

Blended Learning Model for Deaf Students on Developing Critical Thinking in Higher Education

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ABSTRACT

The use of technology in learning can develop skills and provide separate learning support for children with special needs such as deaf children who are enrolled in higher education institutions. One of the skills that can be realized with the involvement of technology is critical thinking, which is one of the expected skills in the 21st century. To meet these demands, learning activities must of course continue to adapt to technological developments and be designed to meet needs and characteristics. Technology-based learning innovations can be realized in a instructional model. One of the technology-based instructional models that are currently widely used is the blended learning model which is the best pairing of face-to-face and online learning. This instructional model supports students to learn more actively and independently and requires students to be skilled at adapting to technology. This development research aims to produce a mix learning model to improve the critical thinking skills of deaf students in higher education. The development is carried out using the 4D model which begins with the define stage by conducting a needs analysis, design and development.

Keywords: *Blended learning, Critical Thinking, Deaf*

1. INTRODUCTION

About 5% of the world's population (432 million adults and 34 million children) has impaired hearing loss, or 466 million people. Over 900 million individuals, or one in every ten individuals, are predicted to have crippling hearing loss by 2050. Deafness is a hearing impairment in which an individual is unable to obtain auditory information. Many deaf people are also speech-impaired, thus they communicate primarily through sign language (SL). Instead of sound patterns, facial expressions, lip patterns, hand signs, and body language are all used in sign language. Sign languages differ between countries. As with spoken languages, they have their own grammar and vocabulary. They differ even within the same country, and There is no such thing as a universal sign language. [1]. They also have higher rates of grade loss and a greater need for education assistance. Access to adequate accommodation is vital for an effective learning experience but is not always available [2].

Critical reading is more than just understanding text. It is working to figure out and interact with the many layers of ideas and language in an academic text. It also involves questioning the authority of a text. The end result is the analysis of what an author said, how he expressed it, why he expressed it, and the future application of the text to

past and future learning. Inability of many Deaf students to read critically in their writing courses. Inability of students to apply information from their reading to their writing assignments or to other disciplines. His or her ability to think critically is important to the student's success in school as well as in the workforce. Higher-level thought skills, such as problem-solving, implementation, synthesis and assessment, are central to student intellectual development [3]. As educators, we should expect students to participate in as much high-level cognitive work as possible during preparation. Students should have several opportunities per class period to complete cognitively challenging assignments. All students can and should be engaged in critical thinking applications. Students should not be constrained by language disorders, learning difficulties and restricted awareness of subject matter. Critical thinking is a crucial component of 21st century skills and a basis for the Common Core Learning Standards (CCLS). We need to teach them how to think on their own, in order to prepare all students for college and careers. For their understanding of creating sense from abstract concepts, young learners need to be entirely accountable [4][5].

In terms of accommodation strategies and procedures for students with disabilities, higher education programs

are not well organized. In fact, universities are also not equipped when disabled academics return to the faculty. The majority of them are particularly vulnerable to the special access requirements of deaf or hard-of-hearing academics. This may bring occupational barriers to jobs and tenure, as well as potential diversity losses on campuses. In addition to policy guidelines and campus practices aimed at ensuring career success for deaf and hard of hearing faculty, a history and substantiation of this access issue is provided [2]. Critical thinking is not a privilege, but a necessity that must not be ignored. One of the best experiences for higher education students is to have the ability to think openly and to challenge other students with their own ideas. The goal of higher education is to teach and improve the critical thinking abilities of learners [6].

The inclusion and involvement of students in the collaborative learning process is rapidly becoming a core topic in higher education [7][8]. One of the most neglected aspects of education, typically comes to the fore with inclusion and involvement [9][10]. Todd Kettler [11] research experiences with affection is mentioned. It originated in the context of a participatory action research project in which, in a blended learning environment sponsored by Moodle, they discussed pedagogical participatory methods, personal and collaborative. This key goal was to explore new ways of improving the representation and involvement of higher education students in their own learning and assessment [3][12]. Teachers and administrators need to understand just what critical thought is and is not perceived to be. They need to consider what the aims of the learner include, and what it looks like, as both direct guidance and infusion into the content of the course. Teachers need clear examples of how analytical thinking in their field of content can be taught and assessed. In addition, in studies where managers monitored lesson plans for use of critical thinking and observed classrooms explicitly looking for critical thinking, teachers were more consistent in implementation and students made greater improvements in critical thinking skills [11][13].

In these fields, many innovative technologies have lately been invented. In this instance, we must assist deaf persons by converting their learning materials into sign language using e-learning technology. For deaf persons, a shared electronic network of user-friendly multimedia, telecommunications, and internet information technologies is utilized to assist distant, lifelong, and ongoing education procedures. In Indonesia, only a limited number of organizations apply the e-learning approach to deaf communities. There are only a few higher education institutions using the e-learning system due to lack of telecommunications facilities, multimedia technologies and high implementation costs. So that we

may use the e-learning methodology to help deaf persons improve their learning skills. E-learning is used without leaving face-to-face learning, because learning in the classroom is also very important for deaf students to stay in touch and socialize with their environment. So, the best approach is to combine the two learning models known as blended or mixed learning. The syntax of blended learning for deaf people who use sign language in higher education institutions in Indonesia is presented in this research.

2. MATERIALS AND METHODS

This research includes research that will develop and produce a product in the form of a blended learning model designed for deaf children with hearing impairment. The study uses the 4D development model proposed by Thiagarajan et al. This development procedure involves four stages, consisting of the phases of define, design, development and dissemination, in accordance with the development model [14][15].

1. Define stage (define)

This stage is completed to develop an understanding of the field's conditions related to the teaching and learning process. At this stage, several needs analysis is carried out such as analysis of the subject matter to be developed, analysis of students characteristics and abilities, and analysis of conditions.

2. Design stage (design)

The activity at this stage is to design an instructional model based on the results analysis of define stage..

3. Development stage (develop)

At this third step, the development and testing of the developed product is carried out to see the validity and practicality of the product.

4. The stage of dissemination (disseminate)

At this stage the product being developed is disseminated.

The research subjects were deaf students in the Department of Special Needs Education, Universitas Negeri Padang. The instruments used to collect data in this study are as follows the validation sheet used to assess the validity of the product developed and the observation sheet for the practicality of the product. Descriptive data analysis methods were used to interpret the research data, in particular by illustrating the validity, practicality and efficacy of the product being developed.

3. RESULTS AND DISCUSSION

Syntax Model

Syntax is a set of activities for learning that are represented in a series of activities called stages. Each model therefore has simple and distinct stages to be

implemented. In this model, online learning serves as a supplement to face-to-face learning, which will be used to provide content and practical questions. Students can access anything, anywhere and at any time, through the Internet. The model proposed in this blended learning scheme is arranged in the form of a syntax model scheme. The model syntax is a sequence of learning activities that are described into a series of activities called stages. Each model has clear and different stages so that it can be applied according to needs. The blended learning model in learning has an online learning and face-to-face learning level. The steps of the blended learning model consist in the search for information, the acquisition of information and the synthesis of knowledge.

The learning stages in face-to-face meetings are as follows:

Table 1. Face-to-Face Learning Stages

No	Program
1	The lecturer arranges the class in order to put deaf students in front of the class or in the most obvious location to see the lecturer and the presentation screen
2	Lecturers convey learning objectives, perceptions with the help of presentation media so that normal students and deaf students can understand
3	Lecturers can deliver material with various options such as providing a sign language interpreter, explaining slowly and assisted with presentation slides

4	The deaf student was given the opportunity to ask questions and reply by writing to the lecturer while discussing.
5	Lecturers evaluate and conclude together the learning that has been taking place with students
6	The lecturer asks students to study material on the web for the next meeting

The learning stage in online learning is as follows:

Table 2. Online Learning Stages

No	Program
1	The lecturer arranges the class in order to put deaf students in front of the class or in the most obvious location to see the lecturer and the presentation screen
2	Lecturers convey learning objectives, perceptions with the help of presentation media so that normal students and deaf students can understand
3	Lecturers can deliver material with various options such as providing a sign language interpreter, explaining slowly and assisted with presentation slides
4	The deaf student was given the opportunity to ask questions and reply by writing to the lecturer while discussing.

Based on face-to-face sequences and online learning model, this figure show blended model:

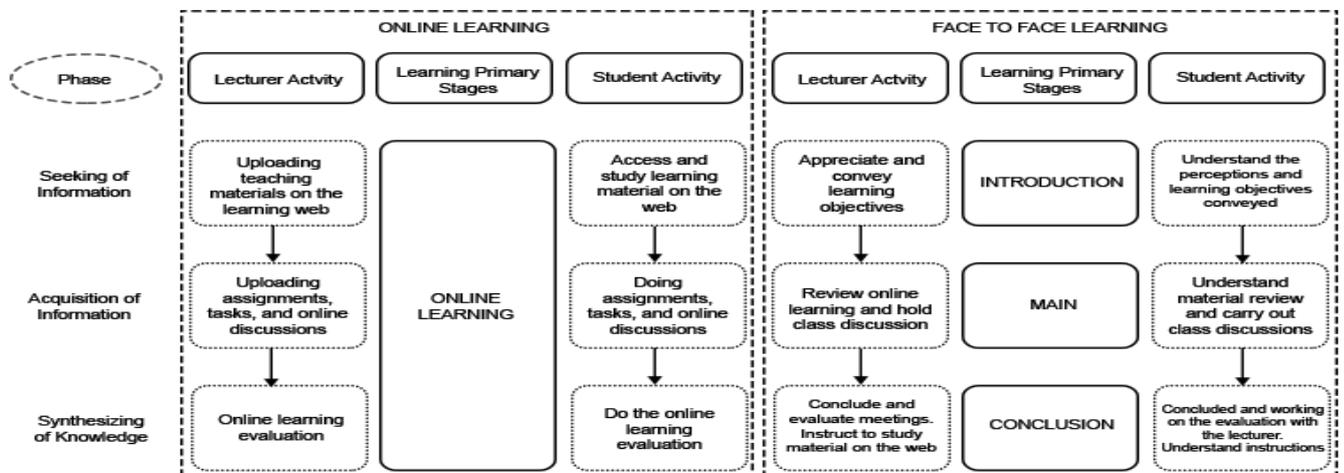


Figure 1. Blended Learning Model Syntax

Social System

The social system of the blended learning model is an integration of communication between lecturers and students. The interaction between lecturers and students is an important learning activity to achieve learning objectives. If it is correlated with experiences in learning, the social interaction dimension is the relationship between lecturers and students. The components of social interaction are that job is the link between lecturers and students. Teachers teach, guide and direct students while students learn, so that the learning process shows a social relationship between them. The interaction in question occurs when the lecturer encourages students to access the learning web, and the students do so. In this case the interaction grows between students and teaching materials contained in the learning web.

Principle of Reaction

The application of the blended learning model is often seen on the basis of the main reaction, namely how lecturers attitudes towards learners are. It is almost the same as the social structure, i.e. synchronization in the performance of their respective functions. If the social system explains the role of each teachers and student, how to fulfill each other's roles is determined by the concept of reaction. For instance, when a lecturer welcomes students when he enters the class, the greeting will be answered.

While the lecturer discusses some material in the blended learning model, students listen to it carefully; while students ask, the lecturer answers the question. The reaction principle of the blended learning model is manifested in the form of the rules of learning. For example, rules for online learning, rules for face-to-face learning, rules for students who complete assignments on time and late, rules for online discussion agreements, and rules for how teachers conduct themselves in each phase of blended learning.

Support System

The support system is an important aspect and has a strategic role in developing a blended learning model for students with hearing impairment. Since educators may provide distinct learning according to their needs in this section of the learning model. Based on the features and outcomes of the needs study, an online / e-learning platform comprising the following materials is the key support framework in this model:

- a. The learning material is in the form of a video with Indonesian subtitles
- b. Sign language learning materials
- c. The learning material is in the form of an attractive video presentation

Table 3. Blended Learning and Critical Thinking Models

Phase	Learning Activities	Blended Learning Aspects	Critical Thinking Indicators
Seeking of Information	Provision and search of information from various sources available both online and in face-to-face meetings	Live event Self paced learning Performance support material	Asking ability Ability to answer questions
Acquisition of Information	Lecturers guide students in group discussions to inventory information both face-to-face and in online learning Lecturers give assignments to see students' abilities in applying the information obtained	Live event Self paced learning Performance support material Collaboration Assessment	Asking ability Ability to answer questions Solve the problem
Synthesizing of Knowledge	The lecturer reviews the results of the concept acquisition from students and together concludes the concepts being	Live event Collaboration Performance support	Make a conclusion Skills to evaluate and assess the

	<p>taught.</p> <p>Lecturers help students incorporate knowledge in their cognitive structures. Lecturers assist students in their reconstruction by guiding them through the process of accommodation and assimilation, which begins with the results of analysis, discussion, and formulation of conclusions based on information learned in-person and online.</p>	<p>material</p>	<p>results of observations</p>
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Discussion

This study produces a blended learning model output design for deaf students in order to enhance their critical thinking skills in lecturing activities. The development of this product uses procedural development stages based on needs analyzes so that there are problems in lecture activities.

The blended learning model built is the model of use of information technology, in particular the internet, in lecture activities to facilitate face-to-face learning in the classroom. The aim of the blended learning model is to develop student critical thinking skills by providing a learning model that meets their needs. Learning using a blended learning model will enhance students critical thinking skills [12]. This technology-based learning model, especially the internet which has been adapted, is the web enhanced course model which is the use of the internet as an addition or enrichment for face-to-face learning [18].

The development stage needs to be focused on the components of the learning model to create a reliable learning model. As Joyce and Weil have explained, there are several components of the learning model consisting of syntax, social systems, reaction principles and support systems [19]. The implementation of a blended learning model in this study is also based on these components. On the basis of the results of the validation test submitted by the expert, it can be concluded that the product produced has a very valid validation value.

Validity data for the blended learning model was obtained from the validation sheet given to two validators who validated the component aspects of the learning model consisting of syntax, social systems, reaction principles and support systems. The results of the assessment of the two validators can be described in the following graph:

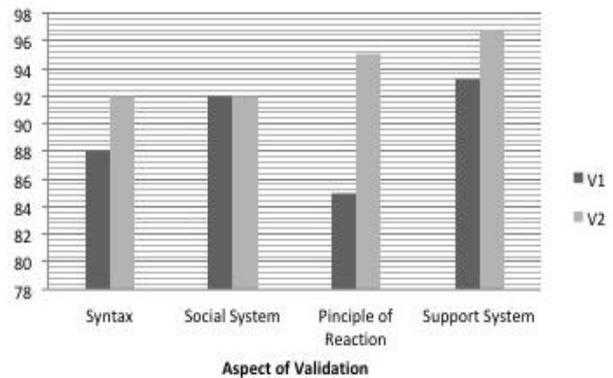


Figure 2. Validation Assessment Results

Figure 2 shows that the first validator gave an assessment of 88% for the syntax aspect, 92% for the social system, 85% for the assessment of the reaction principle component and 93.3% for the support system. So that the average assessment of the first validator for the blended learning model design developed was 89.6% with a very valid category. From the second validator, the results of the assessment for the syntax and social system aspects were 92% respectively, the reaction principle aspect was 95% and the support system assessment was 96.7%. The average validation result for all components of the blended learning model from the second validator is 94% with a very valid category. Thus the average validation result obtained from the two validators is 92%.

4. CONCLUSIONS

The development of the blended learning model is carried out to create a learning model that can help lecture activities both from the side of lecturers or students who have hearing impairments to accomplish the planned learning objectives. Through the development of this instructional model, it can help deaf students to get

learning that suits their needs. Students critical thinking skills do not tend to develop by accident or mere time spent in school. Instead, improved student thinking performance is associated with an intentional approach that combines direct instruction in discrete critical thinking skills and a curriculum that requires students to apply those critical thinking skills to the learning of concepts, issues, and ideas in specific content curricula. Furthermore, teachers need both initial and ongoing professional learning in critical thinking, and administrators need training and tools to support the fidelity of the instructional program.

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