

# THE DEVELOPMENT OF DIGITAL LEARNING BASED ON MICROSOFT ACCESS SUBJECTS ARCHIVES TO IMPROVE STUDENT LEARNING OUTCOMES IN OFFICE ADMINISTRATION AT VOCATIONAL HIGH SCHOOL 3 SURAKARTA

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## Abstract

The purpose of this study was to: 1) to determine the digital media-based learning Microsoft Access on the subjects of archives in an effort to improve the learning outcomes of students office administration SMK Negeri 3 Surakarta. 2) Determine the effectiveness of digital media-based learning Microsoft Access on the subjects of archives in an effort to improve the learning outcomes of students office administration SMK Negeri 3 Surakarta. This study is a research and development (R & D). This media development Hannafin and Peck. The subject of limited testing done for the nine students of class X AP and large scale trials conducted for thirty students of class X AP 1 in SMK Negeri 3 Surakarta. The analysis technique used descriptive qualitative and quantitative. The results showed that: (1) the media developed already worthy and qualified to be used. (2) effectiveness is find that  $t_{\text{statistic}} > t_{\text{table}} = (3.26 > 2.00)$ , then  $H_0$  is rejected, it means that the two groups have different learning achievement scores. Results posttest between the experimental class (using the media developed) with a control class (do not use the media developed) shows that the average value obtained by the experimental class is 80.59, the average value is higher than the control class 77, 97. The conclusion of this research is the development of digital media-based learning Microsoft Access considered effective in improving student learning outcomes office administration SMK Negeri 3 Surakarta.

**Keywords:** Development, Digital Learning, Archive, Office Administration, Innovation in Education.

## Introduction

Education is one way of creating high-quality human resource. It is the high-quality human resource that will build a state thereby improving a nation's quality. The development of science and technology, in addition to affecting the industrial world, affects the education realm in Indonesia. Technology exerts positive effect not only on social life but also on education. Because technology becomes more prevalent in education organization, the educators are expected to utilize digital tool to support teaching learning in the classroom (Akyuz & Yavuz, 2015; Gan, Menkhoff & Smith, 2015; All, Nunez, & Looy, 2015).

It can be seen from the infrastructures and learning media a teacher uses in delivering material to the students. Technology advance requires a teacher, as an educator, to keep innovating in creating some learning media that can support the students in learning the learning material, either theoretically or practically (Kingsley, 2007; Norma& Furnes, 2015). Learning media use, in addition to aiming to facilitate the transfer of material from teachers to the students, can improve the students' willingness and interest in a subject.

Learning is not an end but a process to achieve it (Hamalik, 2011: 29). The involvement of learning media in learning process is expected to affect the learning the students experience and the objective to be achieved in the learning. The learning media use in the learning process can also contribute to optimizing the achievement of learning objective.

Archiving learning still emphasizing formerly on the conventional archive organizing practice with filling cabinet now turns to digital media/virtual archive. The development of archiving world in computerized era is characterized with the computerized storage system or called Electronic Archive (E-Archive). Archive is a very valuable part of our cultural heritage because it represents an individual's activity traces, either physically or in juridical manner, in their business course (Ferro and Silvello, 2013;Cincinelli, 2016; Tang, 2015; Smith, 2015).

Vocational Middle School (thereafter called SMK) prepared to be the ready-for-working labor is expected to equip the students with the specialty competency studied and corresponding to work realm in the learning process. Office Administration specialty competency has archiving subject in the curriculum 2013, into which the digitally archive storage material is included. The learning outcome of archiving subject has not been optimal yet.

One solution to improve the students' absorbability in archiving learning emphasizing on the ability of applying basic archiving concept to create the good bookkeeping process is to design the learning media development and to improve thinking ability in education process is a set of skills that can be developed through learning process (Rosalin, 2008). Teacher in learning process should connect and integrate thinking practice to the mastery of knowledge (substance), because knowledge and thinking can be complementary each other in subsequent thinking development.

The use of Microsoft Access is intended to organize the archive systematically. Yuliana (2007: 5) stated that Microsoft Access is one of Microsoft Office Suit created and developed to deal with a database. Microsoft Access, according to Westriningsih (2010: 234), is one of Microsoft Office's applications developed specifically for the database programming purpose. Microsoft Access is a database program used to process a variety of data. Microsoft Access has some components supporting the database development: table, field, query, form, and necessary data. Westriningsih (2010: 234) suggested that Microsoft Access has the following components: (1) table where a collection of similar data is stored, (2) query serving as the language to manipulate the database; (3) form serving to enter and to change data or information existing in a database using form display; and (4) report serving to display and to print data or information.

The objectives to be achieved in this research are: (1) to find out the Microsoft Access-based digital learning media in archiving subject in the attempt of improving the learning outcomes of Office Administration students in SMK Negeri 3 Surakarta, and (2) to find out the effectiveness of Microsoft Access-based digital learning media

in archiving subject in the attempt of improving the learning outcomes of Office Administration students in SMK Negeri 3 Surakarta.

The method used in this research was Research and Development. Borg and Gall (2007: 589) said that Research and Development is an industry based development, which the findings of research are used to design new product and procedures, which then are systematically field tested, evaluated and refined until they meet specified criteria of effectiveness, quality, or similar standards. United Nation conference On Trade and Development (UNCTAD) (2005:1) explained that Research and Development consisted of four types of activity: basic research, applied research, product development, and development process.

The development model to which this research refers is Hannafin and Peck's development design. Hannafin and Peck's development design is one of product-oriented learning design models. Product-oriented model is learning design model to produce a product, usually learning media (Afandi and Badarudin, 2011:22). Hannafin and Peck (Tegeh, Jampel and Pudjawan, 2014:1) stated that the learning design consists of three phases: Need Assessment, Design, and Development and Implementation. Techniques of collecting data used were interview, field observation, questionnaire, and learning outcome test.

### **Finding and Discussion**

The development of Microsoft Access-based digital learning media has been conducted by the author referring to Hannafin and Peck's product development. The procedure of developing this Microsoft Access-based digital learning media consists of three phases: need assessment, design, and development and implementation.

#### ***Need Assessment***

The development of Microsoft Access-based digital learning media started with need assessment constituting the first step in developing a media or product. Need assessment is the basis of a media's development. The need assessment is conducted to obtain data supporting the development of media yielded corresponding to the media users' need. The research and development trial was conducted in the 10<sup>th</sup> AP1 and 10<sup>th</sup> AP 2 grades of SMK Negeri 3 Surakarta. Considering the result of observation in need assessment phase, it can be concluded that teachers found difficulty in delivering the learning material. The subject identifies the organization and the basic problem of archiving and the position of archiving in the organization. Teachers often found difficulties in developing learning media so that they give visual example less maximally to the students. For that reasons, a learning media should be development that is adjusted with the learning material in Office Administration Specialty of SMK Negeri 3 Surakarta. It is supported with adequate infrastructures such as LCD Projector, laptop or computer that can be used easily by the students. This media can be used for learning media independently by the students. Through the development of digital learning media, the students are expected to master the material better and to be more motivated in learning so that their learning outcome improves.

#### ***Design***

The design phase built on the result of observation on need analysis assessment constituting the initial step of preparing to produce a learning media. The author prepared storyboard constituting the general design. Design and storyboard prepared was then consulted with material and media expert. Revision and improvement would be conducted when the design has not been suitable. If the design has been considered as good, the media development process would go up to the next stage, *development*

(product development). The product development refers to the prepared design and storyboard. The structure in the Microsoft Access-based digital learning media is as follows:

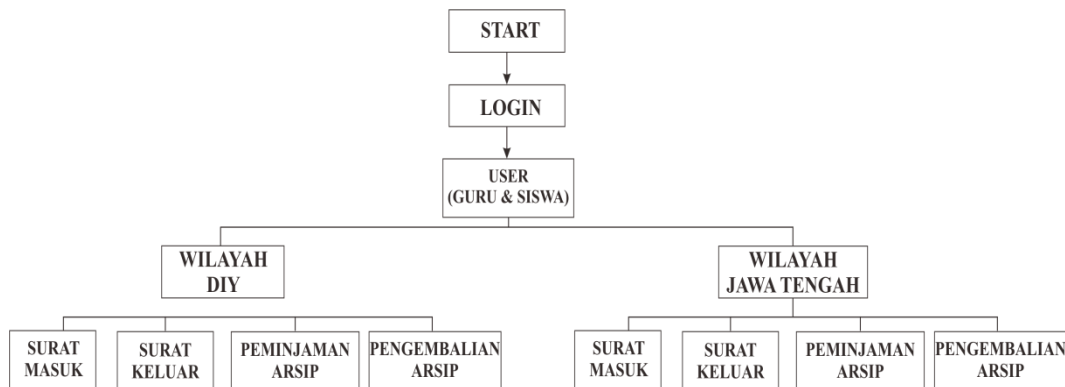


Figure 1. Structure of Microsoft Access-based digital learning media in Archiving Subject

### ***Development and Implementation***

In this phase, the production activity is conducted to develop the Microsoft Access-based digital learning media. The learning media was developed with Microsoft Office 2010 software help. In developing this Microsoft Access-based digital learning media, producing media means to change the script into archiving system in the form of digital learning media.

### ***Digital Learning Media Production***

In this digital learning media production stage, the storyboard is converted into a media containing text and some menus necessary in archiving system consisting of in-mail, out-mail, archiving borrowing and archive return. The procedure in running the Microsoft Access-based digital learning media is as follows: the users (the students) should log in first by filling in the user name and password. The followings are some displays existing in Microsoft Access-based digital learning media.



Figure 2. Display of Menu "Login"



Figure 3. Display of Menu “E-Archive”



Figure 4. Display of Menu “Archive area”

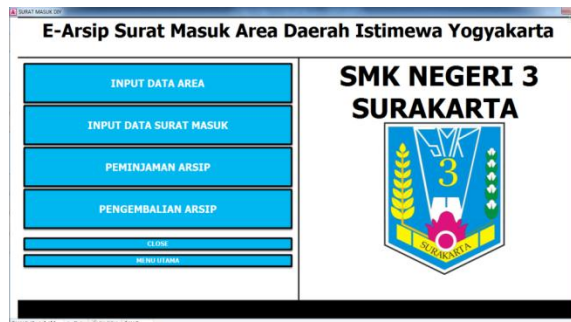


Figure 5. Display of Menu “In-mail”

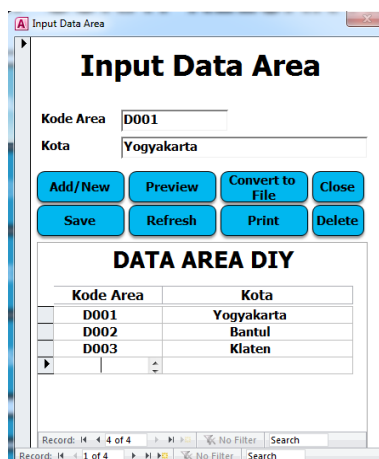


Figure 6. Display of Menu “Area Data Input”

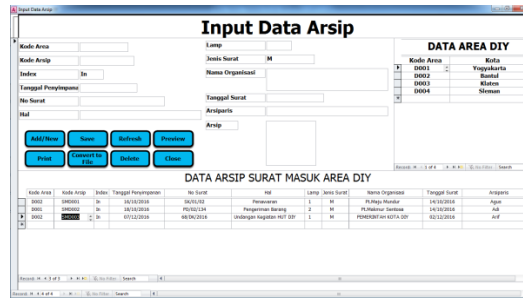


Figure 7. Display of Menu “Archive Input Data”

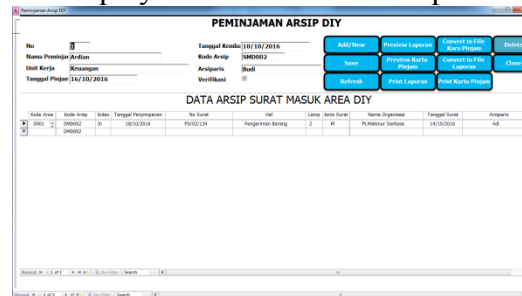


Figure 4.8. Display of Menu “Archive Borrowing”

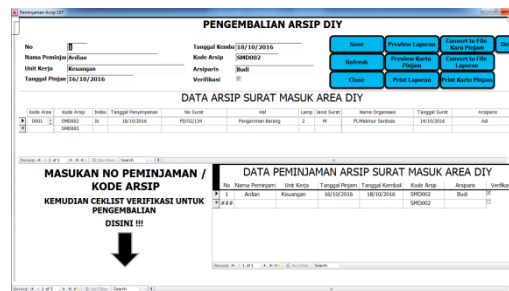


Figure 4.9. Display of Menu “Archive Return”

### Digital Learning Media Post-Production

This stage is the one stating that Microsoft Access-based digital learning has been completed, to be consulted further with material and media experts along with the assessment and inputs given. It is conducted to find out the advantage and disadvantage of basic concept prepared. Consultation with media and material experts is conducted corresponding to the revision or input. After revision has been conducted, it is followed with the trials with the students.

### Discussion

Microsoft Access-based digital learning in archiving subject is started with need assessment stage. The development model used is Hannafin and Peck’s learning product development model in Tegeh, Jampel and Pudjawan (2014: 1) consisting of Need Assessment, Design, and Development and Implementation. In the first stage, the analysis consists of two steps: library study and need assessment.

In the first stage, the author conducted an analysis on the problem with the development of Microsoft Access-based digital learning media, by conducting observation and interview with the teacher of archiving subject. Having identified the problems in the field, the objective of Microsoft Access-based digital learning media development was set out. Considering the result of field study and analysis, it can be found that teachers found difficulty in delivering the material in archiving subject. Teachers found difficulty as well in preparing the learning media so that they gave the

visual example to the students difficultly. In addition, teachers explain the material less optimally in the class so that the subject cannot be received well.

The second stage is to determine the coverage of database content, that is, the development of material in Microsoft Access-based digital learning media based on the material need analysis. The next stage is design. In this stage, program structure framework and storyboard are developed. This program structure and storyboard development is intended to design the product including the product appearance and the content of Microsoft Access-based digital learning media. The subsequent stage is prototyping, that is, to develop product in small scale as the initial product.

During the trial, the weaknesses to be corrected and the users' unfulfilled wish. After the initial product has been developed, the next stage is product testing. Product assessment is conducted in two stages: alpha test and beta test. Alpha test is the validation made by media and material experts. Meanwhile beta test is the assessment conducted by the users, in this case the 10 graders of Office Administration Specialty in SMK Negeri 3 Surakarta.

The third stage is development and implementation started with product validation by material and media experts, followed with the small group evaluation test. Validation, according to Daryanto (2013: 22) is the process to examine the compatibility of media to the competency becoming the target of learning. Implementation is the field test in which there are two class groups (experiment and control). Experiment group is the group of students using digital learning media, while control group is the students using textbook learning material. The product effectiveness test is conducted to obtain a feasible and high-quality product from material and media content aspect itself. After the product has been considered as feasible, the learning media can be used in the archiving subject. Product feasibility analysis is obtained from the data of questionnaire/evaluation sheet from material expert, media expert, and product trial questionnaire distributed to the students, while the effectiveness of product is obtained from the result of students' achievement test.

Considering the feasibility criteria assessed by the media expert, the Microsoft Access-based digital learning media obtains mean score of 4.4 (very good), while based on that by material expert, it obtains the score of 4.5 (very good), and based on that by practitioners, it obtains the mean score of 4.7 (very good).

Considering t-test (Independent Sample Test) in pretest for experiment and control classes, it can be found that the significance level of t-test is 0.296. The significance level is higher than 0.05 meaning that  $H_0$  is supported and  $t_{\text{statistic}}$  value is  $1.053 < t_{\text{table}} 2.00$ . It indicates that there is no significant difference of mean learning outcome score between the students in experiment class and those in control class during pretest; then, both experiment and control classes are treated, in which experiment class are treated using Microsoft Access-based digital learning media and control class is treated using textbook available in the school. It means that the experiment class is treated with the learning media developed and the control class is not treated using such the learning media.

The result of posttest shows that the mean posttest of experiment class is 80.59 and that of control class is 77.97. Based on the result of assessment, the score obtained by the experiment class is higher than that obtained by the class control. The score obtained by the experiment class before using Microsoft Access-based digital learning media is 69.26 and after the treatment using Microsoft Access-based digital learning media, the posttest score increases to 80.59. The increase in the learning outcome score for archiving subject before (pretest) and after (posttest) using Microsoft Access-based digital learning media shows that the Microsoft Access-based digital learning

media improves the students' learning outcome effectively. It is supported by the research conducted by Hariyati (2014: 14) suggesting that based on the t-test,  $H_0$  is not supported and  $H_1$  is supported, meaning that there is a significant effect of learning media use on the students' learning outcome in Integrated Social Science learning in SMP 12 Palu. It can be seen from the coefficient of correlation of 0.797, belonging to strong category. Furthermore, the result of study conducted by Pao-Nan Chou, Chi-Cheng Chang, and Pei-Fen Lu (2015:81) found that "the benefit of media in the learning process is teaching material will have more obvious meaning so that it can be understood by the students and enables the students to master better the objective of learning.

Considering the elaboration above, it can be seen that the learning media use is the very important factor to improve the students' learning outcome in learning process, because learning media is a very supporting means of developing an individual's knowledge, particularly in learning process at school. Thus, the school management should pay attention to and provide the learning media completely to make the learning process running effectively in the classroom, because the students will be more motivated when the material is delivered with direct practice. In addition, the material is more understandable so that the students can answer the questions in both daily quiz and semester test.

### **Conclusions**

Considering the result of research and development conducted, the following conclusions can be drawn:

The development of Microsoft Access-based digital learning media is conducted using Hannafin and Peck's development model. The Microsoft Access-based digital learning media developed is considered as feasible after having passed through the feasibility test conducted by media expert, media expert and practitioner. The feasibility of Microsoft Access-based digital learning media obtains scores of 4.7 (very good) from media expert, 4.5 (very good) from material expert, and 4.7 (very good) from practitioner. Considering the validation made by the experts, it can be concluded that the Microsoft Access-based digital learning media is feasible to use in learning activity to improve the students' learning outcome. The Microsoft Access-based digital learning media developed gets positive response from the students, as supported by the result of feasible test in small group trial with questionnaire obtaining the percentage of 84.9% with good criteria.

The Microsoft Access-based digital learning media improves the students' learning outcome effectively. The effectiveness of learning media is based on the result of pretest (before using Microsoft Access-based learning media) obtaining the score of 69.29 and posttest (after using Microsoft Access-based learning media) obtaining the score of 80.59 during field trial. The increase in the score of learning outcome for archiving subject before (pretest) and after (posttest) using the Microsoft Access-based learning media shows that the Microsoft Access-based learning media in the archiving subject can improve the students' learning outcome effectively. The Microsoft Access-based learning media improves the students' learning outcome effectively, as indicated with the statistic calculation at significance level of  $0.002 < 0.005$  during the effectiveness test between experiment and control classes showing the significant difference in which the experiment class has mean score of 80.59 and the control class has score of 77.97. Considering the mean score of learning outcome in posttest (after having been treated), it can be concluded that the score of experiment class is better than that of control class.



## References

- Afandi, Muhammad and Badarudin. (2011). *Perencanaan Pembelajaran*. Bandung: Alfabeta.
- Akyuz, Serhat & Yavuz, Fatih. (2015). Digital Learning in EFL Classrooms. *Procedia - Social and Behavioral Sciences* 197 ( 2015 ) 766 – 769.
- All, Anissa., Patricia Nunez Castellar, Elena., Van Looy, Jan. (2015). Assessing the effectiveness of digital game-based learning: Best practices. *Journal Science Direct Computers & Education* 92-93 (2016) 90-103.
- Borg, W. R. Dan Gall, M. D. (2007). *Education Research an Introduction*. New York: Longman.
- Chou, Pao-Nan., Chang, Chi-Cheng., Lu, Pei-Fen. (2015). Prezi versus PowerPoint: The effects of varied digital presentation tools on students' learning performance. *Journal ScientDirect Computers & Education*.
- Cincinelli, A., Martellini, T., Amorea, A., Dei, L., Marrazza, G., Carretti, E. et al. (2016). Measurement of volatile organic compounds (VOCs) in libraries and archives in Florence (Italy). *Journal Science of the Total Environment* 572 (2016) 333–339.
- Daryanto. (2010). *Media Pembelajaran*. Yogyakarta: Gava Media.
- Ferro, N., & Silvello, G. (2013). NESTOR: A formal model for digital archives. *Information Processing and Management An International Journal*. 49(1), 1206-1240.
- Gan, Benjamin., Menkhoff, Thomas., Smith, Ricard. (2015). Enhancing students' learning process through interactive digital media: New opportunities for collaborative learning. *Journal Science Direct Computers in Human Behavior* 51 (2015) 652–663.
- Hamalik, Oemar. (2011). *Proses Belajar Mengajar*. Jakarta: Bumi Aksara.
- Hariyati. (2014). Pengaruh Penggunaan Media Pembelajaran Terhadap Hasil Belajar Siswa Pada Mata Pelajaran IPS Terpadu Di SMP Negeri 12 Palu. *E- Journal Geo- Tadulako UNTAD*.
- Kingsley, K. V. (2007). Empower diverse learners with educational technology and digital media. *Intervention in school and clinic*, 43(1), 52-56.
- Norma, Elisabeth., Furnes, Bjarte. (2015). The relationship between metacognitive experiences and learning: Is there a difference between digital and non-digital study media?. *Journal Scient Direct Computers in Human Behavior* 54 (2016) 301-309.
- Rosalin, Elin. (2008). Guru Dalam Meningkatkan Daya Pikir Siswa. *Jurnal Manajemen Pendidikan UPI, No.01/Tahun IV*.
- Smith, Kevin G. (2016). Negotiating Community Literacy Practice: Public Memory Work and the Boston Marathon Bombing Digital Archive. *Journal Scient Direct Computers and Composition* 40 (2016) 115–130.
- Tang, X., Misztal, P.K., Nazaroff, W.W., Goldstein, A.H. (2015). Siloxanes are the most abundant Volatile Organic Compound emitted from engineering students in a classroom. *Environ. Sci. Technol. Lett.* 2 (11), 303–307 2015.

- Tegeh, I Made., Jampel, I Nyoman., Pudjawan, Ketut. (2014). *Model Penelitian Pengembangan*. Yogyakarta. Graha Ilmu.
- UNCTAD. (2005). Globalization of R & D and developing Countries: *Proceeding of the Expert Meeting Geneva 24-25 January 2005*. New York & Geneva United Nation Publication.
- Westriningsih. 2010. *Panduan Praktis Microsoft Office 2010*. Yogyakarta: Andi.
- Yuliana, Oviliani Yenty. 2007. *Langkah Jitu Pembuatan Aplikasi Database Microsoft Access*. Yogyakarta: Graha Ilmu.