

DEVELOPMENT OF ELECTRONIC ARCHIVES MANAGEMENT LEARNING MEDIA (E-ARCHIVING) USING THE MICROSOFT ACCESS APPLICATION FOR STUDENTS OF SMKN 40 JAKARTA

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ABSTRACT

This research aims to develop an Electronic Archives Management (E-Archive) learning media using Microsoft Access for students at SMKN 40 Jakarta. The method used is Research and Development with a 4D development model (Define, Design, Develop, and Disseminate), although this study was limited to the first three stages due to time constraints. The product developed is a digital learning module integrated with Microsoft Access, designed to enhance students' understanding of archiving practices in the digital era. Validation results from material, design, and media experts yielded an average score of 91%, categorized as "very feasible," while practicality tests involving 36 students through individual, small group, and large group trials produced an average score of 92%, categorized as "very practical." These findings indicate that the media is both feasible and practical for use in teaching archival management. The research contributes by offering updated instructional content, an interactive design suited to current student preferences, and a user guide to facilitate learning with Microsoft Access. Future studies are encouraged to expand testing, integrate broader topics, and explore alternative platforms beyond Microsoft Access to improve accessibility and adaptability.

Keywords: learning media; electronic archive; Microsoft Access; vocational education; 4D model.

ABSTRACT

This research aims to develop Microsoft Access-based Electronic Archive Management (E-Archive) learning media for students of SMKN 40 Jakarta. The method used is Research and Development with the 4D development model (Define, Design, Develop, and Disseminate), although this research is limited to the first three stages due to time constraints. The product developed is a digital learning module integrated with Microsoft Access, designed to improve students' understanding of archival practices in the digital era. The validation results from material experts, design experts, and media experts resulted in an average score of 91%, with the category "very feasible", while the practicality test involving 36 students through individual, small group, and large group trials resulted in an average score of 92%, with the category "very practical". These findings indicate that the media is feasible and practical for use in teaching archival management. This research contributes by offering up-to-date learning content, an interactive design that matches students' current preferences, and a user guide to facilitate learning with Microsoft Access. Future research is encouraged to expand testing,

integrate a wider range of topics, and explore alternative platforms beyond Microsoft Access to improve accessibility and adaptability.

Keywords: learning media; electronic archive; Microsoft Access; vocational education; 4D model.

INTRODUCTION

Vocational High Schools (SMK) are expected to equip students who have graduated to be ready to work. Thus, the learning process must be able to equip students in skill competencies that are adapted to the problems of the world of work (Ragil & Dwi, 2024). The Office Administration skill competency has an element of archive management. This archive management should be used digitally. However, the learning outcomes in this archive management element are still not optimal. Solutions that can be done in increasing student absorption in learning this archive management can be by developing learning media. And increasing thinking power in the learning process is by developing a set of skills for the lesson media to be delivered (Rohima, 2023).

Microsoft Access is an application made by the microsoft company that is useful for designing, creating, and managing databases or better known as data bases. Microsoft Access greatly facilitates matters related to data management in a business company or organizational institution, not only that, Microsoft Access can also facilitate matters in the field of education. Such as creating, organizing, editing and deleting data on student and teacher schedules, the needs of the administrative and library departments to other matters related to archival management. Microsoft Access can also be used as a learning medium for archival management elements. However, although Microsoft Access offers various advantages, the use of this learning media is still limited in various educational institutions. There are various challenges faced by educators and learners in utilizing Microsoft Access as a learning media, including limited technical understanding, limited resources (Prasetyo, 2018).

The results of research observations at SMK Negeri 40 Jakarta related to archival management using questionnaires show that most students are more interested in using Microsoft Access as a learning medium for archival management. However, it is unfortunate that some teachers still rely on printed books as learning media for archive management and still rely on conventional archive management compared to using Microsoft Access, this situation can result in many students feeling bored with the material presented, because it tends to be monotonous and difficult to understand and practice. Some students already have an understanding of Microsoft Access, although there are still some who are not familiar and need further guidance on how to use it for archive management. This shows that there is potential to improve the understanding and utilization of Microsoft Access in the learning that is done. Therefore, in overcoming these problems, teachers need to be innovative in developing learning media in accordance with technological developments (Amelia et al., 2023).

Based on Wirawan & Rahmanto (Wirawan & Rahmanto, 2017), the results of the study concluded that digital archiving learning media effectively improved student learning outcomes. Meanwhile, according to Amalia & Panduwinata (A. T. Amalia & Panduwinata, 2022) the development model used is 4D, namely Define, Design, Development, and Disseminate. The trial results show that the Microsoft Access-based archiving application is said to meet the eligibility test criteria adapted from several experts after going through the survey data collection process in the form of validation sheets distributed to all Media Experts, Design Experts, and Practitioner Experts. Also according to Kuswantoro & Ashari

(Kuswantoro & Ashari, 2018) the results of this study are that there are obstacles in the Microsoft Access program learning E-Archive, namely files cannot be edited, cannot move to the previous archive, and cannot move to the next archive, therefore it is necessary to have an instruction manual in installing and operating a software-based learning archive application because it requires coherent stages and the existence of a supporting program and practice using it first.

Thus, based on the results of observations regarding student interest in electronic archive management (E-Archive) using Microsoft Access researchers, and also the results of previous studies have revealed that most of the developments that have been carried out use Microsoft Access, these findings indicate that updates and creation and training using Microsoft Access need to be done. Therefore, this research emphasizes the development of electronic archive management (E-Archive) Using Microsoft Access in line with the update of new materials, making and trying to make an instruction manual in the operation of the application that will be made at SMK Negeri 40 Jakarta. The novelty of this research compared to previous research lies in the design of products that are in accordance with the development and interests of today's children, the latest material, the development model used is 4D which then only reaches the 3D stage, and makes operating instructions for the application to be made.

METHOD

This research and this study were conducted at SMK Negeri 40 Jakarta for students in class XI MP (Office Management), precisely on Jl. Nanas II, Utan Kayu Utara, Kec. Matraman, East Jakarta. The time in this research and development was carried out in June 2025 until the stages in this research and development were completed and obtained the data needed by the researcher. The subjects in this study were 1 media expert from a lecturer at Jakarta State University, one learning design expert from a lecturer at Jakarta State University, two material experts from teachers at SMK Negeri 40 Jakarta, and 36 students of class XI MP SMK Negeri 40 Jakarta.

This research uses the Research and Development method. In this study, what will be developed is learning media using the 4D development model (Define, Design, Development, and Disseminate) this development model was developed by Sivasailam Thiagarajan, Dororthy S. Semmel, and Melvyn I. Semmel in 1974. Semmel in 1974. The 4-D model is a development model that can be used to develop various learning media (Arkadiantika et al., 2020). After going through the development process in training, this model is called the Four-D model which consists of four stages: define, design, develop, and disseminate (Harvianto, 2021). Figure 1 is a flowchart of media research and development. Research is usually used to produce a certain product and then test the effectiveness of the product that has been made.

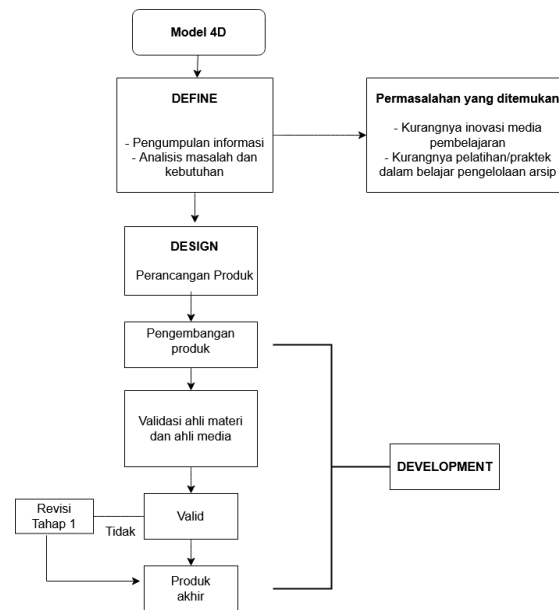


Figure 1. 4D Development Flow

The 4D development model uses four stages in its application. However, based on the figure above, the development flow used by researchers uses the 4D research and development model, but the research steps used by researchers are only limited to the development stage, namely producing products, because of the short research time constraints, the research is not possible to reach the dissemination stage. In this study, three stages of development were carried out, namely Define, Design, and Development:

Research Instruments

The instrument is an evaluation tool as a determinant of research success. This instrument will serve as a tool in collecting the necessary data. This research instrument can be a questionnaire or validation sheet to determine the feasibility of content and provide input in the development of electronic archive management (E-Archive) using Microsoft Access. The expert validation sheet for this study was adapted from several experts, consisting of material validation sheets, design validation sheets, media validation sheets and student response sheets.

Table 1. Lattice - Lattice of Material Expert Validation Sheet

No	Aspect	Indicator	Reference
1.	Content or Material	a. Accuracy of material b. Completeness of material c. Interest and attention of students	Utami (A. M. Utami, 2020)
2.	Learning	a. Providing learning opportunities b. Motivating quality c. Flexibility of learning d. social quality of learning interaction e. impact on students and teachers	Utami (A. M. Utami, 2020)

Source: (A. M. Utami, 2020)

Table 2. Learning Design Expert Validation Sheet Grid

Aspect	Indicator	Reference
1. Learning Objectives	a. Suitability of learning objectives	(Alti et al., 2022)
2. Learning Objectives	a. Appropriateness of learning objectives at the learning activity stage	
3. Learner/Learning Method	a. Suitability of methods with learning objectives b. Suitability of learning methods with learner	

		characteristics
		c. Effectiveness of learning method
4.	Learning Analysis	a. Suitability of media with learning objectives
		b. suitability of learning media with learning activities
		c. suitability of media with learning methods
		d. suitability of media with the characteristics of students
5.	Learning Strategy	a. Appropriateness of time allocation for each stage of learning activities
6.	Learning Assessment	a. Suitability of assessment tests with learning objectives

Source: (A. M. Utami, 2020)

Table 3. Lattice of Learning Design Expert Validation Sheet

	Aspect	Indicator	Reference
1.	Learning Objectives	a. Appropriateness of learning objectives	
2.	Learning Objectives	a. Appropriateness of learning objectives at the learning activity stage	
3.	Learner/Learning Method	a. Suitability of methods with learning objectives	
		b. Suitability of learning methods with learner characteristics	
		c. Effectiveness of learning method	
4.	Learning Analysis	a. Suitability of media with learning objectives	(Alti et al., 2022)
		b. suitability of learning media with learning activities	
		c. suitability of media with learning methods	
		d. suitability of media with the characteristics of students	
5.	Learning Strategy	a. Appropriateness of time allocation for each stage of learning activities	
6.	Learning Assessment	a. Suitability of assessment tests with learning objectives	

Source: (A. M. Utami, 2020)

Table 4. Grid of Media Expert Validation Sheet

No	Aspect	Indicator	Reference
1.	Technical Quality	a. Ease of learning process	Utami (A. M. Utami, 2020)
2.	Design Quality	a. Readability	
		b. Display or image quality	
		c. Quality of learning media management	

Source: (A. M. Utami, 2020)

Table 5. Student Response Sheet Grid

No	Aspect	Indicator	Reference
1.	Content or material	a. Accuracy	Fatimah & Syarwani (S. Fatimah & Syarwani, 2022)
		b. Completeness	
		c. attraction	
2.	Media Quality	a. Usability	Fatimah & Syarwani, 2022)
		b. Display quality	

Source: (Fatimah & Syarwani, 2022)

Data Analysis Technique

Researchers made a validation sheet in which there were several statements. Then the validator fills out the questionnaire by checking the categories provided by the researcher. According to Sugiyono in Lestari et al. (Lestari et al., 2018), the Likert scale is used to measure the views, attitudes, and perceptions of individuals or groups on social issues. The 1-5 Likert scale is also known to be easy to use and effective in collecting data from respondents. Therefore, researchers distributed surveys using a Likert scale consisting of five assessment scores as follows:

Table 6. Validation Assessment Score Table

Description	Score
Very Good (SB)	5
Good (B)	4
Good enough (CB)	3
Not Good (TB)	2
Very unfavorable (STB)	1

Source: (Lestari et al., 2018)

The validation scores that have been listed in the learning media validation sheet will be analyzed using the index formula. The formula used to calculate data from material experts, design experts and media experts is as follows:

$$P = \frac{f}{N} \times 100\%$$

P explains the number of questionnaire data presentations, f is the number of scores obtained, and N states the maximum number of scores. Furthermore, the results of the percentage can be interpreted to test the feasibility into categories based on table 7. From table 7, we can know that the learning media is said to be feasible if the percentage of feasibility can reach 61%.

Table 7. Eligibility Criteria

Results	Category
81% - 100%	Very Feasible
61% - 80%	Feasible
41% - 60%	Moderately Feasible
21% - 40%	Not Feasible
0%-20%	Very Not Feasible

Source: (Andi Rustandi & Rismayanti, 2021)

Those who act as testers to determine the practicality test are students and educators. Researchers made a questionnaire sheet which contained several questions. Then students fill out the questionnaire by checking the categories provided by the researcher based on a Likert scale consisting of 5 assessment scores as follows:

Table 8. Practicality Assessment Score

Description	Score
Very Good (SB)	5
Good (B)	4
Good enough (CB)	3
Not Good (TB)	2
Very unfavorable (STB)	1

Source: (Wahyuni et al., 2023)

The scores that have been listed in the questionnaire sheet will be analyzed and use the same index formula as the validation test. Furthermore, the results of the percentage can be interpreted to test practicality into categories based on the following table:

Table 9. Practicality Criteria

Result	Category
81% - 100%	Very Feasible
61% - 80%	Feasible
41% - 60%	Moderately Feasible
21% - 40%	Not Feasible
0%-20%	Very Not Feasible

Source: (Isnaini et al., 2022)

From the table above, we can know that learning media can be said to be effective if the feasibility percentage has reached 61%, then the learning media is considered practical.

RESULTS AND DISCUSSION

Define

In the defining stage, researchers identified student needs through a questionnaire filled out by students in class XI Office Management. The results show that archive learning still depends on books and PowerPoint, so students have difficulty understanding the material. Considering the importance of electronic records management in the digital workplace, as well as the high interest of students in using Microsoft Access, the development of more varied and interactive learning media is needed.

Design

At this stage, researchers began designing learning media that would be used after completing the definition. At this point, the researcher designs the learning media based on the findings of the previous investigation. Furthermore, researchers create appropriate flowcharts to facilitate the process of making applications.



Figure 2. Flowchart of Learning Media Creation

Development

At this stage, researchers make a product, namely learning media using Microsoft Access as a learning medium. This development stage includes several things, namely:

Making Learning Media

After designing the learning media, the next stage is development. In this development process carried out by creating learning media as a whole, researchers began designing learning media to be developed using Microsoft Access, namely formulating material and determining product design by selecting pallets, *backgrounds*, *fonts*, illustrations, and others that support the creation of learning media. Furthermore, researchers also link images, exercises and evaluation questions that have been made through google form into the learning media.

Product Validation

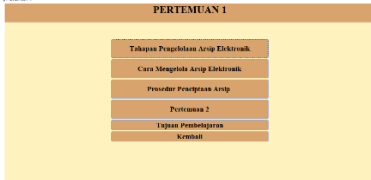
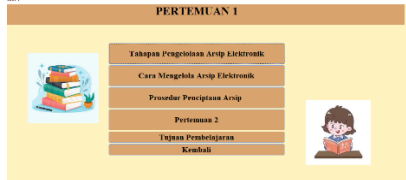


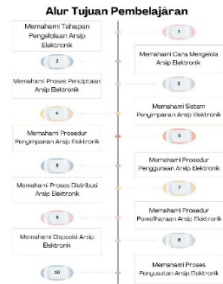
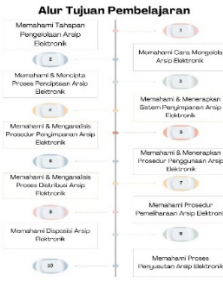
After the media is created and developed, then enter the validation process stage to test the feasibility of the product. This validation stage was carried out by several validators, namely material experts from SMKN 40 Jakarta teachers, learning design experts and media experts from Jakarta State University lecturers.

Based on calculations from all validator experts, it shows that the learning media for electronic archive management using Microsoft Access developed by researchers get the results of material expert validation with a percentage of 100% **very feasible** category, learning design experts with a percentage of 86% **very feasible**, and media experts 88% **very feasible** category. Based on this assessment, it obtained an average of 91% with a **very feasible** category. So, it can be concluded that the learning media developed is very feasible to use or can be tested on students in the learning process. Although there are still revisions to be improved by researchers so that the learning media developed is in accordance with the assessment.

Revision

Based on the assessment of the validators, the learning media for electronic archive management using Microsoft Access can be declared "**very feasible**" and can be tested on students of class XI MP. However, before being tested on students, the stage that must be done is to revise the learning media according to the improvement suggestions given by the validator. As for some revisions made to the learning media developed in table 10 as follows:

Revision of Learning Media

Description	Before Revision	After Revision
Adding pictures that support		
Learning outcomes are embedded		
Operational verbs are improved according to learning.		

Description	Before Revision	After Revision
Place navigation according to substance		
Add material-serving activities		
Add examples		
Add questions and question instructions.		
Enlarged button		
Enlarged font on menu header		
Learning objectives enlarged to make them legible		
The material of archive distribution was clarified.		

Field Trial

The field trial stage is still a stage of the development stage, namely learning media products that have been developed and tested for feasibility and through the revision process, will be tested to determine the level of practicality. This trial was conducted by 36 students of class XI MP.

Table 11: Results of One to One Evaluation Data Analysis

Responden t	Score	Maximum Score	Percentage	Category
Student 1	48	50	96%	Very Practical
Student 2	46	50	92%	Very Practical
Student 3	45	50	90%	Very Practical
Total	139	150	93%	Very Practical

Based on the results of the one to one evaluation data analysis above, a percentage of 93% was obtained which was included in the **very practical** category. So, it can be concluded that the learning media developed is very practical to use or can already be tested at the next stage, namely the small group trial. The comments and suggestions given are that the learning media is very effective to use because it includes material, exercises, and even questions.

Table 14. Results of Small Group Trial Data Analysis

Respondent	Score	Maximum Score	Percentage	Category
Student 1	82	85	96%	Very Practical
Student 2	72	85	85%	Very Practical
Student 3	82	85	96%	Very Practical
Student 4	81	85	95%	Very Practical
Student 5	83	85	98%	Very Practical
Student 6	75	85	88%	Very Practical
Student 7	78	85	92%	Very Practical
Student 8	74	85	87%	Very Practical
Student 9	78	85	92%	Very Practical
Student 10	82	85	96%	Very Practical
Total	787	850	92%	Very Practical

Based on the data analysis from the small group trial above, a percentage of 92% was obtained which is included in the **Very Practical** category. Thus, it can be concluded that the learning media developed is very practical to use and ready to be tested at the next stage, namely the large group trial. The comments and suggestions received stated that the learning media in terms of material and design were good and good.

Table 13: Results of Data Analysis for the Large Group Trial

Respondent	Score	Maximum Score	Percentage	Category
Student 1	82	85	96%	Very Practical
Student 2	75	85	88%	Very Practical
Student 3	84	85	99%	Very Practical
Student 4	72	85	85%	Very Practical
Student 5	82	85	96%	Very Practical
Student 6	83	85	98%	Very Practical
Student 7	73	85	86%	Very Practical
Student 8	73	85	86%	Very Practical
Student 9	73	85	86%	Very Practical
Student 10	76	85	89%	Very Practical
Student 11	84	85	99%	Very Practical

Student 12	74	85	87%	Very Practical
Student 13	77	85	91%	Very Practical
Student 14	76	85	89%	Very Practical
Student 15	75	85	88%	Very Practical
Student 16	75	85	88%	Very Practical
Student 17	78	85	92%	Very Practical
Student 18	73	85	86%	Very Practical
Student 19	79	85	93%	Very Practical
Student 20	74	85	87%	Very Practical
Student 21	77	85	91%	Very Practical
Student 22	79	85	93%	Very Practical
Student 23	77	85	91%	Very Practical
Total	1771	1955	91%	Very Practical

After the small group trial stage, the next stage was the large group trial. The large group trial was carried out by all students in class XI MP, except those who had participated in one-on-one trials and small group trials, namely 13 students. The following are the results of the large group trial conducted by 23 students using a questionnaire. Based on the results of the large group trial data analysis in the table above, a percentage of 91% was obtained, which is included in the **very practical** category.

Discussion

Learning Media Development

This development process uses the 4D development model (*Define, Design, Development, Disseminate*), developed Electronic Archive Management Learning Media (E-Archive) using the Microsoft Access application for SMKN 40 Jakarta Students. The results of this process only reach the *development* stage.

The defining stage, identifying student needs in the learning process by examining various aspects related to learning challenges. This definition is known that the learning media used in archive management learning activities only use textbooks or powerpoints provided by the teacher, so there are still many students who are still confused about understanding the archive management material explained by the teacher. Because the learning media is less varied and observations also show high enthusiasm from students for the development of learning media using Microsoft Access, this can be the basis for developing the learning media further.

The design stage, at this stage, the researcher begins to design the learning media to be developed according to the results of defining, designing, and previous ideas. Furthermore, researchers make a *flow* that will facilitate the process of making a website, by making a *flowchart*.

The development stage, at this stage the researcher first tests the product to material experts, learning design experts, and media experts, after getting suggestions and

improvements from the validator the researcher revises the product before the product is given to the *one to one evaluation* test, small groups and large groups. then the researcher gives the product to the *one to one evaluation* test group, small groups and large groups to test the practicality of the product developed.

Feasibility of Learning Media

The Learning Media developed is said to be feasible if it has gone through validation tests from several experts. Learning media using Microsoft Access developed by researchers is good or feasible to use, this is in accordance with the results of the validation analysis that has been assessed by several experts, namely:

Table 14. Feasibility of Learning Media

Validation	Percentage	Description
Material Expert	100%	Very Feasible
Learning Design Expert	86%	Very Good
Media Expert	88%	Very Good
Total	91%	Very Feasible

Source: Processed by researchers 2025

From these three validators, an average percentage value of 91% can be taken with a very feasible category, namely that the learning media is "**very feasible**" to be used and tested. Although there are still some revisions that must be corrected by researchers so that the learning media developed is in accordance with the assessment in terms of material, design, and media.

This is supported by Bushido & Muklis (Bushido & Muklis, 2023) that development with the 4D model (*Define, Design, Development, Dissminate*) on electronic archive management shows a score of 86%, 91.38%, 92%, and 94% in the "very feasible" category in their research. In line with the opinion of Zarlaini et al (Zarlaini et al., 2023) that Microsoft Access has been said to be valid and effective to use.

Practicality of Learning Media

The learning media developed is said to be practical if it has gone through a practicalization test conducted by students. Researchers conducted a practicalization test on students of class XI MP SMKN 40 Jakarta with a total of 36 students. The practicalization test was carried out through three stages, namely:

Table 15. Practicality of Learning Media

Practicalization Test	Percentage	Description
<i>One to One Evaluation</i> Test	93%	Very Practical
Small Group Trial	92%	Very Practical
Large Group Trial	91%	Very Practical
Total	92%	Very Practical

From the three stages of the test, an average percentage value of 92% can be taken which is categorized as very practical, that is, the learning media is very practical to use and can be used for learning activities.

Meanwhile, according to Sari (M. O. Sari, 2024) revealed that the practicality of the media was measured through questionnaire sheets from students, with the results of 89.6%, 75.7%, and 86.6% which were classified as very good. According to Mardawati et al (Mardawati et al., 2025) Microsoft Access is suitable for learning media and this is in line with Hanny & Fajar's research (Hanny & Fajar, 2021) which shows that learning media using Microsoft Access can be used as an alternative to learning.

CONCLUSION AND RECOMMENDATION

The results of the development of learning media for *Electronic Records Management (E-Archive)* using the Microsoft Access application for students of SMKN 40 Jakarta show that the module developed through the *define, design, and development* stages is considered feasible and practical to use. The feasibility of this media is proven through validation tests by material, learning design, and media experts, with an average result of 91% in the very feasible category, as well as a practicality test by 36 MP XI class students which shows an average value of 92% in the very practical category. Based on these results, the researcher suggests that future studies expand the scope of trial subjects, develop learning media for various materials, explore the use of other platforms besides Microsoft Access such as the web or other digital applications, and pay attention to increasing access to technology in schools, including the provision of stable internet, especially in remote areas.

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