ISSN 2085-4579

Exploring Masterweb's Effectiveness in Optimizing Digital Based Learning and Education Management

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Accepted on May 10th, 2024
Approved on June 26th, 2024

***Abstract*— Masterweb is a concept where multiple web services are integrated into a centralized platform, offering seamless access and management of various online tools and resources. Research discusses the effectiveness of masterweb in optimizing digital-based learning and education management. Research method uses a mix method approach with an exploratory design. Paper also highlights the importance of transforming learning media in the digital era and how digitalization can improve the quality of vocational education. Research results show that the application of Masterweb allows the adoption of blended learning methods that combine conventional approaches with digital elements. Collaboration with expert companies in developing e-learning and multimedia systems also ensures the availability of ICT infrastructure that supports the smooth learning process. With Masterweb, teachers and school management can be more effective in recording teaching and learning activities, monitoring student attendance, and increasing the effectiveness of monitoring and developing student skills. This research provides important insights into the importance of technology integration in education to increase efficiency, effectiveness, management and the attractiveness of learning in the digital era**

Keywords: Masterweb; Effectiveness; Digital learning

I. INTRODUCTION

Learning media in the digital era continues to undergo transformation, this is marked by the increasingly easy access of media to all groups [1]. Most users of digital learning media in vocational education see the digitalization process as an opportunity to increase accessibility and quality management of education [2]. Effectiveness of education and learning in a class will be problematic when learning management is not optimal [3]. Digitalization process in vocational education is a step to develop technological skills and improve the quality of educational management needed in an increasingly digitalized world.

State that educational transformation continues to develop through diverse learning media which involves integrating advanced technology to increase accessibility, interactivity and learning effectiveness [4]. Most users of digital learning media see the digitalization process as an opportunity to improve accessibility and education management. Masterweb is a concept where multiple web services are integrated into a centralized platform, offering seamless access and management of various online tools and resources, it aims to streamline user experience by providing a single interface for interacting with diverse online. Integration enhances efficiency and convenience, allowing users to navigate and utilize multiple online functionalities effortlessly [5]. Digitalization process in education is a step to develop technological skills and improve the quality of educational management needed in an increasingly digitalized world. For developed countries, educational management in technology-based learning activities has a positive impact in achieving various educational goals and maximally exploiting the potential of technology [6]. The research results showed that there was an increase in teacher creativity by 72% after implementing technology-based learning management. Apart from that, teachers can also present learning material in a more interesting and interactive way [7]. Rich and varied digital content can also enrich students' learning experiences and support better understanding of concepts [8].

Learning by utilizing information and communication technology can also stimulate student activity, increase student interest in the learning process so that it can increase student motivation and attention [9]. Seeing the many benefits obtained from technology, the use of technology in education needs attention [10]. One use of technology in the education sector is the use of learning media. Learning media in

the digital era continues to undergo transformation, this is marked by the increasingly easy access of media to all groups [11]

Stated that most users of digital learning media in vocational education see the digitalization process as an opportunity to improve accessibility and quality management of education [12][13]. Digitalization process in vocational education is a step to develop technological skills and improve the quality of educational management needed in an increasingly digitalized world [14].

The reality of vocational learning, especially in vocational schools today, is that there are still various dynamics of problems that have not been resolved [15]. One of them is that the implementation of digital learning and management in monitoring this learning has not been optimal [16]. Therefore, it is important to optimize technology integration to increase efficiency, effectiveness, management and attractiveness of learning [17]. Teachers and teaching staff need to understand and implement strategies for optimizing digital learning and appropriate management [18], so it is not only focused on aspects of technology-based learning media, but also on data security, managing student information, and monitoring learning [19]. The solution to existing problems is through optimizing learning with Masterweb.

MasterWeb is an application used by vocational high schools in facilitating learning management. Masterweb is an application developed to help vocational education institutions, especially vocational schools, in creating interactive digital learning systems and improving effective learning management [20]. Masterweb is currently being developed and applied to monitor the planning, implementation and evaluation of learning in vocational schools. The existence of this masterweb can be used as an effective tool in supporting learning, helping focus on monitoring learning, highlighting the need to increase the effectiveness of monitoring, and developing students' skills so that they can increase capabilities in the digital era. However, in the process of using it, further exploration is needed regarding the effectiveness of masterweb in optimizing digital-based learning and education management.

II. RESEACH METHODS

This research uses a mix method with an Exploratory Design approach. This research activity was carried out in 2 stages, to obtain instruments that were developed from findings obtained from natural settings. The first stage uses principles that apply to qualitative research, including: (1) the presence of the researcher is very important and (2) data is obtained through in-depth interviews, in addition to using documents and observations. Researchers are as instruments. The second stage is quantitative research. Second stage of research uses quantitative research, so research activities use quantitative research principles. Data collection uses a questionnaire [21].

The research location is at SMK Negeri 6 Malang which is located on JL. Ki Ageng Gribig No.28, Kedungkandang, Malang City, East Java. Research informants include the Deputy Principal for Curriculum, Head of the Head of the Machining Engineering Department, and teachers. At the end of the data, the results of the research are presented which will then be discussed further using a review of relevant literature. The researcher was guided by the grid of questions explained in Table 1.

TABLE I. GUIDELINES OR GRID (MASTERWEB ON LEARNING IN VOCATIONAL SCHOOLS)

No	Grille	Question	Data retrieval		
			Interview	Observation	Documentation
1	Understand the use and function of Masterweb	How masterweb functions in learning	✓		
		How to operate masterweb in learning	✓	✓	
		Do you have a guidebook for using Masterweb in learning?	✓		✓
		Is there a workshop on using masterweb?	✓		✓
2	Satisfaction with using Masterweb in learning planning	How to use masterweb in learning planning	✓		
		What documents need to be prepared in learning planning			✓
		What documents need to be uploaded to masterweb in learning planning	✓		✓
		What are the steps in making a learning plan on masterweb	✓	✓	
3	Satisfaction with using Masterweb in implementing learning	How to use masterweb in implementing learning	✓		
		What documents need to be prepared for implementing learning			✓
		What documents need to be uploaded to masterweb for the implementation of learning	✓		✓

No	Grille	Question	Data retrieval		
			Interview	Observation	Documentation
		What are the steps for implementing learning on Masterweb	✓	✓	

In strengthening the research results, researchers used satisfaction survey data in using the Masterweb application, by taking 30% of sources from many teachers at SMKN 6 Malang, which was carried out with interviews related to opinions regarding the use of Masterweb in learning. The survey data was calculated using a Likert scale, which is explained in Table 2.

TABLE II. LIKERT SCALE

No	Score	Category
1	4	Very satisfactory
2	3	Satisfying
3	2	Less satisfactory
4	1	Not satisfactory

The next step is quantitative research, through a Google form questionnaire to evaluate the effectiveness of Masterweb. The aim is to test the level of effectiveness of masterweb in optimizing learning. This quantitative research used a sample of 30 students.

III. RESULT AND DISCUSSION

Digital-based school management has been implemented by SMKN 6 Malang for the last 3 years from 2020 until now. The ICT-based management implemented by Vocational Schools has a very positive impact on the management system for all aspects of the school, one of which is learning. The use of information and communication technology (ICT) in the provision of institutional services has great potential to increase the effectiveness of information systems. This implementation allows the parallel adoption of blended learning methods, which combine conventional learning approaches with digital elements. Collaboration with companies that are experts in developing e-learning and multimedia systems ensures the availability of ICT infrastructure that has been prepared in advance, thereby supporting the smooth learning process [22]. Masterweb is an application developed by educational service providers to assist school institutions in creating effective, ICT-based management systems.

Currently, Masterweb continues to be used by vocational schools to monitor planning, implementation and evaluation of learning. The results of the exploratory analysis of masterweb's effectiveness at SMKN 6 Malang can be explained in Figure 1.

A. Masterweb Based Digital Learning Planning

Learning media in the digital era continues to undergo transformation, this is marked by the increasingly easy access of media to all groups. Most users of digital learning media in vocational education see the digitalization process as an opportunity to increase accessibility and quality management of education [23].

Learning planning is a systematic process carried out by teachers in designing and organizing learning activities to achieve predetermined learning objectives. This involves various steps, including identifying learning objectives, selecting appropriate teaching methods, preparing learning materials, and assessing and evaluating learning outcomes. Learning planning also includes setting a supportive learning environment, adjusting the curriculum, and using relevant and effective resources [24]. The main goal is to ensure that the learning process is efficient, effective, and in accordance with the needs and characteristics of students.

In the masterweb system, learning planning begins with inputting data on lesson hours for each teacher and inputting study groups as shown in Figure 2, which is carried out by school administration staff. This aims to provide masterweb access rights to teachers who teach subjects.

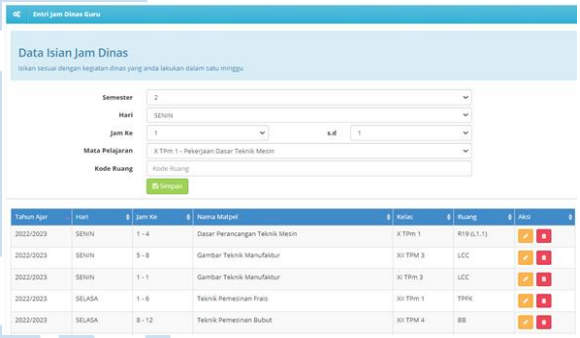

Fig. 1. Inputting Teacher Service Hours

Then the next stage is inputting core competencies and basic competencies for the K13 curriculum and inputting learning achievement elements in the independent curriculum. This input includes: attitude competency, knowledge competency and skills competency. The competency input display model contained in the curriculum is explained in Figure 3.

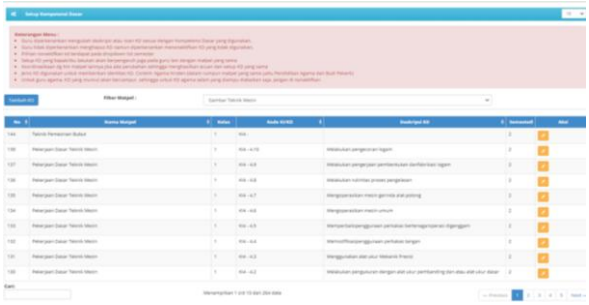

Fig. 2. Input to Core and Basic Competencies in Subjects

In learning planning, the next step is to upload teaching documents for each teacher. SMKN 6 Malang still uses 2 curricula, namely the K13 curriculum for grades 11 and 12, and the Merdeka curriculum for grade

10. In the K13 curriculum the documents uploaded to masterweb for learning planning are: semester program, annual program, and learning implementation plan. Meanwhile, in the independent curriculum, the documents uploaded to masterweb are: learning outcomes, flow of learning objectives, and teaching materials.

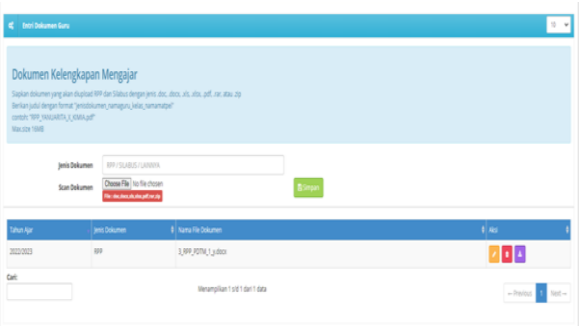

Fig. 3. Teaching Device Document Upload Process

Found that learning planning using (ICT) is very effective because it allows wider access to and is better archived in learning documents. With improved administrative efficiency, the use of ICT in learning planning also helps improve the overall effectiveness of learning by utilizing the potential of technology to support various aspects of learning [25].

B. Implementation of Masterweb-Based Digital Learning

Optimizing the integration of technology implementation is very necessary to increase efficiency, effectiveness, management and attractiveness of learning. Teachers and teaching staff need to understand and implement strategies for optimizing digital learning and appropriate management. So it is not only focused on aspects of technology-based learning media, but also on data security, managing student information, and monitoring learning [26]. The solution to existing problems is through optimizing the implementation of Masterweb in implementing learning.

Teaching and learning activity management systems such as Masterweb play an important role in facilitating teachers and school management in recapping teaching and learning activities. Masterweb or similar learning management systems have the ability to record and recapitulate student attendance during learning sessions. This feature allows teachers to monitor students' activeness in attending class and participating in learning activities. Meanwhile, at the beginning of learning, a teacher takes attendance of students, which is explained in Figure 5. Figure 5 explains the page on Masterweb which functions to take attendance of students by a teacher.

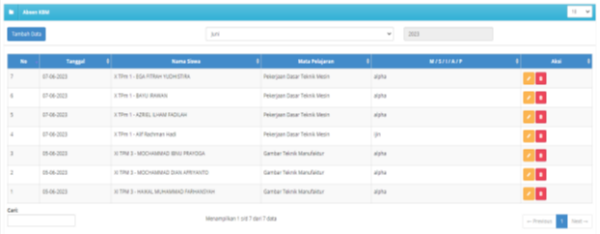

Fig. 4. Input of Student Attendance for Each Lesson

Then the teacher continues to fill in the teaching journal which is explained in Figure 6. The menu for uploading the teaching journal on Masterweb consists of filling in subjects, core competencies and basic competencies that are being implemented, learning implementation journals and documentation.

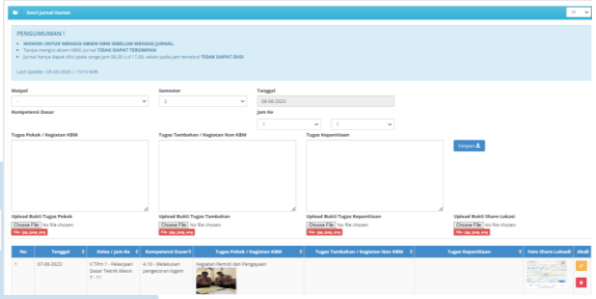

Fig. 5. Journal of Learning Implementation

Masterweb filling in the implementation of learning carried out by teachers is integrated into the analysis report of the curriculum staff section which is used to monitor learning, so that the curriculum staff section can record student attendance and summarize the results of the learning implementation journal that has been carried out by the teacher.

C. Exploring the Effectiveness of Masterweb in Optimizing Digital-Based Learning and Education Management

Masterweb is an application developed to help vocational education institutions create interactive digital learning systems and improve effective learning management. Masterweb is currently being developed and applied to monitor planning, implementation and evaluation of learning. The existence of masterweb can be used as an effective tool in supporting learning, helping to focus on monitoring learning, highlighting the need to increase the effectiveness of monitoring, and developing students' skills so that they can increase capabilities in the digital era. The satisfaction of a teacher in using a webmaster in learning is explained in Figure 7.

Fig. 6. Recapitulation of Teacher Satisfaction in Implementing the Use of Masterweb in Learning

Based on the results of a survey conducted by researchers on 30% of the total number of 100 teachers, both productive and normative teachers, it was found that 30 teachers were used to conduct a satisfaction survey for using the Masterweb application. The survey results showed that 22 teachers chose very satisfactory, 5 teachers chose satisfactory, and 3 teachers chose unsatisfactory. In this regard, it can be formulated that the Masterweb application has a positive impact on vocational school learning and management, as well as making it easy for teachers to review learning stages. Meanwhile, for those who choose less satisfaction, this may be due to the age of the teacher who has passed the productive limit and has not yet mastered the Masterweb application in learning.

Quantitative research shows that there are 66.7% effective responses, 30% moderately effective responses, and 3.3% ineffective responses. These results show that masterweb is effective and really helps students in learning. The following is data from the results of a questionnaire to 30 students regarding the effectiveness of Masterweb.

TABLE III. EFFECTIVENESS OF MASTERWEB IN LEARNING

	N	Mean	Stdv	Min	Max
Effectiveness of use	208	3.64	0.563	3	5
Ease of Use	208	3.92	0.568	2	5
Learning Management System	208	5.00	2.585	1	9

IV. CONCLUSION

The implementation of information and communication technology-based management using Masterweb implemented in vocational schools has had a very positive impact on the learning management system. Starting from the implementation of Masterweb in learning planning which includes: uploading KIKD and teaching tools for teachers, while for school administration officers uploading personnel biodata and service hours of teachers who teach. The implementation of Masterweb in implementing learning includes: student attendance activities and uploading journals of learning activities carried out by teachers, then the curriculum staff recapitulates student absences and monitors learning activity journals. The level of satisfaction with the implementation of information and communication technology -based management using the results of a survey conducted by teachers at vocational schools showed that the frequency of 22 people chose very satisfactory in the use and use of Masterweb in implementing learning.

ACKNOWLEDGMENT

Thank you to Raden Rahmat Malang University and Malang State University for their support so that researchers can complete this research according to the target.

REFERENCES

[1] M. A. Shabur and M. R. Siddiki, "Investigating Social Media's Impact on the New Era of Interactive Learning: A Case Study of Bangladesh.," *Available SSRN 4554916*, 2024.

[2] M. R. Amalia, "The Impact of Digital Transformation on Human Resources Management," *Manag. Stud. Bus. J.*, vol. 1, no. 1, pp. 89–98.

[3] Y. Zheng *et al.*, "Effects of digital game-based learning on students' digital etiquette literacy, learning motivations, and engagement," *Heliyon*, vol. 10, no. 1, 2024.

[4] B. Soesatyo, "The Staples of the State Policy as the Legal Basis for Sustainable Development to Face the Industrial Revolution 5.0 and Golden Indonesia 2045," *Int. J. Eng. Bus. Soc. Sci.*, vol. 2, no. 03, pp. 1009–1019, 2024.

[5] E. D. Wasliman, "Building A Golden Generation Through Character Education," *IJOBBA*, vol. 2, no. 2, pp. 202–209, 2024.

[6] M. Multazam, Z. Syahrial, and R. Rusmono, "Development of Learning Models in Computer-Based Learning Tutorials," *Urkish Online J. Distance Educ.*, vol. 24, no. 2, pp. 232–244, 2023.

[7] J. Shaturaev, "2045: Path to nation's golden age (Indonesia Policies and Management of Education)," *.Science Educ. Sci. J.*, vol. 2, no. 12, pp. 866–875, 2021, doi: https://orcid.org/0000-0003-3859-2526.

[8] H. Sulistyanto *et al.*, "Web Application Training with Hypermedia Engineering to Increase Global Marketing Competitiveness of Decorative Umbrella Industry," *Pros. Univ. Res. Colloq.*, pp. 160–168, 2022.

[9] K. Loderer, R. Pekrun, and J. C. Lester, "Beyond cold technology: A systematic review and meta-analysis on emotions in technology-based learning environments," *Learn. Instr.*, vol. 70, no. 8, pp. 1–5, 2020, doi: https://doi.org/10.1016/j.learninstruc.2018.08.002.

[10] H. Sulistyanto *et al.*, "Web Application Training with Hypermedia Engineering to Increase Global Marketing Competitiveness of Decorative Umbrella Industry," *Pros. Univ. Res. Colloq.*, pp. 160–168, 2022.

[11] R. Roemintoyo and M. K. Budiarto, "Flipbook as Innovation of Digital Learning Media: Preparing Education for Facing and Facilitating 21st Century Learning," *ournal Educ. Technol.*, vol. 5, no. 1, p. 8, 2021, doi: https://doi.org/10.23887/jet.v5i1.32362.

[12] M. L. Bernacki, J. A. Greene, and H. Crompton, "Mobile technology, learning, and achievement: Advances in understanding and measuring the role of mobile technology in education," *Contemp. Educ. Psychol.*, vol. 60, p. 101827, 2020, doi: https://doi.org/10.1016/j.cedpsych. 2019.101827.

[13] K. M. Soria, I. Chirikov, and D. Jones-White, "The Obstacles to Remote Learning for Undergraduate, Graduate, and Professional Students," *SERU Consortium, Univ. California-Berkeley Univ. Minnesota*, vol. 1, pp. 1–6, 2020.

[14] R. A. Rasheed, A. Kamsin, and N. A. Abdullah, "Challenges in the online component of blended learning: A systematic review," *Comput. Educ.*, vol. 144, no. 9, p. 103701, 2020, doi: https://doi.org/10.1016/j.compedu. 2019.103701.
[15] D. Asyri and D. Asyri, "The Role of Multimedia on Virtual Teachers in the Digital Era to Carve the Educational Future of Indonesia's Golden Generation," *J. Digit. Learn. Distance Educ.*, vol. 2, no. 7, pp. 622–634, 2024.
[16] N. Ismiyani, Suparjan, and I. Timmis, "Students' Voices on Online Learning: Constraints, Dissatisfactions, and Expectations," *Int. J. Interact. Mob. Technol.*, vol. 18, no. 03, pp. 117–128, 2024, doi: https://doi.org/10.3991/ijim.v 18i03.42221.
[17] A. J. Schroder, M. Cuypers, and A. Gotting, "From Industry 4.0 to Industry 5.0: The Triple Transition Digital, Green and Social," *Ind. 4.0 Road to Sustain. Steelmak. Eur. Recasting Futur. Cham Springer Int. Publ.*, vol. 35, no. 51, 2024.
[18] G. A. Puniatmaja, N. N. Parwati, I. M. Tegeh, and I. G. W. Sudatha, "The Effect of E-learning and Students' Digital Literacy towards Their Learning Outcomes," *Pegem J. Educ. Instr.*, vol. 14, no. 1, pp. 348–356, 2023.
[19] R. Alexandro and B. Basrowi, "Measuring The Effectiveness Of Smart Digital Organizations On Digital Technology Adoption: An Empirical Study Of Educational Organizations In Indonesia," *Int. J. Data Netw. Sci.*, vol. 8, no. 1, pp. 139–150, 2024.
[20] S. Vongillern, M. Korona, W. Wright, H. Gould, and B. Haskey-Valerius, "Media literacy, digital citizenship and their relationship: Perspectives of preservice teachers," *Teach. Teach. Educ.*, vol. 138, p. 104404, 2024.
[21] N. Ulfatin, "Qualitative research methods in education: theory and application: case studies, ethnography, symbolic interaction, and action research in the context of educational management," p. 184, 2015.
[22] J. Hakansson and C. H. Adolfsson, "Local education authority's quality management within a coupled school system: Strategies, actions, and tensions," *ournal Educ. Chang.*, vol. 23, no. 3, pp. 291–314, 2022, doi: https://doi.org/10.1007/s10833-021-09414-6.
[23] M. A. Shabur and M. R. Siddiki, "Investigating Social Media's Impact on the New Era of Interactive Learning: A Case Study of Bangladesh," *Available SSRN*, p. 4554916, 2024.
[24] S. Darche, N. Nayar, and K. R. Bracco, "Work-Based Learning in California," *November*, vol. 1, no. 3, 2020.
[25] H. R. Lourenço and M. G. Ravetti, "Supply Chain Management BT - Handbook of Heuristics (R. Martí, P. M. Pardalos, & M. G. C. Resende (eds.); pp. 1241–1258)," *Springer Int. Publ.*, 2018, doi: https://doi.org/10.1007/978-3-319-07124-4_54.
[26] N. N. Parwati, I. M. Tegeh, and I. G. W. Sudatha, "Puniatmaja, G. A., The Effect of E-learning and Students' Digital Literacy towards Their Learning Outcomes," *Pegem J. Educ. Instr.*, vol. 14, no. 1, pp. 348–356, 2023, doi: https://doi.org/10.47750/pegegog.14.01.39.