



Development of E-Module as an Instructional Media for Students with Hearing Impairments

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Abstract. This study aims to produce an adaptive learning media that students with hearing impairments can use to increase independence in learning activities. In this study, the validity of the developed media was also tested. This development research uses the Instructional Development Institute (IDI) model, which consists of three stages. The first stage is the definition stage, which contains problem identification and background analysis steps. The second stage is the development stage which includes the preparation of the initial form of the product, and the third stage is the evaluation stage. The research instrument used is a validation sheet consisting of content and media validation which is analyzed by the descriptive analysis technique. The results showed that 1) the e-module developed was very good in the content aspects, and 2) the e-module developed was good in the media aspect. Based on the study's results, the e-module developed is valid for use as media for students with hearing impairments.

Keywords: Disability; Electronic Module; Adaptive Media;

INTRODUCTION

Implementing inclusive education policies provides broad opportunities for people with disabilities to get an education with regular students. As mandated by Law Number 8 of 2016, persons with disabilities have the right to receive a quality education in education units in all types, pathways, and levels of schooling inclusively and especially. For inclusive education providers, the consequences of this policy must, of course, be able to adapt learning to the needs of all students (Abdullah & Aman, 2021; Dermawan, 2013; Maftuhatin, 2014).

Recently, much higher education institutions have provided opportunities for

students with special needs to be enrolled as students in regular classes. Students with special needs or persons with disabilities experience difficulties/barriers in carrying out certain activities. They require special aids, environmental modifications, or appropriate alternative techniques to participate in optimal learning (Dermawan, 2013; Jauhari, 2017). Students with special needs enrolled in higher education institutions require learning modifications according to their needs (Nugroho & Mareza, 2016; Pratiwi et al., 2018).

Similar to how inclusive educational institutions like colleges consistently provide a wide range of educational opportunities for individuals with impairments. The most

registered types of students with special needs include the blind, deaf, and students with physical impairments. But on the other hand, the readiness for learning adaptation has not been carried out optimally as in the case of using media and learning resources, which generally can only be fully utilized by regular students (Utami et al., 2021).

This situation can certainly affect the learning of students with special needs, whose education has not been served optimally. Various technologies have been created to overcome these problems. Such as the presence of a screen reader for the visually impaired and videos and photos to assist the deaf (Meimulyani & Caryoto, 2013; Pratiwi et al., 2018). However, screen reader applications with full features are still quite expensive, while those that are free to download and use have many drawbacks, such as reading terms that are sometimes unclear (Mahdia, 2014; Panggabean & Ati, 2017).

In the classroom, educators play a crucial role in modifying the learning environment to meet the learning objectives regarding models, techniques, methodologies, or instructional material and media. To enable the shift from a teacher-centered to a student-centered teaching paradigm, educators must be able to modify the learning environment effectively.

In terms of learning media, with the help of technology, teachers can provide instructional media that all students can access. Media is a tool for transmitting messages from the sender to the recipient. (Smaldino, 2012) defined the media as anything that sends information from a source to a recipient. To accomplish the learning objectives, instructional media is a tool to enhance learning activities and clarifies the meaning of the message to be communicated.

The use of instructional media can enhance teaching and learning processes. Visual, audio, audiovisual, and multimedia are all types of media (Anwas, 2014; Smaldino, 2012). The aim of the competence to be attained must be considered by the educator when employing an instructional medium. Other elements that must be considered when choosing media include material compatibility, efficacy, and compliance with the relevant educational system. Every class has unique requirements and circumstances, as (Marlina et al., 2019) say, so teachers must, of course, select the appropriate

instructional material following the objectives they hope to accomplish.

Such as electronic learning modules that are built with an analysis of the needs of students with hearing disabilities. Electronic modules can contain various content such as audio, video, text, images, animations, and others that can help student learning (Irwansyah et al., 2017; Resita & Ertikanto, 2018; Serevina et al., 2018). This electronic module has been widely used in regular classes, but only a few have developed it to be also used by persons with disabilities, especially the deaf.

This research will produce an electronic learning module that deaf students in inclusive classes can use based on this description. In the electronic module, in addition to the context of text and graphics, a learning video with sign language will be added to help the learning of deaf students. The learning module that will be developed is the learning module for children with learning disabilities, one of the mandatory courses that must be taken by students of the Department of Special Education.

By providing learning resources following learning needs, this research will assist in implementing an adaptive learning process, which will help achieve the strategic goals of higher education and implement Minister of Research and Higher Education Regulation No. 46 of 2017 concerning Special Education and Special Service Education in Higher Education, which mandates that universities facilitate learning and assessment following the needs of Students with Disabilities.

METHOD

Based on the background and objectives of this research, the type of research to be conducted is development research. This research includes research that will develop and produce a product in the form of an electronic learning module designed as an adaptive learning media in the inclusive classroom. The Instructional Development Institute (IDI) model applies the systems approach principles, which include three stages: define, develop, and evaluate (Gustafson et al., 1998). The first stage is the definition stage, which contains problem identification and background analysis steps. The second stage is the development stage which includes the preparation of the initial form of the product.

Meanwhile, the third stage is the evaluation/assessment stage, which contains the test steps and analysis of the test results. The research instrument used a validation sheet for

content and media aspects (in Table 1 and Table 2) that were assessed by two validators for each element. The collected data is then analyzed using descriptive analysis.

Table 1. Indicator items of instrument for material expert

Aspect	Indicator
Content Eligibility	Conformity with learning objectives Clarity of the concept and substance of the material Clarity of images, videos, and material graphics Accuracy of assigned tasks
Sentences and Language	Legibility Information clarity Conformity with Indonesian language rules Use language effectively and efficiently
Presentation	Systematic presentation Complete information Communicative Giving motivation

Table 2. Indicator items of instrument for material expert

Aspect	Indicator
Display Design	Composition of text and background colors Layout Synchronization of graphic illustrations with visuals and verbal Title Clarity Design attractiveness
Ease of Use	Systematic presentation Ease of operation Navigation function
Usability	Ease of teaching and learning activities Ease of interaction with the module Attract students' attention
Consistency	Consistency in the use of words, terms, and sentences Consistency in the use of fonts Layout consistency
Graphics	Use of color Use of letters Use of illustrations

RESULTS AND DISCUSSION

Result

The developed module follows the steps of the development model, which consists of defining, developing, and evaluating. At the define stage, a needs analysis is carried out, which consists of problem analysis, curriculum

analysis, and analysis of student characteristics. The module design is based on the previous step's analysis results at the development stage. The next stage, namely the evaluation stage of the e-module design that has been made, is assessed by the validator to see the validity of the developed product.

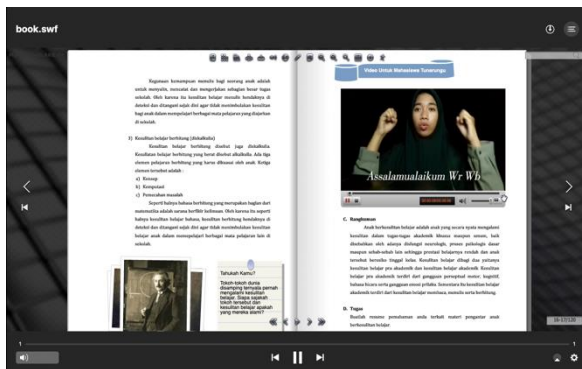


Figure 1. E-Module Page

The data on the validity of the modules were obtained from the validation sheets given to each of the two validators who validated the content aspect and the module from the media side. Content validation comprised content elements, sentences and language, and presentation feasibility. The average content validation result is 88.3% and is included in the excellent category.

Table 3. The Result of the Content Validity Test

No	Aspect of Validation	Score of V1	Score of V2	Average Score
1	Content Eligibility	90,7	86,7	88,7
2	Sentences and Language	89,3	83,3	86,3
3	Presentation	91,1	88,9	90
Average Score				88,3

Furthermore, the validation of the media module has five aspects, namely aspects of screen display design, ease of use, consistency, usability, and graphics. The average guarantee of the five elements based on the assessment of the two validators is 83.7% and is included in the good category.

Table 4. The Result of the Media Validity Test

No	Aspect of Validation	Score of V1	Score of V2	Average Score
1	Display design	82,9	82,9	82,9
2	Ease of use	85,7	82,9	84,3
3	Usability	86,7	80	83,3
4	Consistency	86,7	83,3	85
5	Graphics	85,7	80	82,9
Average Score				83,7

Discussion

This study resulted in an electronic learning module that deaf students can use to increase their learning independence in lecture activities. The development of this product uses procedural development stages based on needs analysis so that the problems contained in lecture activities are known. To overcome the issues that have been identified, then proposed solutions to help overcome these problems. Before the development is carried out, it is necessary to do a background analysis so that the development process can be carried out optimally. The results of the background analysis are used as a reference in the development stage.

In this study, an electronic module was developed to overcome the problem of not meeting the demands of learning, especially the media component for students with hearing disabilities in lecture activities where the use of appropriate media is one of the critical aspects of learning disability (Muspita et al., 2020). Before making the instructional media design, first, carry out some needs analysis of the development that will be carried out. It aims to obtain information about the need for learning media development. The following design step can be carried out effectively by doing a needs analysis consisting of student analysis, background analysis, and analysis of the required learning components.

The lecturing style and emphasis on group discussions in higher education are a concern for deaf students there. According to (Atmajaya, 2018), children with hearing loss have difficulties hearing and speaking; hence, learning materials appropriate for these kids are visual. Even if only a small percentage of deaf pupils are in the class, we may still give them the best education possible by using various teaching techniques.

For instance, different teaching approaches can incorporate visual media and videos with subtitles into lectures. The range of teaching techniques and media will benefit all students, not only those with specific needs and those who learn best visually. According to (Anggrellanggi et al., 2020), students with special needs, such as those who are deaf, can more fully engage in learning through the media modification approach because they have access to lecture materials again anywhere and everywhere.

University deaf students range in age from 16 and up. Deaf students can already use technology-based learning media such as electronic modules. The early study analyses indicate that deaf students can learn using technology-based learning activities. This is since ICT devices are now commonplace. Based on the results of the needs analysis that has been carried out, it is concluded that the electronic module learning media can be developed because it meets the requirements or criteria for setting the expected learning media. The electronic module that will be developed considers the learning needs of deaf students.

After the needs analysis, the next step is planning the design of learning modules that deaf students can use. To produce a valid learning module, the development stage needs to be based on the components of the learning model. Learning media for deaf students is media that emphasizes visuals (Nugroho & Mareza, 2016). So the development of the electronic module in this study is also based on these components. The modules are structured based on a module framework modified by (Yulando et al., 2019) that contains instructions for use, initial ability checks, materials, assignments, and quizzes. The module is equipped with text, images, and learning videos accompanied by subtitles and sign language, according to the learning needs of deaf students. Based on the results of the validity test given by the expert, it can be concluded that the product developed has a validation value with an excellent category.

Electronic learning modules have many advantages. Some of the practical uses of this learning module are: that deaf, disabled students can study subject matter independently and repeatedly and have a better understanding because the presentation of the material is adjusted to their needs. Electronic modules support learning anywhere and anytime (Agustina et al., 2020; Hamid et al., 2020; Imran et al., 2022; Perdana et al., 2017) to increase learning independence for students with hearing impairments. The developed module can help deaf students learn independently according to their needs, as the learning modules must be self-instructed, self-contained, stand-alone, adaptive, and user-friendly (Daryanto, 2013). This research has been carried out until the product validation stage. Furthermore, a trial will be conducted on the subject directly to use the learning module that has been developed.

CONCLUSIONS AND SUGGESTIONS

The development of e-modules is carried out to create a learning media that can support student independence in learning activities and increase learning effectiveness. Using e-modules can help educators change the learning paradigm toward student-centered learning. The developed e-module is valid to be used as an instructional media in learning activities for students with hearing impairments. It is suggested that educators be able to use e-module as one of the media in learning activities to increase student independence in learning.

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