Firdaus	30	35	5
21	Agustine Damayanti	35	35	0
22	Annisa Syahda Maheswari N.	40	45	5
23	Ayu Handayani	30	35	5
24	Bunga Cinta Vellyn	45	45	0
25	Natalie Nitan Sabrina	30	65	35
26	Maurel Rachelia	35	45	10
27	Dealova Putri Maharani	25	35	10
28	Ana Riswana	85	85	0
29	Anggun Rosilawati	35	40	5
29	Anandhita Meidinanti	100	100	0
30	Alfatrah Oktaviano	70	100	30
31	Ainun Mardiyah	95	100	5
Average		50.2	58.9	8.8

Source: Reasearcher Data, 2025

Based on the test results in the control class consisting of 31 students, an improvement in learning outcomes was observed from the pretest to the posttest. The average pretest score of 50.2 increased to 58.9 in the posttest, with an average gain score of 8.8 points. However, compared to the experimental class, this improvement is considered relatively low. This indicates that conventional teaching methods or the absence of CMS-based media did not result in a significant improvement in students' learning outcomes.

Based on the evaluation results of the pretest and posttest in both the experimental and control classes, it was found that the use of CMS-based media led to an improvement in students' conceptual understanding and academic achievement. This media facilitated repeated access to learning materials, enhanced information clarity through visualizations, and provided independent practice opportunities through self-paced exercises (Pierce, Sosa, Fredrickson, & Kenon, 2022). And here are the results of the T test

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Lower	95% Confidence Upper			
Pair 1	pretest1 - postest1	-14.11290	15.43161	1.95982	-18.03180	-10.19401	-7.201	61	0.000

Figure 4. T -Test Results
Source: Researcher Data (2025)

These findings reinforce the assertion that CMS-based media can enhance learning effectiveness by offering accessibility, structured repetition, and flexible pacing. This aligns with Muhammad Mujtaba Asad dan Anum Quresi (2025), who noted that CMS enables self-regulated learning. Similarly, Yunus *et al* (2023) emphasized that CMS platforms reduce learning disparities by supporting individualized learning experiences. This improvement in learning outcomes is closely related to the accessibility and time flexibility provided by CMS-based media. Students are no longer confined to classroom learning hours; instead, they can study at home or outside class hours according to their individual needs. According to Muhammad Mujtaba Asad and Anum Quresi (2025). CMS-based learning media enables more personalized learning experiences tailored to each student's learning pace, thereby significantly enhancing learning outcomes. Asad also noted that the use of CMS-based media can minimize learning gaps, as it gives students greater control over their learning process. This type of media is also well-suited for vocational school students who require practical and gradually understandable learning materials because the influence of media is very potential in this era (Haan, 2022). Therefore, CMS-based learning media should not be seen merely as a learning aid, but rather as an effective strategy to improve academic performance, as supported by the findings of Intani et al. (2023). CMS media provides a more meaningful, measurable learning experience that aligns with the needs of today's learners, whose characteristics are evolving with the times (Anggara & Harjanta, 2023).

CONCLUSION

This study concludes that the CMS-based learning media developed for archival instruction in vocational education is both feasible and effective. Expert validation and positive student feedback confirm its quality in terms of content, interface, and usability. The implementation enhanced student engagement and significantly improved learning outcomes, supporting the pedagogical value of CMS platforms in fostering interactive and self-directed learning. Based on these findings, it is recommended that teachers adopt CMS-based media as an alternative instructional tool to support independent learning. Schools should provide infrastructure and training support to ensure successful integration of technology in the classroom. Students are encouraged to actively engage with the platform beyond class hours to reinforce understanding. Future research may expand this work to other subjects or education levels, incorporating variables such as learning motivation or digital literacy. Moreover, ensuring homogeneity in class groupings is advised to optimize the impact of media interventions.

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