Electronic Journal of Education, Social Economics and Technology
Vol. 5, No. 2, (2024), pp. 35~43
ISSN 2723-6250 (online)
DOI: https://doi.org/10.33122/ejeset.v5i2.224

SAINTIS publishing

Research Article/Review Article

Development of an Electronic Archive System Application (*Star App*) as Archival Learning Media at IPIEMS Vocational High School Surabaya City

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ABSTRACT

In accordance with the skills needed by human resources in the 21st century, education is one of the steps to be able to improve these skills. Learning implemented in schools is expected to be able to develop students' skills, one of which is in the use of information technology. In the world of education, electronic records management is one of the important competencies, especially for SMK students majoring in Office Management and Business Services (MPLB). However, observations at SMK IPIEMS Surabaya show that learning electronic records management has not been optimal. The use of Microsoft Access as learning media has various limitations, so that more than 50% of students are not yet skilled in electronic records management. For this reason, technology-based learning media such as the web-assisted electronic archive system application (Star App) is required. Star App is designed to facilitate students in practising electronic archive management, including data entry, archive retrieval and archive retention. This application is equipped with electronic archive theory material that makes it easier for students to understand concepts and practices. Previous research proves that web-based learning media is effective in improving student learning outcomes and skills. Thus, the development of Star App is expected to improve the quality of electronic archiving learning and students' skills in facing the challenges of the digital era.

Keywords: Education; Application; Learning Media; Electronic Archiving

1. INTRODUCTION

The 21st century is marked by the era of the industrial revolution 4.0 which has an impact on various sectors. In this era, humans are required to follow changes and improve the quality of human resources in all their efforts and work results. Rapid changes occur in the fields of information and digital technology that take place in everyday life. In addition, the 21st century is also marked by the abundance of information and communication activities that can be accessed anywhere and anytime, increasingly fast computing, and automation that can replace routine work. The demands of the 21st century require humans to have 21st century skills that can be achieved through 21st century learning. The 21st century skills include life and career skills, learning and innovation skills, and information media and technology skills (Hamdani, 2020). The use of information technology can make it easier for humans to complete work (Jejen, 2021). Automation has occurred in various sectors, one of which is the office. The change from manual to electronic processes can make office activities effective and efficient, one of which is archiving activities. Previously, archives were stored manually using various archival equipment and supplies. This caused several shortcomings such as waste of costs and storage space, damage, and the possibility of loss of archives. Therefore, currently archival activities have switched to using electronic archives. Electronic archives are a system for collecting and storing information in the form of electronic documents that have the aim of being easy to view, manage, find and reuse (Putra & Nelisa, 2020).

Based on existing phenomena, technological developments in the office world make work much more effective and efficient, including in archive storage activities. Archives that are stored conventionally require a lot of equipment and storage space, this makes archive storage activities shift from conventional archives to electronic archives which are more practical and save space and storage costs. In the world of education, especially vocational schools majoring in Office Management and Business Services (MPLB) which were formerly known as the Office Automation and Governance major, there are also basic competencies in implementing electronic archive management with the hope that students have the skills to store archives electronically.

Basic competencies in implementing electronic archive management are one of the basic competencies in the Archival subject. This subject is taught to students in grade X of the Office Management and Business Services expertise program. The importance of the archiving subject, especially the basic competency of implementing electronic archive management, is used to prepare competent workers and provide knowledge about storing archives electronically. The development of

technology means that archive storage is not only stored conventionally, but also electronically, which makes the work of storing archives more effective and efficient. So that in the process of learning archiving, the basic competency of implementing electronic archive management, students are expected to be able to master the material about electronic archives and be able to apply it in the world of work and to be able to follow changes in the 21st century.

One of the schools that has implemented electronic archiving learning is SMK IPIEMS. This digital-based school located at Jalan Raya Menur No. 125 Surabaya has a major in Office Management and Business Services which also received the best school progress award from the Minister of Education, Culture, Research, and Technology of the Republic of Indonesia in 2023. However, based on the results of observations, it was found that in the learning process of the archiving subject, the basic competency of implementing electronic archive management at SMK IPIEMS Surabaya had not been optimally taught to class X MPLB students because the application used was assisted by Microsoft Access as an application for processing various types of data. The application has shortcomings, including requiring an installation process, the maximum data capacity is 2GB, can only be used on a local scale, repeated data storage often occurs, and requires a long process to process data. This affects student learning outcomes, because the application used is not in accordance with the electronic archive storage procedure. There are more than 50% of class X MPLB students who are not yet skilled in electronic archive management.

Based on these problems, learning media are needed that can facilitate students to practice electronic archive management because skills in electronic archive management are useful as provisions for students in entering the world of work. The use of learning media can make it easier for students to understand the subject matter presented, and make it easier for teachers to deliver the subject matter (Nurfadhillah et al., 2021). The selection of learning media that is in accordance with learning objectives, student characteristics, basic competencies taught, and supporting facilities and infrastructure is needed to create effective and targeted learning (Hasan, 2021). The electronic archive system application (Star App) as a web-assisted learning media is the right choice because it does not require an installation process, large storage capacity, and is easy to access anytime and anywhere. Web-based learning media can also be used to improve student learning outcomes because there are no space and time limitations in accessing information, it is fast, more efficient, and up to date (Peprizal & Syah, 2020). In addition, through this application, students can practice the process of inputting incoming and outgoing mail data, carrying out the process of rediscovering archives, and carrying out the process of retaining archives. Not only does it train students' skills, the application is equipped with electronic archiving materials, so that students can also learn the theory of electronic archives before practicing them. Therefore, the electronic archive system application (Star App) can be used as a learning medium for class X students majoring in MPLB and can improve student learning outcomes and skills in implementing electronic archive management.

In accordance with previous research conducted by Setyani and Bukhori (2022) entitled Development of a Web-Assisted Electronic Archive System as a Learning Medium to Improve Students' Practical Skills (Setyani & Bukhori, 2022). The results of the study showed that the Web-Assisted Electronic Archive system was very feasible to use based on the results of the validation assessment from the material expert validator of 98.81% and the media expert validator of 97.71%. As the results of research conducted by Rizky and Bukhori (2021) entitled Website-Based Electronic Archiving Learning Media. The results of the study stated that this website-based electronic archiving learning media is suitable for use in electronic archiving learning activities (Rizky & Bukhori, 2021).

2. RESEARCH METHOD

This study uses the R&D (Research and Development) method with the ADDIE development model approach consisting of five stages: Analysis, Design, Development, Implementation, and Evaluation (Sugiyono, 2012, 2016, 2017). The resulting product is a web-based electronic archive system application (Star App), which is designed to support archiving learning for class X students majoring in Office Management and Business Services. Star App is equipped with features such as archiving materials, user login, incoming/outgoing mail agenda, and disposition functions to help students understand electronic archive management practically. The stages begin with analysis to identify learning needs and include performance, needs, and concept analysis. Furthermore, the design stage involves developing application menus such as archive recording and disposition. At the development stage, the application is made according to the design, validated by media and material experts, and improved based on suggestions. Implementation is carried out by testing the application to students to obtain responses and evaluations from users. The evaluation stage ensures that the application meets the expected learning objectives (Riduwan, 2007, 2015).

The trial was conducted on class X MPLB students of SMK IPEMS Surabaya, using experimental and control groups. Data were collected through interviews, expert validation sheets, and student response sheets. Validation involves material, media, and language experts to ensure the application is feasible to use. In addition, the effectiveness of the application is tested using the N-Gain method with a pretest and posttest to assess the increase in student competence after using the application. Evaluation uses a quantitative and qualitative approach through analysis of student response data and input from experts. Star App is designed to improve student skills in managing electronic archives. Student responses to the application are evaluated to determine the level of relevance, satisfaction, and effectiveness of the learning media. With a quasi-experimental design, the results show significant differences in student abilities between the experimental and control groups, proving the effectiveness of the application as a modern learning media (Maulana et al., 2020).

Research on the development of an electronic archive system application (Star App) for learning media for office management and business services majors uses qualitative and quantitative data analysis. Qualitative analysis is carried out through suggestions from expert validators to improve the application. Quantitative analysis involves validation by material, media, and language experts using a Likert scale to measure the feasibility of the application, with validation results ≥61% considered feasible (Riduwan, 2015; Sugiyono, 2016). Student responses are analyzed using the Guttman scale,

with interpretation of student responses based on percentages. The effectiveness of the application is measured through a pretest and posttest, with normality, homogeneity, and t-test tests to determine the significant effect of the application on student understanding (Wahyudi et al., 2022). The results of the effectiveness test were calculated using N-Gain, with the effectiveness criteria based on the percentage change in pretest-posttest scores.

3. RESULTS AND DISCUSSION

This research went through several stages starting with product validation, limited trials on 5 students which were then continued with trial stages involving 25 students of office management expertise competency in the experimental class at SMK IPIEMS. This study adopted the ADDIE model development procedure from Sugiyono (2017).

3.1 Analysis Stage

At the analysis stage in the ADDIE model, performance analysis and needs analysis were conducted to identify problems and needs in the learning process. Performance analysis was conducted through interviews with archiving subject teachers at SMK IPIEMS, which revealed that archiving learning was not optimal. The learning media currently used is based on Microsoft Access, which has many shortcomings, such as a long installation process, limited storage capacity, and slow data processing speed. This makes it difficult for students to operate the application and affects their learning outcomes. The interview results also showed that complicated and time-consuming learning media caused students to feel bored and had difficulty understanding the material. The learning media used so far does not support the demands of the 21st century, where technology that is easily accessible anytime and anywhere is needed to facilitate daily work. Based on the results of the performance analysis, the researcher decided to develop new learning media in the form of a web-based electronic archive storage application. This application aims to improve students' understanding and skills in managing electronic archives. It is hoped that this media can be more effective, efficient, and in accordance with the demands of the 21st century, and equipped with complete learning features, including electronic archive materials and features such as agenda books, incoming and outgoing letters, borrowing, and archive retention.

3.2 Design Stage

At the design stage, researchers designed learning media based on the results of previous analysis. The learning media chosen was a web-based electronic archive storage application. This is because the desktop application used previously required complicated installation and a long time to process data. By using a web-based application, students can access materials and practice storing archives electronically through any device, be it a computer, laptop, or smartphone. This application is expected to improve students' ability to manage electronic archives and make learning more interesting. Researchers also chose a web-based application format so that it can be accessed online, overcoming the limitations of the previously used desktop-based installation media. The main features of this application include learning materials, login, and how to use it. After logging in, students can practice using sub-menus that include recording agenda books, incoming and outgoing letters, borrowing, and archive retention. Researchers also designed a pretest-posttest test to measure the effectiveness of using this application in improving student understanding and learning outcomes. The initial design of the application includes a simple yet elegant interface design, with the use of bright blue and white colors and visual elements such as cartoon illustrations of books, laptops, and cellphones. The button and menu designs are designed to be easy to use and ensure optimal application performance. This application can be accessed through browsers such as Google Chrome and Mozilla Firefox on various devices. The development process begins with the preparation of application requirements and collaboration with a team of programmers to realize this interactive application, which aims to improve the quality of archiving learning in schools.

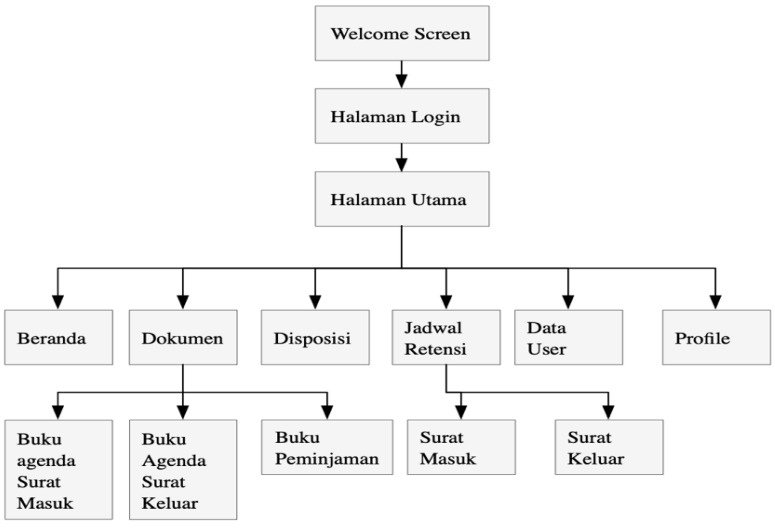

Fig. 1. Initial Product Design

3.3 Development Stage

The development process of the Electronic Archive System Application began in October 2024 with a focus on improving the design and optimizing product performance. This application includes important features such as administrative materials, as well as menus such as incoming and outgoing letters, agendas, and letter dispositions. In this development, an evaluation by a team of experts or validators was carried out to examine aspects of the material, media, and language. Based on input from the evaluation, researchers revised the application to make it more in line with the recommendations given. This improvement resulted in a comparison between the initial version of the interactive media and the updated version, ensuring an increase in its quality and usefulness. The application display is designed with an attractive and elegant design, with the use of light blue and white colors and a 3D cartoon logo. The welcome screen menu presents options for logging in, accessing materials, and viewing developer information. The login menu allows users to enter a username and password, while the home menu displays reports in table format that include incoming and outgoing agenda books, loan books, and dispositions. The edit and delete letter data feature is also available on this menu, providing flexibility for users to manage archive information efficiently. The document menu includes a sub-menu for incoming and outgoing mail diary, borrowing, and disposition designed with detailed tables that facilitate data recording and management. After the application implementation is complete, the next stage is validation by experts. Material validation was carried out by Dr. Siti Sri Wulandari, S.Pd., M.Pd, a lecturer in the Master of Economic Education study program, to ensure the suitability of the material presented in the application with the objectives of archiving learning at SMK IPIEMS Surabaya. The results of this material validation will be an important reference to ensure that the application can be used effectively as a medium for archiving learning. Every feedback from experts will be considered and used as a basis for improving the quality of the application, so that it can better support an optimal learning process.

Table 1 Material Expert Validation Test Results

No.	Aspect	Criteria	Indicator	Mark	Percentage	Information
1	Learning	Archival Theory	Conformity of the program concept with archival theory	4	80%	Good
			The suitability of the columns for recording incoming and outgoing letters is in accordance with archival theory	4	80%	Good
			Conformity of the incoming letter disposition column with archival theory	4	80%	Good
			Conformity of procedures for recording incoming and outgoing letters in accordance with archival theory	4	80%	Good
			Conformity of incoming letter disposition procedures with archival theory	4	80%	Good
2	Archiving Procedures	Letter Recording	There are columns recording letters in the program	4	80%	Good
			Ease of filling letters on the program	4	80%	Good
			Readability of letter recording output information	4	80%	Good
		Disposition of Letters	There is a letter disposition column in the program	5	100%	Very good
			Ease of filling in dispositions in the program	5	100%	Very good
			Readability of letter disposition output information	5	100%	Very good
		Letter Deletion	There is a letter deletion menu	5	100%	Very good
Total				52	86%	Very good

Based on the assessment results listed in Table, the scoring by the validator on the Star App application shows variations covering two aspects with 12 indicators, with the scores given ranging from 4 to 5, resulting in a total score of 52 out of a maximum score of 60. To assess the feasibility of the material, the percentage of material validity is calculated using the formula: Percentage (%) = (Total Score / Highest Score) x 100, which produces a percentage of 86%. This value indicates that the material in the application has met the feasibility criteria and can be used in learning. In addition, the validation of language experts carried out by Andik Yuliyanto, S.S., M.Si, aims to measure the suitability of the use of language in the application, which is also an important part of ensuring that the application is effective as a learning medium at SMK IPIEMS Surabaya.

Table 2 Linguist Expert Validation Test Results

No	Aspect	Indicator	Mark	Percentage	Information
1	grains	Accuracy of sentence structure	5	100%	Very good
		Standardity of terms	4	80%	Good
2	Communicative	Students' understanding of the message	5	100%	Very good
		Effective and efficient use of language	5	100%	Very good
3	Dialogic and Interactive	Use of dialogue or text that is interesting and leads to understanding of concepts	5	100%	Very good
		Creating an interactive learning process	5	100%	Very good
4	Conformity to Language Rules	Grammatical accuracy is in accordance with the KBBI	4	80%	Good
		Spelling accuracy	5	100%	Very good
5	Use of Terms, Symbols, or emblems	Appropriate use of terms	5	100%	Very good
		Appropriate use of symbols/symbols	4	80%	Very good
		Total	47	94%	Very good

Based on the assessment results listed in table, the scores given by the validator on the Star App application vary, with a range of values between 4 and 5, resulting in a total score of 47 out of a maximum score of 50. To measure the feasibility of the language in this application, the percentage of validity is calculated using the formula: Percentage (%) = (Total score / Highest Score) x 100, which produces a value of 94%. Thus, the validity of the language in this electronic archive application reaches 94%, indicating that this application meets the criteria and is suitable for use in the teaching and learning process. In addition, the media expert validation carried out by Dr. Fajar Arianto, S.Pd., M.Pd., a lecturer in the Educational Technology study program, aims to evaluate the suitability of the media used in the Star App application as a learning medium for archiving at SMK IPIEMS Surabaya, with the validation results still to be explained further.

Table 3 Media Validation Test Results

No	Aspect	Criteria	Indicator	Mark	Percentage	Information
1	Program	Program View	Program display	5	100%	Very good
			Background program	5	100%	Very good
			Accurate color selection	5	100%	Very good
			Accuracy of font selection	5	100%	Very good
			Accurate selection of font size	5	100%	Very good
		Navigation Buttons	Display buttons (icons)	5	100%	Very good
			Accuracy of button (icon) color selection	5	100%	Very good
			The button (icon) works	5	100%	Very good
		Ease of Program Operation	Instructions for using the program	5	100%	Very good
			Placement of buttons (icons) for access	5	100%	Very good
		User Interaction with the Program	Process Log In program	5	100%	Very good
			Ease of operation	5	100%	Very good
			Program attractiveness	5	100%	Very good
2	Program Content	Picture	Selection of images in the program	5	100%	Very good
			Image quality in the program	5	100%	Very good
			Readability of archive upload results	5	100%	Very good
		Animation	Transition effects Log In program	5	100%	Very good
			Display transition effects program	5	100%	Very good
		Text	Readability of text in the program	5	100%	Very good
			Clarity of text in the program	5	100%	Very good

Based on the assessment results listed in Table, the scoring by the validator shows quite diverse variations, consisting of two aspects with a total of 20 indicators. The validator gives a maximum score of 5 for each indicator, with a total score reaching 100 from the highest score which is also 100. To determine the feasibility of the Star App application media, the percentage of feasibility is calculated using the formula: Percentage (%) = (Total score / Highest score) x 100, which produces a value of 100%. These results indicate that the Star App application obtained a feasibility percentage of 100% from language experts, stating that the application meets the criteria and is suitable for use in the learning process.

3.4 Implementation Stage

The implementation stage is carried out after the learning media product has been assessed by material, media and language validators who show scores to determine the level of validity and feasibility. Implementation was carried out through small and large group trials involving students in 2 Class X MPLB with 26 students in each class with the aim of finding out the effectiveness of learning using the Star App. The following are the results of the pretest and posttest from the experimental class using StarApp and the Control Class.

Table 4 Pretest and Post Test Results

Experiment				Control			
Student	**Pretest**	**Student**	**Posttest**	**Student**	**Pretest**	**Student**	**Posttest**
A	30	a	90	aa	40	aa	80
b	55	b	90	bb	40	bb	85
c	40	c	85	cc	30	cc	80
d	30	d	95	dd	30	dd	70
and	30	and	85	yes	40	yes	75
f	40	f	90	ff	50	ff	75
g	25	g	95	gg	20	gg	75
h	25	h	90	hh	20	hh	70
i	20	i	95	ii	30	ii	80
j	10	j	90	jj	40	jj	80
k	30	k	80	kk	40	kk	85
l	40	l	85	ll	30	ll	85
m	45	m	90	mm	20	mm	90
n	30	n	75	nn	10	nn	70
the	35	the	80	and	10	and	70
p	40	p	90	pp	10	pp	70
q	40	q	85	qq	40	qq	75
r	45	r	80	rr	45	rr	90
s	30	s	70	ss	30	ss	75
t	20	t	70	tt	20	tt	75
in	10	in	75	he	20	he	80
v	25	v	75	vv	25	vv	75
In	40	In	90	ww	30	ww	70
x	30	x	95	xx	30	xx	85
and	35	and	95	yy	50	yy	80
With	50	With	90	zz	50	zz	80

Based on the data obtained by researchers in table 4.4, it shows an increase in student learning outcomes from pretest to posttest in the experimental class and control class. Researchers used 4 tests with the aim of finding out the distribution of the data obtained as well as comparing learning outcomes that did not use media with results that used learning media. Below is a description of the researcher's method of analyzing the pretest and posttest results.

The results of the pretest and posttest in the experimental and control classes were collected for the testing phase of the research hypothesis. The reference for the hypothesis lies in the formulation of the problem of media effectiveness. Before carrying out analysis regarding this matter, researchers need to ensure that the research data obtained is normally distributed. Through the normality test, one of the conditions for data to be declared good is if it is normally distributed or close to normal. The researcher adopted the basis for determining normal data through the Kolmogorov-Smirnov and Shapiro Wilk tests with the help of IBM SPSS Statistics version 26. The following is a description of the data processing results in the normality test in the following table:

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Kelas	Statistic	df	Sig.	Statistic	df	Sig.
Hasil Belajar Kearsipan	Pretest Eksperiment	.135	26	.200*	.963	26	.448
	Posttest Eksperiment	.244	26	.000	.884	26	.007
	Pretest Kontrol	.160	26	.087	.932	26	.085
	Posttest Kontrol	.179	26	.031	.906	26	.021

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

a. Lilliefors Significance Correction

Fig. 2. Pretest – Posttest Normality Test Results

The results of the normality test using Kolmogorov-Smirnov and Shapiro-Wilk show that the data in the Experimental Pretest and Control Pretest have a significance value greater than 0.05, both in Kolmogorov-Smirnov (0.200 and 0.087) and Shapiro-Wilk (0.448 and 0.085). This indicates that the data in the two groups is normally distributed. In contrast, in the Experimental Posttest and Control Posttest, the significance values in the Kolmogorov-Smirnov were 0.000 and 0.031 respectively, while in the Shapiro-Wilk they were 0.007 and 0.021, which were all smaller than 0.05. Thus, the data on the Experimental Posttest and Control Posttest are not normally distributed. Therefore, further statistical analysis needs to consider the use of parametric methods for data that is normally distributed and non-parametric methods for data that is not normally distributed. The homogeneity of variances between the control and experimental classes was tested using Levene's test in the IBM SPSS Statistics version 26 application, with a significance level set at 5%. The decision-making guidelines are as follows: if the significance value is less than 0.05, the data is considered not homogeneous, and if the significance value is greater than 0.05, the data is considered homogeneous. After processing the data from both classes, the output or results can be seen in the image below, which will help determine whether the variances between the two groups are homogenous or not.

Test of Homogeneity of Variance

		Levene Statistic	df1	df2	Sig.
Hasil Belajar Kearsipan	Based on Mean	2.550	1	102	.113
	Based on Median	2.055	1	102	.155
	Based on Median and with adjusted df	2.055	1	100.774	.155
	Based on trimmed mean	2.541	1	102	.114

Fig. 3. Normality Test Results for Experimental Class and Control Class

The homogeneity test results show that the significance value for all testing methods (Based on Mean, Based on Median, Based on Median and with adjusted df, and Based on trimmed mean) is above 0.05, namely 0.113, 0.155, 0.155 respectively. , and 0.114. This indicates that the variance between data groups is homogeneous, so the assumption of homogeneity of variance is met. Thus, parametric statistical analysis which requires the assumption of homogeneity of variance can be continued. The independent T-Test was carried out to see whether or not there was a difference in the scores from the posttest results of the experimental class students and the control class using the SPSS application. From the results of the T Test, the following values were obtained:

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Hasil Belajar Kearsipan	Equal variances assumed	1.536	.221	4.026	50	.000	7.885	1.959	3.951	11.818
	Equal variances not assumed			4.026	47.467	.000	7.885	1.959	3.946	11.824

Fig. 4. Independent T Test

From the test results, a Sig.(2-Tailed) of 0.000 <0.05 was obtained, so it can be concluded that there is a difference in the average learning outcomes of experimental class and control class students which can be seen in Figure 4.22 below:

Group Statistics

	Kelas	N	Mean	Std. Deviation	Std. Error Mean
Hasil Belajar Kearsipan	Kelas Ekserimen	26	85.77	7.835	1.537
	Kelas Kontrol	26	77.88	6.192	1.214

Fig. 5. Group Statistics T Test

From Figure 4.22, it can be seen that the average score for the experimental class is 85.77, while the control class is 77.88, which shows that H1: Electronic Archives Application Learning Media (Star App) is declared effective in increasing students' understanding of electronic archives in subjects. archives. After carrying out the T test, an N-Gain test was carried out to determine the effectiveness of using the Star APP media application in archives lessons based on pretest and posttest scores. N-Gain testing uses SPSS with the following percentage results:

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
NGain_Score	26	.57	.94	.7872	.10681
NGain_Persent	26	57.14	93.75	78.7175	10.68086
Valid N (listwise)	26				

Fig. 6. N-Gain Test Results

Based on the results of the N-Gain test, a score of 78% was obtained which can be categorized as saying that the use of Star App learning media in archives lessons can be categorized as effective.

3.5 Evaluation Stage

The evaluation stage in this R&D model is carried out at the end of each analysis, design, development, implementation & evaluation stage. At each stage in the R&D model, researchers carry out evaluations with the aim of minimizing errors and discrepancies both in terms of needs analysis, product design, and content of electronic archival learning media. Based on the evaluation results of its use using pretest and posttest, this application can be declared effective as a learning medium for archival subjects.

3.6 Final Product Review

Star App learning media is a product developed in this research. The development product has gone through a series of research stages that refer to the R&D development model. The initial stage is the analysis and application design stage. After the initial product has been developed, the next stage is to review and validate the product by a team of material, media and language experts. Data obtained from the development stage went through analysis and validation carried out by material experts once, media experts once, and language experts once. The results of this process are carried out to obtain an assessment regarding the quality of the learning media products that have been developed. The assessments and suggestions provided by the validator will be used as a reference for revising or improving the product. After the product revision is complete, a product trial phase will be carried out by the target group, namely students. The analysis that has been carried out on the product is considered to be of good quality and very suitable for use in lessons. These results are supported by assessment data carried out by the validator and student responses. In general, products have several characteristics, including:

1. The Star App product has archival materials that users can study at any time.
2. StarApp is equipped with correspondence processes with steps that are appropriate to archival material.

4. CONCLUSION

Based on the results of the study, it can be concluded that the electronic archiving system application was successfully developed using the R&D method as a learning media for archiving. This application received a high feasibility score from experts, with a validation score of 86% for material, 94% for language, and 100% for media. In addition, the effectiveness test of the application using N-Gain showed a result of 78%, which indicates that StarApp is an effective learning media. For future improvements, it is recommended that this learning media be developed by adding material in the form of video tutorials on usage to improve user understanding. In addition, the results of the posttest scores from the experimental class can be used as a reference for developing similar learning media for other subjects in schools.

REFERENCES

Hamdani, A. (2020). Keterampilan abad 21 dan implementasinya di sekolah dasar. *Jurnal Penelitian Pendidikan*, *November*.

Hasan, M. M. D. H. K. T. (2021). Media Pembelajaran. In *Tahta Media Group* (Issue Mei).

Jejen, L. (2021). Peran Teknologi Informasi Dalam Peningkatan Kinerja Sumber Daya Manusia. *Forum Ekonomi*, *23*(1), 1–11.

Maulana, I., Budiman, H., & Andriani, S. (2020). E-modul flipbook dengan pendekatan situation Based Learning pada Materi Sistem Persamaan Linear Dua Variabel. *Prosiding: Seminar Nasional Matematika Dan Pendidikan Matematika 2020 UIN Raden Intan Lampung*, 41–50.

Nurfadhillah, S., Ningsih, D. A., Ramadhania, P. R., & Sifa, U. N. (2021). Peranan Media Pembelajaran Dalam Meningkatkan Minat Belajar Siswa SD Negeri Kohod III. *Pensa: Jurnal Pendidikan Dan Ilmu Sosial*, *3*(2), 243–255.

Peprizal, & Syah, N. (2020). Pengembangan Media Pembelajaran Berbasis Web Pada Mata Kuliah Fisika Modern. *Jurnal Ilmiah Pendidikan Dan Pembelajaran*, *4*, 455–467.

Putra, W. I., & Nelisa, M. (2020). Pengelolaan Arsip Elektronik Di Unit Kearsipan PT Semen Padang. *Ilmu Informasi Perpustakaan Dan Kearsipan*, *8*(2), 39–47.

Riduwan. (2007). *Skala Pengukuran Variabel-Variabel Penelitian*. Alfabeta.

Riduwan. (2015). *Skala Pengukuran Variabel Penelitian*. Alfabeta.

Rizky, A. G., & Bukhori, I. (2021). Media pembelajaran kearsipan elektronik berbasis website. *Jurnal Ekonomi, Bisnis Dan Pendidikan*, *1*(5), 479–487. https://doi.org/10.17977/um066v1i52021p479-487

Setyani, E., & Bukhori, I. (2022). Pengembangan Sistem Arsip Elektronik Berbantuan Web sebagai Media Pembelajaran untuk Meningkatkan Keterampilan Pratikum Peserta Didik. *ECODUCATION Economics & Education Journal*, *4*(2), 249–263.

Sugiyono. (2012). *Metode Penelitian Bisnis*. Alfabeta.

Sugiyono. (2016). *Metode Penelitian Pendidikan*. Alfabeta.

Sugiyono. (2017). *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*. Alfabeta.

Wahyudi, E. C., Hadi Wijoyo, S., & Afirianto, T. (2022). Pengembangan Media Pembelajaran Interaktif menggunakan Model Pengembangan APPED pada Mata Pelajaran Dasar Desain Grafis untuk Siswa Kelas X Multimedia di SMK Negeri 1 Pasuruan. *Jurnal Pengembangan Teknologi Informasi Dan Ilmu Komputer*, *6*(9), 4500–4507.