

## DEVELOPMENT OF VIRTUAL REALITY AS A LEARNING MEDIA IN INACTIVE ARCHIVES MANAGEMENT COURSE

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### Abstract

*This research is motivated by the lack of development of learning media in the student learning process. Learning media that is already running is monotonous and tends to be boring. The purpose of this research is to develop learning media in the form of virtual reality technology. The benefits of this research are that it is hoped that students will gain real experience with the Manajemen Arsip Inaktif Course which is a Practical Course. The method used in this research is Research and Development, with stages from potentials and problems to producing the final product. The results of this study are learning media in the form of virtual reality. Applications generated using the Game Engine Unity can be run on a device in the form of an Android-based smartphone and can be integrated with a VR Headset. At the evaluation stage, it was found that the parameter evaluation results were obtained from material experts (90.69%), learning design experts (84.74%), and media experts (94.64%). From the results of the study, it was concluded that virtual reality-based learning media has very good feasibility to be applied to Manajemen Arsip Inaktif course at Universitas Terbuka.*

**Keywords:** *Learning Media, Practical Courses, Virtual Reality*

### INTRODUCTION

Universities have several obstacles in organizing learning that are sought and developed solutions. Lecturers at various universities are actively seeking effective teaching methods and trying to offer various ways to convey information in their learning process (Jia & Huang, 2016). As an educator, it is necessary to design program designs, curricula, and learning media in conducting learning in the classroom.

The online learning mechanism is usually implemented using video conferencing through an application or using an LMS (Learning Management System) so that teaching and learning activities can be more interactive. However, over time, interest or motivation in

learning decreases along with the boredom experienced due to the lack of physical contact that occurs, where in learning only sitting in front of a computer or laptop or smartphone screen to listen to the material (Sahulata, 2016). In this problem, it can be seen that technology seems to be the ruler that controls our lives every day.

The development of technology and progress in the field of visualization have now reached a new stage in terms of the reality of content that can be realized. Virtual Reality (VR) as one of the major contributions developed in the field of technology. Currently, visual devices are very promising for every user, where they can carry entertainment, information, simulation, and learning content. Interactive learning methods using this technology are still rarely used, especially in universities where understanding of information in learning must be deeper.

Universitas Terbuka (UT) is a university that implements an open and distance learning system that uses LMS and supporting applications in learning (Setijadi, 2005). This learning system has been proven effective in increasing the reach and equalization of opportunities for quality higher education for all Indonesian citizens. In accordance with the cultural values of the UT organization, namely KIIARA (Quality, Integrity, Innovation, Accessibility, Relevance, and Accountability), learning media using Virtual Reality applications can provide students with a more real experience of the courses they are taking.

Citing Law No. 12 of 2012 concerning Higher Education, the DIV Study Program in Archives and Information Records Management at Universitas Terbuka is required to have a curriculum composition of 40% theory and 60% practice. The DIV Study Program in Archives and Information Records Management of Universitas Terbuka has practical courses including Archives Publication and Exhibition, Archives Maintenance and Storage, Archives Supervision, Archives Reprography, Archives Manual, Static Archives Description and Arrangement, Archives Acquisition, Active Records Management, Inactive Records Management, Vital Archives Management, Archives Medical Records, Letter Management, Correspondence and Forms, Archives Assessment and Shrinkage, Electronic Archives Management, Archives Retention Schedule Design, Classification Scheme and Thesaurus Design, Automation in Archives, Audio-Visual Records Management, and Archives Access and Services. Based on the description above, it can be seen the potential that can be utilized from VR in improving students' understanding of information in lectures. Furthermore, in accordance with the background of the problems that have been described, the development of a VR application for practical courses in D-IV Archives at Universitas Terbuka will be designed.

## RESEARCH METHOD

The development research conducted by the researcher is oriented towards the Virtual Reality (VR) application of the Inactive Archives Management Course. The model used in this research is from Lee & Owen which consists of five development steps, including: (1) needs analysis, (2) design, (3) development, (4) implementation and (5) evaluation, however due to the researcher's limitations only stages 1-3 were carried out. The development procedure can be seen in the image below:

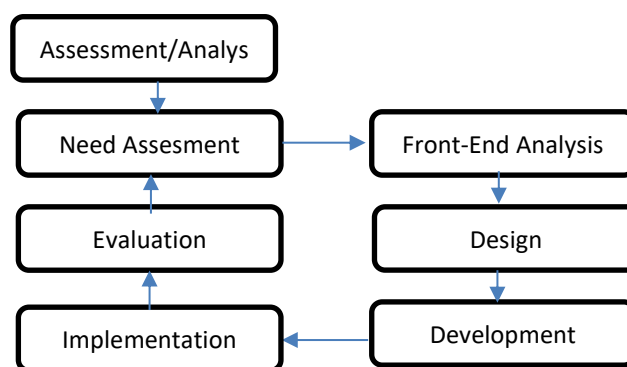


FIGURE 1. LEE & OWEN DEVELOPMENT STAGES.  
SOURCE (LEE & OWEN, 2004)

The purpose of this development is to produce a VR application for the Inactive Archives Management course that is feasible. This study uses the R&D (Research and Development) method using the Unity 2021 application. Contextually, Borg and Gall explain that R&D aims to develop and produce valid research products through cyclical and repetitive processes or steps such as field testing, product revisions until finally producing products that are in accordance with the stated objectives (Borg and Gall, 2003: 10-12). In another section, Borg and Gall state that research and development in the field of education is a research design that aims to be industry-based used to design new products or procedures to improve the quality of education through a field testing process to find effectiveness and standardization that has been determined academically and empirically.

## RESULT AND DISCUSSION

The first stage of VR application development, begins with the analysis stage consisting of needs analysis and front-end analysis which aims to determine the conditions in the field with the best conditions needed by students, while in the front-end analysis an analysis is carried out to find solutions to achieve the desired conditions. This analysis consists of audience analysis, technology analysis, and situation analysis. The results of the needs analysis in the DIV Study Program of Archives and Information Records Management obtained problems related to learning Inactive Archives Management so that it is necessary to develop a VR application in the Inactive Archives Management course because the Inactive Archives Management course is a course included in the practical course where there is 40% Theory and 60% practice, lack of visualization of the material in the module used by students so that students still find it difficult to practice, especially in the Inactive Archives Management course, android-based development because it is seen from students who are in the DIV Archives and Information Records Management which are very diverse (heterogeneous).

The second stage is design, at this stage a product framework is prepared consisting of making a storyboard and designing the appearance of the inactive archive management VR. In addition, at this stage, researchers begin to compile the material or content that will be provided on VR and create validation instruments. VR specifications are in electronic form in .apk and html formats which can be operated via Android and web browsers. The development of this VR

uses Unity 2021 software to compile material or content and WEB 2 APK Builder to convert it into an Android-based application.

The third stage is development. VR development is first carried out by creating a storyboard, then selecting media that matches the expected product specifications both in terms of visuals and audio that support it until it produces a product in the form of a VR for the Inactive Archive Management course. The appearance of the development stages can be seen as follows:

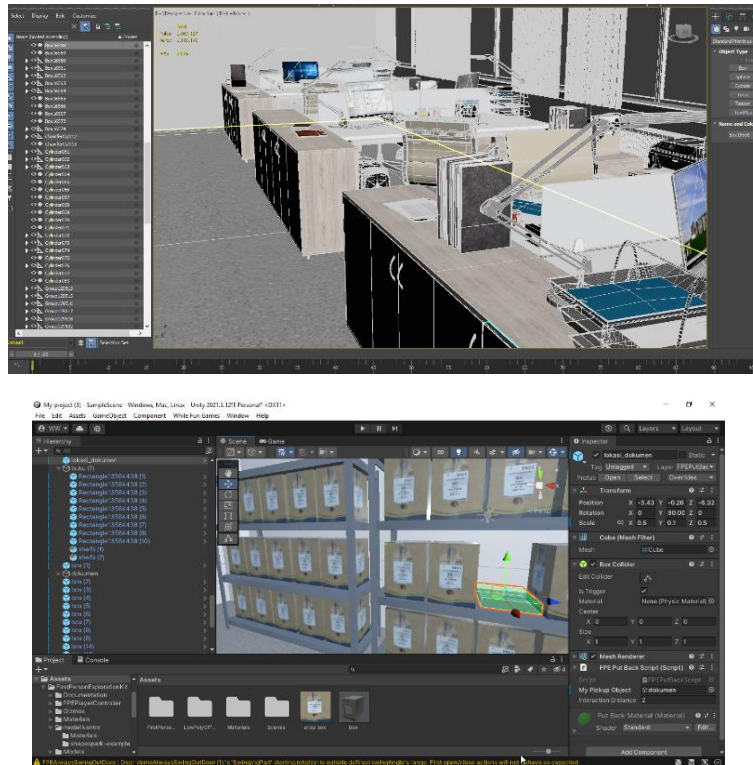
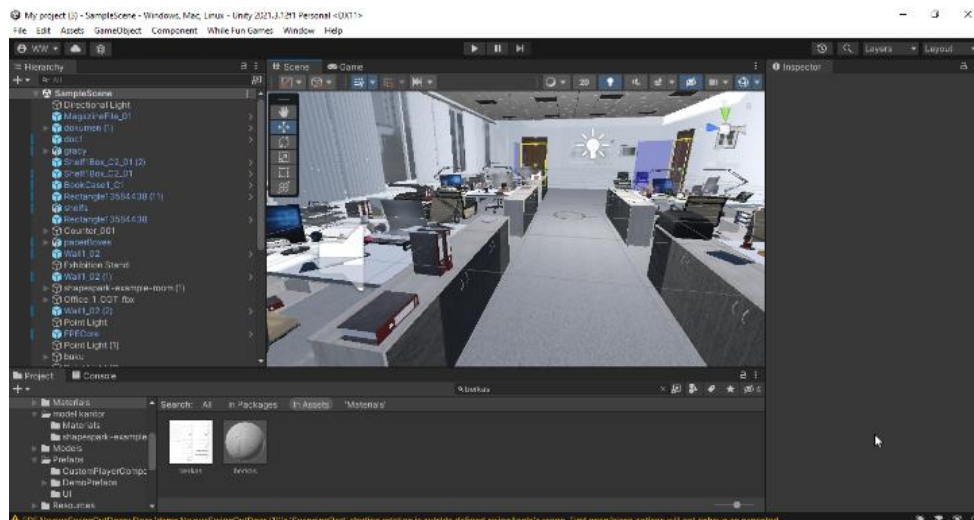


Figure 2. Development of archive workspace and archive storage room

The development of the archive workspace and archive storage space is adjusted to the conditions in the UT archive office so that the arrangement of books, shelves, archive storage places, computers, and archival activity equipment is adjusted to conditions in the field to create real conditions for users or students.



The results of the development of the archive workspace can be seen in Figure 3. The development of the archive workspace uses a room ratio of 1:1 with the conditions in the field because it is to create reality for users or students.

NO	KODE KLASIFIKASI ARSIP	JENIS-SERIES ARSIP	TAHUN	JUMLAH	TINGKAT PERKEMBANGAN	NO. BOKS	KETERANGAN
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

Figure 4. Inactive Archive List Form

In the management of inactive archives, an inactive archive list form is required, the form is entered in the initial process before recording the archives to be stored in the archive storage room of the Archives Unit because the frequency of use has decreased. Later, students will bring this form to the front room of the archives for the archive handover process from the faculty archive section or other units outside the Archives Unit. After the handover process is complete and making a Minutes of the handover of student archives or in this case acting as an archivist will fill out this form according to their needs after which it is stored in the archive storage room.



Figure 5. Initial Application View

The home page is the main page of the VR application of the DIV Study Program of Archives and Information Recording Management which contains several practical courses. In this study, this VR application presents the inactive archive management course.

### Material Validation Test Results

The results of the validation of the material aspects by the material experts aim to determine the feasibility of the material content in the VR MK Majemen Inactive Archives that is being developed. This material validation test was carried out by lecturers of the DIV Study Program in Archives and Information Records Management, Open University. This material test

has three aspects that will be assessed, namely, the content/material aspect, the spatial thinking aspect and the language and image aspect. The VR feasibility criteria are obtained from the analysis of the score obtained from the instrument given to the validator which is then applied according to the VR feasibility criteria. The content/material aspect of 10 questions obtained a total score of 36 points with a maximum score of 40 points and the score was obtained according to the following formula:

$$P = \frac{\sum x}{\sum xi} \times 100\%$$

$$P = \frac{35}{40} \times 100\% \\ = 87,5\%$$

The spatial thinking aspect obtained a score of 22 with a maximum score of 24 points. Based on the processing, the following results were obtained:

$$P = \frac{\sum x}{\sum xi} \times 100\%$$

$$P = \frac{22}{24} \times 100\% \\ = 91.67\%$$

The aspects of language and images obtained a score of 21 with a maximum score of 22. Based on the processing, the following results were obtained:

$$P = \frac{\sum x}{\sum xi} \times 100\%$$

$$P = \frac{21}{22} \times 100\% \\ = 95.45\%$$

Based on the data processing according to the processing above, the VR application obtained a score of 90.69%, which means that the VR application for the Inactive Archive Management Course developed by the researcher has very good feasibility. The suggestions given by the validator to improve the quality of this VR can be seen in the table below.

Table 1. Suggestions and comments from material expert validators

No	Suggest and Comment
1	It is necessary to provide text instructions for each movement
2	The name of the study program should be revised and adjusted to the new study program nomenclature.
3	Added sound/music that can add to the entertainment element

Based on the suggestions given by the validator, changes were made in the form of adding initial text as user guidance in using this VR application, improvements to the name of the Study Program which still uses the old name to Archives and Information Recording Management, and adding audio in VR.

### Learning Design Validation Test Results

Validation of learning design aspects is used to assess the suitability with the curriculum, learning methods and evaluations conducted by experts, namely lecturers of the Open University Archives and Information Recording Management Study Program. The validation test consists of three components, namely curriculum, methods and evaluation. In the curriculum aspect, the total score is 10 points with a maximum score of 12 and the score will be processed as follows:

$$P = \frac{\sum X}{\sum x_i} \times 100\%$$

$$P = \frac{10}{12} \times 100\% \\ = 83.34\%$$

The second aspect, namely the learning method, obtained a score of 21 out of a maximum score of 24 points, so the value obtained from the score is as follows:

$$P = \frac{\sum X}{\sum x_i} \times 100\%$$

$$P = \frac{21}{24} \times 100\% \\ = 87.5\%$$

The third aspect, namely the evaluation aspect, obtained a score of 19 out of a maximum score of 23 points, and the calculated score is as follows:

$$P = \frac{\sum X}{\sum x_i} \times 100\%$$

$$P = \frac{19}{23} \times 100\% \\ = 82.6\%$$

Based on the calculation above, the overall design aspect gets a maximum score of 50 points and a maximum score of 59 points. Then the data is processed to obtain the following scores:

$$P = \frac{\sum x}{\sum x_i} \times 100\%$$
$$P = \frac{50}{59} \times 100\%$$
$$= 84.74\%$$

Based on the results of the validation of the learning design and data processing above, the feasibility of VR obtained a score of 84.74%. This result shows that the VR product of the Inactive Archives Management course has very good feasibility. The input from the validator on the VR of the Inactive Archives Management course is as follows:

Table 2. Suggestions and comments from the expert validator of learning design

No	Suggest and Comment
1	Equipped with a grid that contains the Inactive Archives Management module
2	In the initial display it is explained that this VR program is an inactive archive process.

### Media Validation Test Results

Validation of media aspects consists of assessments related to product operation. Based on the results of media validation, the score obtained was 53 out of a maximum score of 56 points. Based on data processing, the following results were obtained:

$$P = \frac{\sum x}{\sum x_i} \times 100\%$$
$$P = \frac{53}{56} \times 100\%$$
$$= 94.64\%$$

Based on the results of media validation and data processing above, the VR feasibility obtained a score of 94.64%. This result shows that the VR product of the Inactive Archives Management course has very good feasibility. The input from the validator on the VR of the Inactive Archives Management course is as follows:

### Discussion

The results of this study are VR applications in the Inactive Archives Management course. This VR application developed is in the form of an Android application that can be used by students independently. The researcher chose to develop a VR-based application in the inactive archives management course because he saw that there were still many obstacles experienced by students in practicing in the field and from users who were concerned about the students' imperfect mastery of the Inactive Archives Management material. The stages of developing the VR for the Inactive Archives Management course used the stages of Lee & Owen (2004). The validation test of the VR application for the inactive archives management course is



divided into 3 aspects, namely the material validation test, the learning design validation test, and the media validation test.

The results of the VR application material validation test obtained a score of 90.69%, which means that the VR application for the Inactive Archives Management Course developed by the researcher has very good feasibility. These results are in line with Ariatama (2021) who stated that "VR users encourage innovation in learning media that is different from before to increase participation and critical thinking perspectives of students and bring students closer to VR technology". The suggestions given by the validator to improve the quality of VR are (1) Instructional text needs to be provided in each movement, (2) the name of the Study Program should be improved and adjusted to the new study program nomenclature, and (3) sound/music should be added that can add entertainment elements. So researchers need to do (1) adding instructional text at each stage of Managing Inactive Archives. (2) on the background of the reception desk there is the name of the Study Program as a characteristic of the VR application, because there is a change in the nomenclature of the Study Program, the naming of the background of the reception desk is changed to follow the nomenclature of the new Study Program, namely the Study Program for Archive Management and Information Recording. (3) as an element of entertainment, the author added music that has a fairly light capacity so that it does not burden users of the VR application.

The results of the Learning Design validation test, the feasibility of VR obtained a score of 84.74%. These results indicate that the VR product for the Inactive Archive Management course has very good feasibility. In line with Agusty's research (2020), it states that using Millealab software as a physics learning medium can provide a sensation that is in accordance with the definition of VR, namely that it can represent the imaginary world as it is. The input from the validator regarding the VR Inactive Archives Management course is as follows (1) Equipped with a grid containing the Inactive Archives Management module, and (2) On the initial display it is explained that this VR program is an inactive archive process. The improvements made by the researcher to the VR application include, (1) adding instruction text at each stage of Managing Inactive Archives according to the applicable grid, (2) providing information at the beginning of the user entering the VR application that this VR is running the Inactive Archives Management course.

The results of the media validation test, the VR feasibility obtained a score of 94.64%. These results indicate that the VR product for the Inactive Archives Management course has very good feasibility. In line with Darajat (2022) The results of the virtual reality video feasibility test on media experts that have been carried out received a positive response. Media experts gave a positive response of 100% with details of SS responses of 60%, S responses of 40%, mean 3.6, median 4, and mode 4. The input from the validator regarding the VR of the Inactive Archive Management course is that the application should not only be used on Android/iOS but also on the desktop. The improvements made by the researcher are trying to develop a VR application that can be applied on the desktop as well, because at the beginning of the development of the VR application it will only be applied on smartphones in the form of .apk.

## CONCLUSION

The development of the Inactive Archive Management VR application is very feasible to be applied to the learning of the Inactive Archive Management course, as can be seen from the large percentage of data processing results obtained from various experts who have been tested

in this study. With the development of this Inactive Archive Management VR application, students will get real virtual experience like practicing in an archive office.

## REFERENCES

- Agusty, A. I. (2020). Millealab media pembelajaran fisika berbasis virtual reality untuk mengajarkan topik pemanasan global. Seminar Nasional Fisika (SNF) 2020. Penluang-Strategi Pembelajaran dan Penelitian pada Masa Pandemi COVID 19 Menuju New Normal:104-110
- Ariatama, Soni, dkk. (2022). Penggunaan teknologi virtual reality (VR) sebagai upaya eskalasi minat dan optimalisasi dalam proses pembelajaran secara online dimasa pandemik. LPPM: Universitas Lampung
- Borg, W.R and Gall, M.D. (2003). Educational Research: An Introduction 4th Edition. London: Longman Inc.
- Darojat, Muhammad Abid, dkk (2022). Pengembangan virtual reality sebagai media pembelajaran sistem tata surya. Jurnal Kajian Teknologi Pendidikan. Vol. 5 (1): 91-99.
- Jia, X., & Huang, J. (2016). Development of Network Interactive Teaching Materials and Empirical in "Management" Courses. International Journal of Emerging Technologies in Learning, 11(5), 27-32
- Lee, W& Owens, L.D. (2004). Multimedia Based Instructional Design, Second Edition. San Francisco, CA: John Wiley & Sons, Inc.
- Republik Indonesia. (2012). Undang-Undang Republik Indonesia Nomor 12 Tahun 2012 tentang Pendidikan Tinggi. Kementerian Riset, Teknologi, dan Pendidikan. Jakarta.
- Sahulata, R.A.,dkk. (2016). Aplikasi Virtual Reality Pengenalan Kerangka Tubuh Manusia Berbasis Android. CogITo Smart Journal.
- Setijadi, dkk. (2005). Buku Pedoman Pendidikan Jarak Jauh. Tangerang Selatan: Universitas Terbuka.