

Interactive Media Applications as Learning Aids for Food Preservation Practice Courses for Deaf Vocational Students

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Abstract

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This study aims to develop an interactive learning application that helps in providing direction on food preservation practices which are then expected to be a means of delivering material using video tutorials, text and equipped with sign language interpreter videos so that learning becomes more communicative for deaf students. The research method used in this study is the Research and Development (R&D) method. The development procedure used in this research is the Luther-Sutopo method. Subjects in this study focused on deaf students who took food preservation courses. The form of the instrument used in this research is a questionnaire. The results of the study show that at stage (1) The interactive learning application can help in providing direction on food preservation practices for deaf students. This application contains a means of delivering material in the form of learning tutorial videos equipped with text and added with translator videos using sign language. This application is declared feasible in all aspects either by media experts or deaf students. (2) The results of application trials from media experts obtained the most in the aspect of assessing media integration. The results of the trial obtained from deaf students obtained the highest score was on the artistic and aesthetic aspects and on the aspects of overall functioning.

Keywords:

deaf students, interactive media, vocational

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INTRODUCTION

Higher education is a must as an effort to cut the chain of poverty which is the key to sustainable development. The implementation of higher education must fulfill all aspects of accessibility, in terms of infrastructure to accommodate the different needs of each student, especially those with disabilities (Supena, A., Yusuf, M., 2019). Persons with disabilities are those who experience disturbances, difficulties or obstacles in carrying out certain activities that require special equipment (Fajri et al., 2020).

Currently the government has made an inclusive education system policy where every place of education must be open and accept children with special needs to study with normal students in general (Riyad & Pramana, 2020). This policy is considered a strategic effort to solve the problem of education for children with special needs. Education for persons with disabilities in Indonesia consists of three systems. The first is the segregated education system which has been practiced in special schools (SLB), which are special schools for inclusive children (Andikos, 2019). Both systems are integrated education (integrated education) which places students with disabilities in public schools but are



grouped into one class (Ratna Ermawaty & Hidayat, 2020). Third, an inclusive education system where students with disabilities study together with other students in a common context (Supena, A., Yusuf, M., 2019).

Private universities have now opened an inclusive education system as suggested by the government that one of the government's efforts is to fulfill the rights of children with special needs to access quality education which eventually resulted in an inclusive education system (Kurniawati et al., 2015). Persons with disabilities have the same right to obtain education as stated in Law no. 20 of 2003 that the national education system states that every citizen (without exception) has the right to obtain quality education (Afrianty et al., 2020).

A private university that has implemented this call is the "AKK" Social Welfare Academy. This academy has a study program that is closely related to vocational education, one of which is culinary arts. The students who have been accepted are mostly students who are deaf. Deaf students need visual media in order to access information easily and effectively (Anwar et al., 2020). This is one of the obstacles experienced by individuals with disabilities. These inclusive students need special learning methods. One particular learning method that has been successful is the Ideal CRV learning method (Mustika et al., 2018). Mirnawati and Yuwono's research (2020) stated that it developed several learning models for students with special needs, one of which was the CRV-IDEAL model which was designed based on the learning principles of deaf children which include face-direction, sound-direction, intersubjectivity, concreteness (Kurniawan & Wijayanti, 2020), visualization (Ratna Ermawaty & Hidayat, 2020), demonstrations, unified experiences, and learning by doing. It is expected to facilitate and make easier for deaf students to participate in class activities, especially for practical courses (Yuwono, 2020).

Based on the journal, this learning method can be done in classroom learning, but during this pandemic learning really needs to be done online. One of the practical courses that must be mastered by deaf students is food preservation course. This material consists of the concept of food preservation & fermentation processes and can be processed with various preservation techniques, such as: drying, cooling, freezing, heating, adding chemicals, fermentation, and smoking. Interactive media application as a practical learning tool for food preservation course can be used in the implementation of the CRV IDEAL learning model which emphasizes the learning principles of deaf children with the help of a sign language spokesman (Sari et al., 2019). Sign language interpreter able to accommodate the visual learning styles of deaf students, so as to increase the learning participation of deaf students in lecture activities in the classroom (Naz, 2009). Research on interactive learning videos in learning is often done, for the development of interactive learning applications that help in providing direction on food preservation practices has never been done, thus it is hoped that it can be a means of delivering material using video tutorials, text and equipped with a sign language translator video so that learning be more communicative for deaf students.

METHODS

The research method used in this study is the Research and Development (R&D) method, which is one of the research methods used to produce products and conduct tests on the level of product usability (Sugiyono, 2017). The research was conducted in the Culinary Arts Study Program with a time in November 2021. The subjects in this study were focused on deaf students who took food preservation courses. This research is focused on the Culinary Arts Study Program of the AKK Yogyakarta Social Welfare Academy.

In this study the data collection techniques consist of interviews, questionnaire and documentation. Interviews are used to determine needs analysis in the selection of teaching materials which will be presented in the form of interactive learning application products. In this study, the questionnaire resulted in assessments from media experts, material experts, educator responses and student responses regarding the feasibility level of an interactive application product for food preservation practices that are being developed using a Likert scale. Documentation acts as a guide in searching for information data. Documents related to learning applications are lesson plans, syllabus and curriculum.

The development procedure used in this research is the Luther-Sutopo method consisting of 6 stages, namely concept, design, material collection, assembly, testing and distribution. a) This first concept stage begins with determining the basic idea of the program to be developed, according to the learning objectives, determining the concept of the material and determining the concept of content in the media. b) This stage includes designing teaching materials, making flowcharts, and story boards that function to make media more structured, c) This stage includes the collection of teaching materials which will later be displayed on the media. The form of the above materials includes materials such as images, videos, text, sign language videos, and so on to support the application, d) The assembly stage is the process of material processing until the media objects that have been collected and combined with the teaching discussion become a structured media according to the flowchart and story board, e) The testing stage is carried out right after the media has been successfully created, then the media is tested through testing the operation of the media to find out where the error or bag in the system is. The stages of testing include: 1) Alpha Test: (a) Testing by Media experts and (b) Testing by Material Expert. 2) Beta Testing. f) The distribution stage is the process of storing learning media into a storage medium in this study in the form of an android application that is installed to educators and students, especially students who are deaf (Faradian Prasetyo, 2019). The form of the instrument used in this research is questionnaire. This instrument is used to obtain the feasibility of the quality of interactive learning media. Instruments are classified into 3 types, namely material experts, media experts and respondents (Septiana, 2020).

Table 1. Media rating score

No	Score Range	Score	Category
1.	$Mi + 1,80 S_{Bi} < X$	A	Very good
2.	$Mi + 0,60 S_{Bi} < X \leq Mi + 1,80 S_{Bi}$	B	Good
3.	$Mi - 0,6 S_{Bi} < X \leq Mi + 0,60 S_{Bi}$	C	Pretty good
4.	$Mi - 1,80 S_{Bi} < X \leq Mi - 0,6 S_{Bi}$	D	Not good
5.	$X \leq Mi - 1,80 S_{Bi}$	E	Not bad

Data analysis questionnaire assessment of media experts and material experts in the form of quantitative scores which will later be converted into qualitative ones.

RESULTS & DISCUSSION

RESULTS

Concept

This stage is to determining who will be the user. Determination of the concept is made based on consideration of the purpose, benefits, persons who use email, and describes the concept. The following is an explanation of the concept stage:

- a. The purpose of this application is to make easier for teachers / special educators for deaf students to become an application that is used to upload demonstration videos with sign language interpreter (Nikolawatin et al., 2019). For students can directly access the learning video that has been given an additional video with a sign language interpreter. The concept of teaching materials is to demonstrate food processing, food preservation and fermentation. This learning media is adapted to the subject teaching materials. So it's very important that a learning media must have interaction with information technology (Amirullah & Susilo, 2018).
- b. Application users are lecturers/teachers and deaf students.
- c. This application has two main menus, namely the instructor menu which is used by educators to upload video links that have been equipped with a video of sign language interpreter (JBI). The second menu is the student menu, where this menu allows deaf students to view videos with the addition of JBI (Andikos, 2019).

Design

At this stage the researchers made specifications regarding android-based applications from the program (Zamhari et al., 2022), style, appearance and material requirements for the program (Runtulalo et al., 2019). The design will be made using the Bootstrap framework UI design. The software used to design the interface is PHP Programming and MySQL database. In this stage, the design is made using the following stages:

a. Designing material

The learning materials taken from this research are preservation and fermentation courses. The learning materials for food processing include:

b. Flow chart

This flowchart is used to show the flow of pictures of the application instructor sequences that can be seen (Yuwono, 2020)

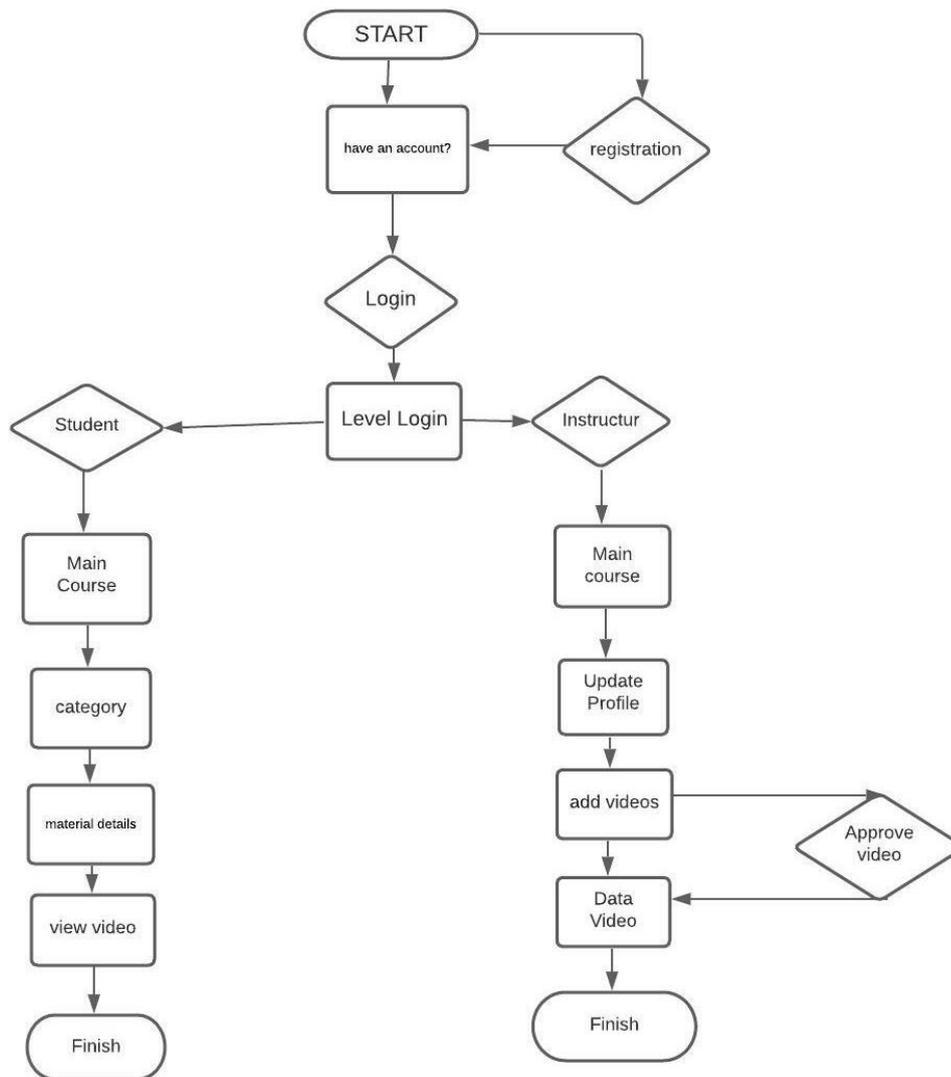


Figure 1. Flowchart application culinary app

Figure 1 contains a flowchart image that displays the application flow from the initial display then enters the login menu display which first registers as a student or instructor. The student menu is used for students to enter to log-in, in the student menu it has the main menu, then category, material design, video view menu. The instructor menu contains the main menu, an updated profile used to approve whether educators are included in the requirements to be able to add videos, the next menu for videos is still being selected for admin approval, and finally the educator video data menu.

c. Use Case

This stage is used to describe the relationship between the user and the application (Zulfita et al., 2019).

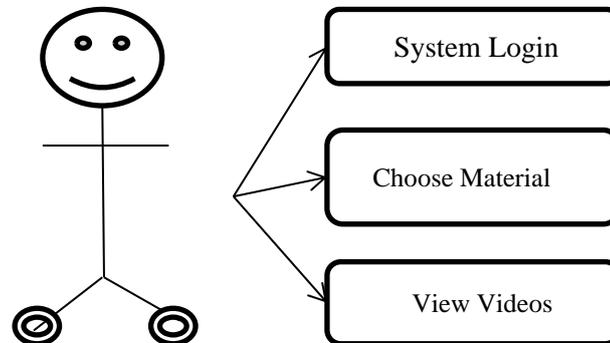


Figure 2. Use Case Diagram

Figure 2 illustrates the relationship between the user and the application created, the user can access the application after logging in to the system then the user can select the desired material. After that the user can see a demonstration video of the processing. The following figure 3 about the user use case of the relationship between the educator account and the application can be seen in the following figure:

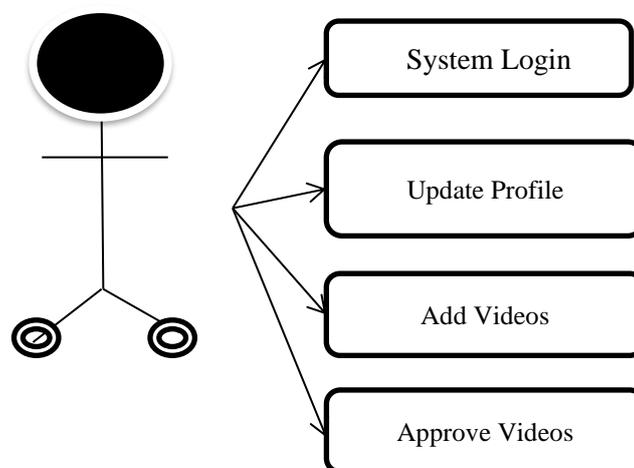


Figure 3. Use case teachers

Figure 3 illustrates the relationship between educator users and the application made starting from the educator logging in to the system, then the educator inputs profile data to get approved as an instructor, after that educators can add videos with specified conditions, namely food processing demonstration videos and also videos with additional sign language interpreter. Then the video is processed to be approved by the application admin.

d. Storyboard

This storyboard stage is used to convey ideas to others in the form of pictures (Satria, 2018). the login menu storyboard is an illustration of the plan to place the login menu button on this menu consisting of the application logo, user

login access (student and instructor), username, password and login button. The storyboard menu of categories and learning materials consists of 3 parts, the upper part is the category data, the middle part is the learning material menu by category, and the lower part is the icon menu. The story board displays 2 parts of the display, the upper part is a video display that can be selected and displayed according to the category and the lower part is the icon menu for other materials.

Material Collecting

This stage is the stage of collecting materials in accordance with the purpose of the application being made. Learning materials are obtained from semester lesson plans from interviews with lecturers of food preservation and fermentation courses. On multimedia-related material, the authors get from various references sourced from journals, books and the internet. Application materials are collected and images that will be used as backgrounds. In building this application, hardware and software are needed. The hardware uses a PC and the software uses software used to design the interface is PHP programming and the MySQL database is used to create application programs.

Assembly

This stage is the initial view in the application which is detailed from the initial view to the last view. The following displays will be explained

a). Splash screen display

Is the initial screen when opening the application, which consists of the application logo and the start button to proceed to the next stage.

b). Login view

This second display is a login display that contains a user level form, a username form and a password form. This login data can be obtained after a new user register first to get an account. In Figure 8 is an image of the login display, there is a radio button consisting of one student radio button and one instructor radio button. The text box below the radio button is useful for entering a username and password.

c). Register View

The next screen is the registration screen for new users who do not have an account, so they are required to register new data before logging in to the system. This display consists of user access level form, full name form, gender form, username form and password form. Under the password text box there is a button to login. In this display, there is also the bottom text that provides information if the user does not have an account, it is mandatory to register first.

d). Student main menu display

A display for users who choose students, namely students consisting of notifications to users related to successful logins in the application. The category menu is displayed with images of product categories that can move horizontally to the right or left and vice versa. The material menu is more specific to learning materials that are displayed with pictures, the name of the

material, the title of the material, and the number of views that saw the video. At the bottom, there are four menu icons, namely the home icon, the material icon, the like or comment icon, and the user profile icon. The function of the home icon is for users who want to return to the initial view, the material icon contains all video data of learning materials, the like or comment icon functions for all user comments who like the content. The user profile icon functions for users to change profiles and the system logs out for users who will exit the system.

e). View Details of learning materials

It is a detailed view of the learning material which contains the title of the material, description of the material in the description column, and the comment column. In the title of the material there are ratings and likes to determine satisfaction about the video. The description column serves to display a description of the material that can be filled with a recipe. The comment column can be used for student users and instructors to ask and answer each other.

f). Video view

It is an in-app learning video display that displays videos that users will see. This video is inputted to a YouTube link uploaded by educators/teachers/lecturers through the instructor's account. This video will be approved by the admin on the condition that it is a learning media and there is also a video with a sign language interpreter. If you don't meet these 2 conditions, the admin will not give approval for the video to appear in the application. it is an updated user profile view of the instructor. This display consists of the full name form, username form, latest education form, major form, telephone form, email form and address form. This view is an instructor data input form that is used to provide information to the admin whether the user can become a member of the instructor or not. In this menu the user waits for admin confirmation in order to add videos.

g). Add Video View from Instructor

The display of the application on the add video menu. This view can only be used by instructor users. In this display there is a text box for the name of the material that can be filled with the title of the content, the next text box is the YouTube URL which serves to put the YouTube URL, the third text box is a category that serves to determine what category the content belongs to. In the category menu there are 6 choices of categories based on learning materials. In the last text box, the user can add a description or it can also be used to write a recipe for processing a food. In the last section there is a menu for uploading images.

Testing Product

This stage is used to determine the quality of media products and materials developed. Testing product is done by alpha testing, namely expert judgment (media experts and material experts) and beta testing is carried out on deaf students.

a. Alpha Test

1) Expert judgment media

This test is carried out by a Media Lecturer at the Social Welfare Academy "AKK" who is in charge of applied computer courses. This media assessment uses a questionnaire of 25 instrument items with answer choices 1-5 covering aspects of ease of navigation, media integration, artistry and aesthetics and overall function.

Table 2. The Results of Media Expert Trials

No	Aspect of assessment	Observation Score	Expected Score	Eligibility Percentage	Category
1	Ease of Navigation	50	75	66,6%	Good
2	Media Integration	99	130	76,2%	Good
3	Artistic and Aesthetic	7	10	70%	Good
4	Overall Function	36	50	72%	Good
Mean result				71,2%	Good

Source: Primer, 2021

Based on the results of media expert trials, the highest value was obtained on the integration aspek the media can be said to be feasible, this is obtained 76.2% declared worthy by media experts then in the aspect of overall functioning is also said to be feasible with a percentage of 72%. The assessment aspect that still needs to be improved is the ease of navigation with eligibility at 66.6%.

2) Expert judgment material

The material testing was carried out by a Culinary Arts Lecturer at the Social Welfare Academy "AKK" who was in charge of food preservation and fermentation courses. The material expert test uses 21 instrument items with answer choices 1 to 5.

Table 3. The Results of Material Expert Trials

No	Aspect of assessment	Observation Score	Expected Score	Eligibility Percentage	Category
1	Cognitive Content	44	60	73,3%	Good
2	Information Presentation	31	45	68,8%	Good
Mean result				71,05%	Good

Based on table 3 it can be seen that matter can cognitional be said to be deserves to be used in learning. On the presentation of information still needs to be added such as the recipe on the video for more complete information.

Beta Test

This test was carried out by students of deaf students of the Social Welfare Academy "AKK" who took food preservation and fermentation courses.

Table 4. The Results of deaf students of the Social Welfare

No	Aspect of assessment	Observation Score	Expected Score	Eligibility Percentage	Category
1	Information Presentation	216	300	72%	Good
2	Ease of navigation	71	100	71%	Good
3	Artistic and Aesthetic	96	125	76,8%	Good
4	Overall function	95	125	76%	Good
Mean result				73,95%	Good

Based on table 4 it can be said to be worthy of artistic and aesthetic. Respondents in this study assessed that in the artistic and aesthetic aspects it was feasible as much as 76.8% to be said learning media, next on the aspect of the overall functioning of the percentage eligibility of 76% has also been said to be feasible. The aspect that needs to be improved is in ease of navigation that must be improved in the future. So that it can be used to the maximum.

Distribution

This stage is carried out after the media has gone through the testing process to obtain the results of the feasibility of the media both from Alpha and Beta Testing. Furthermore, products that are distributed to lecturers as supporting media can be accessed through the playstore. However, in terms of uploading programs, researchers have problems, namely the code the application is not or has not been allowed by Google so that the researcher changes the coding of the program application in the repair stage.

DISCUSSION

The development of this interactive learning application helps in providing direction on food preservation practices. This application contains a means of delivering material in the form of learning tutorial videos equipped with text and added with translator videos using sign language. This application is accepted by deaf students because it can be a communicative medium for deaf students.

The concept used in this learning is almost the same as using content media such as Youtube but this application chooses learning video content with the addition of a sign language interpreter. This application only has two users, namely the user as the uploader of the video and the user user or student who will use this application. The app still has limited material. The material is obtained from the semester learning plan or module that the educator will use.

The results of application trials from media experts are obtained the largest in the media integration indicator. Where media integration is an activity that involves the allocation of limited resources with efficient use. In addition to media integration, the highest score that media experts give is on the aspect of overall functioning. However, all aspects of the assessment according to media experts are categorized as feasible on all indicators. However, this application still needs

input to be better, namely in the aspect of ease of navigation still needs to be improved.

Media integration can be seen from the beginning of the display entering the application. There are two buttons that describe the user. The appearance of the menu at the beginning also illustrates the limited media integration but can find out the contents of the entire application so that it is considered efficient in making menus. In the overall aspect, the media also stated that it was feasible. This can be seen from the user interface which consists of a menu of students and educators. The educator menu must meet the application requirements for educators to upload video, in contrast to the student menu which can only display a table of material contents and videos that can be viewed directly. The student menu is limited because it is only for viewing videos directly.

The results of the trial obtained from deaf students obtained the highest score was on the artistic and aesthetic aspects and on the aspects of overall functioning. This illustrates that. In this aspect directly or visually the learner receives the appearance of the application. This application is considered artistic and aesthetic. This can illustrate that this application display model is acceptable to students, especially for deaf students. The menu presented is also considered feasible as a whole, this illustrates that the use of this application is easier for deaf students to understand. Other aspects still need to be improved in the application, namely the ease of navigation and presentation of information so that planned learning outcomes can be achieved. This happens because of the limited time of filling in the material so that the information generated has not been obtained much by the user.

CONCLUSION

The results of the study show that at stage (1) The interactive learning application can help in providing direction on food preservation practices for deaf students. This application contains a means of delivering material in the form of learning tutorial videos equipped with text and added with translator videos using sign language. This application is declared feasible in all aspects either by media experts or deaf students. (2) The results of application trials from media experts obtained the most in the aspect of assessing media integration this application still needs input to be better, namely in the aspect of ease of navigation still needs to be improved. The results of the trial obtained from deaf students obtained the highest score was on the artistic and aesthetic aspects and on the aspects of overall functioning. According to students, other aspects still need to be improved in the application, namely the ease of navigation and presentation of information so that planned learning outcomes can be achieved. This happens because of the limited time of filling in the material so that the information generated has not been obtained much by the user.

CONFLICT OF INTEREST

Concerning the research, authorship, and publication of this paper, the author(s) reported no potential conflicts of interest.

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