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Development of the Rumah Karya application in the educational technology study program as a media database for the works of lecturers and students

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ABSTRACT

This research aims to produce Rumah Karya applications that provide a media product database for lecturers and students in the Educational Technology Study Program at Makassar State University. The research method used in this research is R&D (Research and Development), with the ADDIE development model divided into five stages: analysis, design, development, implementation, and evaluation. The Rumah Karya application has been validated by the head of a study program as a material expert and an information technology (IT) expert. Validation from material experts obtained an average of 98% very feasible category, and validation from IT experts obtained an average of 92% very feasible category. This application has been tested by lecturers and students in the Educational Technology study program, which produces an average of 83.8% which includes a very feasible category. The Rumah Karya application has been registered as intellectual property rights at Makassar State University. The Rumah Karya application has been implemented and integrated with the Educational Technology study program website. This research has the potential to carry out further research related to additional development features in Rumah Karya that can enhance the user experience in using the application. This research can also be extended to other study programs or other educational institutions to measure the generalization of Rumah Karya's application in improving the quality of media products in educational institutions.

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INTRODUCTION

The Educational Technology Study Program is one of the study programs under the Faculty of Education, Makassar State University, which has a graduate profile that can understand general concepts and operational knowledge of learning media and learning resources. To realize the graduate profile, the UNM Educational Technology Study Program elaborates it into several production courses, including learning multimedia, simple media development, graphic media development, cinematography, teaching material development, photo media development, online learning, audio media development, and development of video media. Each production course's final

target is media products by lecture material standards. The resulting media products can be individual or group assignments with a project-based learning model.

Educational technology students of Universitas Negeri Makassar students are encouraged to produce a Research & Development (R&D) thesis, one of the educational technology areas. The number of students taking an R&D thesis and graduating from 2021 is around 78.5%, while the rest are taking experimental and descriptive research types. The resulting Research & Development (R&D) thesis media products include teaching materials, learning videos, digital applications, and mobile learning. Media products resulting from the thesis or lecture output can be used as portfolios for Educational Technology study programs which can be used for accreditation activities, exhibitions, and comparative studies. Student media is still difficult to access quickly due to the absence of a container to accommodate this data.

Based on interviews with the head of the Educational Technology study program at Makassar State University, it can be explained several reasons that make it challenging to access media products resulting from production courses and student Research & Development (R&D) theses which are grouped into four factors, namely skills, suppliers, surroundings, and system. Based on the skill aspect, this is caused by the lack of lecturer skills in utilizing online database features, the lack of time for lecturers to manage student media products, the absence of a particular admin documenting the results of the R&D thesis, and the lack of understanding of lecturers regarding database processing applications. While on the supplier aspect, due to the absence of a particular place/location to store Research & Development (R&D) thesis results and the absence of a portal for collecting data on student media products. In the surrounding aspect, because students are not used to managing R&D thesis media or course products, and the lack of attention to R&D thesis media is caused by lecturers only focusing on the thesis. Finally, on the system aspect, there are no rules about how to collect and manage media from coursework or student R&D thesis.

Currently, the pattern of data storage leads to *cloud computing*, which means that data can be stored and accessed via the internet. If data is stored online, it does not need to take up physical space to store, and the advantages can be accessed anytime, anywhere, and by anyone. There have been many studies on online database development, one of which is research by Goh et al. (2021) which discusses the development of online *databases* in the form of e-references. This research discusses the development of a web-based database by collecting probiotic literature from various sources so that the developed e-references can become an information database for health professionals. Research on database development that aims to provide information has also been written by Sarker et al. (2022). Sarker et al.'s research discuss developing a geospatial database to identify and document the status of Tailings Storage Facilities (TSF) for the Australian government. Both of these studies have the same general goal, which is to develop *a database* as a source of reference information. The information displayed in a *database* should be able to provide consideration for certain parties concerned. The advantages of developing an online database are that it is more efficient and can be accessed anytime and anywhere, not limited to places or locations.

One of the tools that provide online database services is Google Data Studio. Google Data Studio is a site for creating data visualizations that make it easier to create reports, and the data displayed is easy to understand (Kemp &White, 2021). Google Data Studio allows users to filter the desired data based on specific categories or time ranges and can present relevant visualizations (Snipes, 2018). Other advantages of Google Data Studio include being free, being able to connect with Google products (Google forms, spreadsheets, etc.), complete widget options, being able to access comprehensive data sources, being easy to share, being able to make reports more interactive and easy to read, and having a selection of free templates. Google Data Studio is an application that focuses on presenting data or data visualization to make it simpler and more accessible for decision-makers to understand. Research on database development based on Google Data Studio is still rare. A study by Andrasto (2015), Apriani et al. (2022), Dukić (2013), and Purnadi (2021) only discusses data visualization using Google Data Studio, which describes the steps for using Google Data Studio to visualize data, combine data sources, and exchange data. Purnadi (2021) combines Google Data Studio as a data visualization tool and Google Sheets as raw data input. Rumah Karya application

development research combines several Google platforms to be able to produce a database that presents a variety of information, has attractive visualizations, and is easy for users to operate.

The development of Rumah Karya can be used as an alternative solution to the problem of difficulty accessing media products from production and R&D thesis courses for students and lecturers of the UNM Educational Technology Study Program. This study aims to produce the Rumah Karya application as an online database that stores research results, media products, and courses owned by lecturers and students of Educational Technology, Makassar State University. Rumah Karya was developed using the Google platform, which consists of Google Forms, Google Spreadsheets, Google Data Studio, and Google Sites. The Rumah Karya application produced in this study has been validated for its feasibility by material experts and Information Technology (IT) experts. This research has three major impacts, namely 1) making it easier for the public to take advantage of the work of product development students and lecturers of the Educational Technology Study Program, 2) assisting in the accreditation of study programs, 3) demonstrating the existence of the educational technology study program in local and national activities such as exhibitions, study appeal, and others. These three impacts still require separate studies to assess the effectiveness of the Rumah Karya application.

METHOD

The research method used is R&D (Research & Development) research, while the development model chosen is the ADDIE model. The ADDIE model consists of five stages: analysis, design, development, implementation, and evaluation (Bates, 2019). This research was conducted at the Educational Technology Study Program, Makassar State University, with the target research subjects being lecturers and students in the study program. Data collection techniques used in this study are questionnaires, documentation, and interviews. The questionnaire instrument consists of questionnaires for IT experts, material experts, and users (lecturers and students). Questionnaires were given to material and IT experts to determine the feasibility level of the Rumah Karya application. Questionnaires were also given to lecturers and students (users) to determine the user's responses to the Rumah Karya application. The data analysis technique used is descriptive statistical analysis. The questionnaire rating scale ranges from 1 – 5 (Very Inadequate – Very Eligible). The explanation of the eligibility score criteria, according to Arikunto (2009), is that it is said to be very Ineligible (<20%), Inadequate (21 – 40%), Adequate (41 – 60%), Eligible (61 – 80%), and Very Eligible (81 – 100%).

RESULTS AND DISCUSSION

Results

The Rumah Karya application has six main menus: Home, About, Forms, Collections, Statistics, and Contacts. The Rumah Karya application is integrated with *the website of* the Makassar State University Educational Technology study program (http://tp.fip.unm.ac.id/). The development of the Rumah Karya application is carried out using the ADDIE model flow.

Analyze

At this stage, an analysis is carried out regarding the needs for the development of Rumah Karya. The development of Rumah Karya is based on document analysis and the results of interviews with the head of the UNM Educational Technology study program. Based on the results of the problem analysis, alternative solutions were formulated to develop an online and easily accessible database. The Google platform is the first choice in developing Rumah Karya because it is free, easy to operate, has a varied appearance, and can be connected to various other types of Google *platforms* such as Google Spreadsheets, Google Forms, Google Data Studio, and Google Sites. At this analysis stage, a search for examples of database development based on Google Platform was also carried out, *and* an FGD *(Forum Group Discussion) was carried out* with the laboratory management team and the admin of the UNM Educational Technology study program. Discussions were held to discuss

what learning media data had been collected and what media data had yet to be collected, and whether it was possible to collect it.

Design

The design stage includes making *flowcharts*, designing the appearance of Rumah Karya, and compiling question items as instruments for collecting media data for lecturers and students. This question item will then be developed through a Google Form, which is integrated into the Rumah Karya application. The question items on the Google Form are used as the basis for designing the Rumah Karya application so that it can display media product data based on the categories of questions submitted. The question items submitted in the Rumah Karya Google Form in Table 1.

Table 1. Questions from Google Form Rumah Karya TP

No.	Question	Alternative Answers
1.	E-mail	Short Answer
2.	Status	Lecturer/ Student
3.	Full name	Short Answer
4.	ID number	Short Answer
5.	Types of products	Research & Development (R&D) Thesis Results/ Course Results/ Research Results (Lecturers)
6.	Media Type	Audio Media/ Video Media/ Application (Learning Multimedia)/ Games/ Simple Media/ Educational Movies/ Print/Digital Books/ Graphic Media (Posters, Infographics)
7.	Media Title	Short Answer
8.	Media Manufacture Year	Short Answer
9.	Media Handbook	Upload Files (Maximum 100Mb)
10.	Media Reviews	Upload Files (Maximum 100Mb)
11.	Media Product Uploads	Upload Files (Maximum 100Mb)

Development

The development phase consists of developing Rumah Karya applications using Google Platforms (Google Sheets, Google Forms, Google Data Studio, and Google Sites). The Rumah Karya application is developed based on Google Sites as the main framework, which combines the appearance of Google Data Studio and Google Form. The data collected by the Rumah Karya application is processed through a collaboration between Google Forms and Google Spreadsheet, then visualized using Google Data Studio. During the development stage, books and video guides for the operation of Rumah Karya were also made. The Rumah Karya application then enters the validation stage, which consists of validating IT experts and material experts. Figure 1 shows IT experts validation. The aspects assessed at the validation stage by IT experts and material experts consist of: aspects of usability quality, information quality, service quality), and visual quality (visual quality). These four aspects were adapted from the Webqual 4.0 method. Webqual is a method used to measure website quality based on the perception of the website's end users (Barnes & Vidgen, 2002).

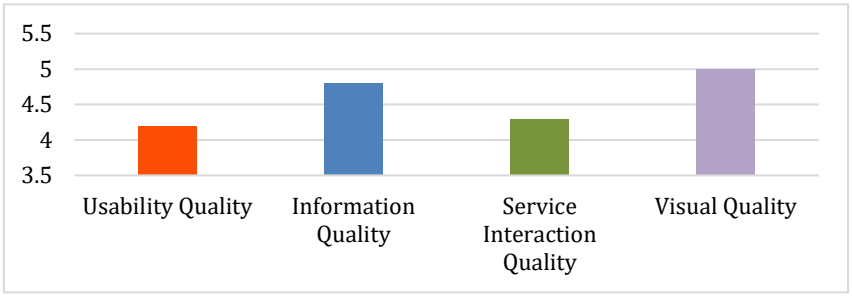

Figure 1. Validation of Rumah Karya by IT Experts

The average rating score by IT experts on the usability quality aspect is 4.2 or 84% in the Good category, in the information quality aspect, 4.8 or 96% in the Very Good category, on the service aspect interaction quality, namely 4.3 or 86%, is included in the Good category, and in the visual quality aspect, namely 5, which is included in the Very Good category. It can be concluded that the validation results by IT experts have an average overall score (4 aspects), namely 4.6 or 92%, which is in the Very Good category. Figure 2 shows validation of material expert.

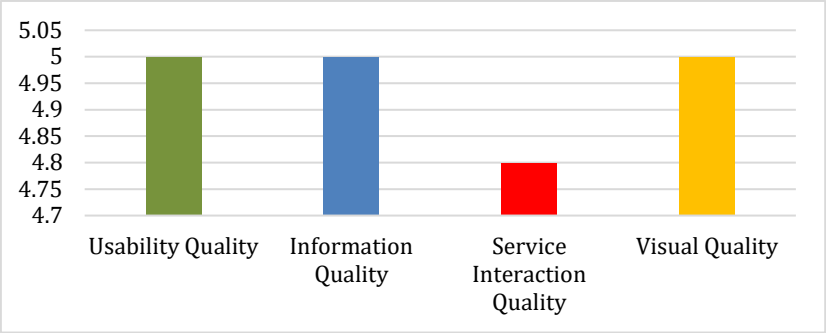

Figure 2. Validation of the Work House by the Head of Educational Technology Study Program

The average score of the assessment by material experts on the usability quality aspect, namely 5 or 100%, is included in the Very Good category, on the information quality aspect, namely 5 or 100% is included in the Very Good category, on the service interaction aspect quality, namely 4.8 or 96%, is included in the Very Good category. The visual quality aspect, namely 5 or 100%, is included in the Very Good category. It can be concluded that the validation results by IT experts have an average overall score (4 aspects), namely 4.9 or 98%, which is in the Very Good category.

Implementation

At the implementation stage, the Rumah Karya application is ready to be used by users, namely lecturers and students of the UNM Educational Technology study program. The dissemination and launching of the Rumah Karya application were carried out to make it more widely used. At this stage, the Rumah Karya application is ready to receive media data entered by users (lecturers & students) via the "Form" menu. Visitors can access media data recapitulation to the Rumah Karya application through the "Collection" and "Statistics" menus. Figure 3 to 4 show tahet The Rumah Karya application provides five main menus, namely Home, About, Forms, Collections, and Statistics.

Figure 3. Display of the Rumah Karya Application Homepage

Figure 4. Rumah Karya Application Guidebook

Evaluation

The evaluation of the Rumah Karya application is measured using a user questionnaire which contains questions regarding the feasibility and quality of the application. Question items were developed using the Google Form with a scale of 1-5 (Very Poor-Very Good), which were distributed to lecturers and students of the Educational Technology Study Program at Universitas Negeri Makassar. Several question items and the average score recapitulation can be seen in Table 2.

Table 2. Evaluation Questions for Rumah Karya Applications

No.	Question	Average Score	Percentage	Category
1.	Easy to operate	4.25	85%	Very Worth it
2.	Ease of navigation	4.25	85%	Very Worth it
3.	Attractive appearance	4.05	81%	Very Worth it
4.	Provides up-to-date information	4.35	87%	Very Worth it
5.	Provide information that is easy to read and understand	4.2	84%	Very Worth it
6.	Provide information in an appropriate format	4	80%	Worthy
7.	Provides sufficiently detailed information	4.15	83%	Very Worth it
8.	Ease of attracting interest and attention	4	80%	Worthy
9.	Ease of providing feedback	4.3	86%	Very Worth it
10.	Use of fonts/letters	4.25	85%	Very Worth it
11.	Use of color and style	4.3	86%	Very Worth it

Figure 5. Rumah Karya Application Socialization Activities

After going through the ADDIE development stages, in Figure 5, the Rumah Karya application can be implemented as a media database created by lecturers and students at the Educational Technology Study Program at Makassar State University. The Rumah Karya application that has been implemented is then socialized as a form of dissemination to the public. Socialization of the Rumah Karya application is carried out through Zoom Meetings and YouTube (https://www.youtube.com/@TPFIPUNM).

Discussion

This research discusses the development of the Rumah Karya application, which is integrated with the website of the Makassar State University Educational Technology study program (http://tp.fip.unm.ac.id/). This application has six main menus: Home, About, Forms, Collections, Statistics, and Contacts. The development of this application is carried out using the ADDIE model flow, namely, Analyze, Design, Development, Implementation, and Evaluation. The Rumah Karya application was developed based on the results of document analysis and interviews with the head of the Educational Technology study program at Makassar State University. The Google platform is the first choice in developing Rumah Karya because it is free, easy to operate, has a varied appearance, and can be connected to various other types of Google platforms such as Google Spreadsheets, Google Forms, Google Data Studio, and Google Sites. The database is visualized using the Google Data Studio application. Google Data Studio has several advantages, including being visually appealing; combining data from various sources; getting real-time updates; enabling rapid development and deployment; and being free (Muharni et al., 2022).

The Rumah Karya application is developed based on Google Sites as the main home, which combines the appearance of Google Data Studio and Google Form. The data collected by the Rumah Karya application is processed through a collaboration between Google Forms and Google Spreadsheet, then visualized using Google Data Studio. During the development stage, books and video guides for the operation of Rumah Karya were also made. The Rumah Karya application has been validated by IT experts and content experts. It includes assessments on aspects of usability quality, information quality, service quality, and visual quality using the Webqual 4.0 method. P. Longstreet (Rerung et al., 2020) defines Webqual 4.0 as a technique for assessing the quality of a website based on user perceptions. The results of validation by IT experts and material experts show that the Rumah Karya application has a very good overall score (92% and 98% fall into the Very Good category). This very good category shows that the Rumah Karya application has fulfilled the three dimensions of good website quality based on Webqual 4.0 criteria, namely: usability quality, information quality, and service interaction quality.

CONCLUSION

The development of the Rumah Karya application follows the ADDIE development steps (analysis, design, development, implementation, and evaluation). Rumah Karya, as a media database for lecturers and students in the Educational Technology Study Program, is included in the Very Eligible category from the validation results of IT experts (92%) and materials (98%). The results of the feasibility assessment by users (lecturers and students) show an average score of 83.8% in the Very Eligible category. Overall, the Rumah Karya application can be very feasible to serve as a media database for the work of lecturers and students in the Educational Technology Study Program at Makassar State University. The existence of the Rumah Karya application can help study programs manage media works from lecturers and students, both research results, theses, and production courses. In this study, the application of Rumah Karya is still limited to utilization at the level of the Educational Technology study program at Makassar State University. Suggestions for further development are that the Rumah Karya application can be adapted as well as a best practice for using cloud-based databases. This research has the potential to carry out further research related to developing additional features in Rumah Karya which can enhance the user experience in using the application. This research can also be extended to other study programs or educational institutions to measure the generalization of Rumah Karya's application in improving the quality of media products in educational institutions.

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