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Blended Learning Design to Support Differentiated Learning: A Case Study for Students with Disability

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Abstract: Blended learning has been gaining attention in recent years as a method of instruction that combines online and offline learning experiences. This approach can potentially support differentiated learning for students with disabilities, who often require individualized instruction and accommodations. The purpose of this paper is to describe how the blended learning models can be used to support differentiated learning needed by students with special needs in higher education. This study is a qualitative case study. Data was obtained through observation, literature study, documentation and interviews with students and experts on the appropriate learning models for students with disabilities to be implemented in higher education. The findings of this research are in the form of a learning model design with a combination of face-to-face and online lectures through appropriate technology to support differentiated learning for each student with disabilities.
Keywords: blended learning; differentiated learning; students with disability.

INTRODUCTION

The number of students with disabilities attending higher education has gradually increased every academic year (HESA, 2023). Various categories of disabled students registered in higher education consist of those with visual, hearing, physical and students with specific learning difficulties. With this diversity of enrolled students in higher education, universities, as inclusive educational institutions, must provide accessible learning for all.

During the covid-19 pandemic, there has been a tremendous increase in higher education institutions using online and blended learning systems for their courses (Hong et al., 2021; Podsiadlik, 2021). This instruction is achieved through the integration of technology into the education system. Higher education institutions are incorporating online instruction into face-to-face learning, utilizing tools such as learning management systems, class websites, electronic portfolios, and even social media platforms like Padlet, YouTube, and Instagram.

Blended learning is a teaching method that combines traditional classroom instruction with online learning (Alamri & Tyler-Wood, 2017; Fazal et al., 2020; Pham et al., 2021). It is a flexible approach that allows face-to-face interaction, self-paced learning, and technology-based instruction. Blended learning aims to create a personalized learning experience that caters to the unique needs of each student. This approach is instrumental in supporting differentiated learning for students with disabilities, as it can provide a range of instructional strategies and materials tailored to meet this student population's diverse needs.

Differentiated learning in inclusive schools is centered on the needs of instructors in differentiating learning so that the needs of various students are fulfilled (Brodersen & Melluzzo, 2017; Marlina et al., 2019; Palahicky, 2014; Suprayogi et al., 2017). This approach allows the teacher to adapt the learning components to suit the needs of each student. Some of these components such as learning plans, products, assignments, exams,

media, and materials. In the context of disability this concept is very important to be applied in education. A personalized learning approach can help to ensure that students with disabilities receive adequate and relevant learning that matches their needs. Because students with disabilities have different obstacles and characteristics, so they need different learning that is adapted according to their respective needs. For example, the teacher may need to use sign language for learning to students with hearing impairment. The goal of differentiated learning is to maximize each student's growth/progress and different success by adjusting each learner (from where he or she is) and assisting in the learning process (Dapa & Undap, 2023).

Students with disabilities frequently require tailored training that takes into account their particular strengths, problems, and learning styles (Utami et al., 2020). Blended learning can give a variety of resources and methods to help engage and inspire these students in their learning, such as multimedia presentations, interactive activities, and virtual simulations. Furthermore, employing online learning platforms allows for better scheduling and pacing flexibility, which can benefit students who may need extra time or support to understand new ideas.

Students with disability require individualized training that take into consideration their specific strengths, challenges, and learning style (Utami et al., 2020). Blended learning can provide students with a variety tools and strategies to engage them, such as multimedia presentations, interactive activities, and virtual simulation. Furthermore, using online learning platform provides for greater scheduling and pacing flexibility, which can benefit student who may require extra time or assistance to understand new concept.

When implementing blended learning for students with disability, it is important to consider each student's specific needs, as well as the available technology and resources. Collaboration among teachers, parents, and special education experts is also essential to ensuring that the blended learning method is suited to each student's specific needs. Educators may provide a more personalised and effective learning experience for kids with disabilities by employing a blended learning strategy, ensuring their success in school and beyond.

Unfortunately, there is a lack of information on the actual implementation of blended learning by instructors in higher education to provide customized instruction. This issue is critical because blended learning has the potential to address several challenges that hinder personalized instruction in traditional learning settings, including large class sizes or limited time (Nicolae, 2014; Tomlinson et al., 2003). Therefore, this study aims to investigate how instructors in higher education use personalized instruction, especially for students with disability in a blended learning environment, their approaches to designing blended learning to meet the needs of diverse students, and what are the challenges and issues blended learning experiences by students in the mixed learning system.

METHOD

This study employed a case study approach to describe how the blended learning model can implement differentiated learning, especially for students with disability. The case study is chosen as it is the appropriate research method for addressing the 'how' and 'why' questions, focusing on a contemporary issue within a real-life context (Yin, 2009). The study used non-probability, purposive sampling. The study took place in the academic year 2022/2023 at a university in West Sumatera which used blended learning, with approximately 50% of the face-to-face replaced by online instruction. Six students with disabilities participated in this study. The qualitative data were collected through documentation, observation and interviews. Differentiated learning aspects based on

(Moore, 2014) consist of differences in content, process, product and learning environment. Data were analyzed using triangulation techniques.

RESULT AND DISCUSSION

Result

What are the strategies for differentiation in blended learning

Based on the research results, many ways can be done to provide differentiated learning through the blended learning model. Fulfilling the learning needs of different students can be realized through a combination of face-to-face and offline learning. So that students can get learning that accommodates their differences. The following in Table 1 presents several activities in the blended model that can be carried out by teachers and students based on differentiating learning aspects.

Table 1. Learning activities in the blended model based on differentiated learning aspects

Differentiated Learning Aspects	Learning Activities
1. Content - Provide varied teaching materials - Provide additional support in teaching materials	- Instructors provide various types of material; text-based content, audio-based content, video-based content, video with sign language, video with subtitle - They are providing additional materials on the web to complement face-to-face meetings. - Provide additional activities such as online discussion - Present content in varied ways
2. Process - Whole class interaction - Grouping - Individualized activities	- Instructors give individual activities based on students' characteristic - Instructors facilitates direct and group learning - Provide additional instruction to different student
3. Product - Provide additional support throughout the product development - Provide varied assessment	- Students can choose the form of product that they will collect as an assignment adapting their capabilities, such as allowing visually impaired students to submit works in the form of typed text or audio recordings. - Provide choices and modes of expression - Provide peer and self-evaluation
4. Learning Environment	- maintain a conducive classroom environment - arrange seating positions for visually impaired students - provide sign language interpreters for deaf students. - Accept and appreciate student diversity - Provide accessible tools and systems for online interaction

Challenges and issues experienced by student with disability in the blended learning model

Based on the blended model that has been running, students with disabilities still have challenges and obstacles in learning. And on the other hand, they also stated they had a beneficial learning experience through the blended learning model.

Students with visual impairment

"In face-to-face meetings, I listen to the material from the lecturer, ask questions, and participate in class discussions. Through online learning, I can study the lecture material longer. The challenge in face-to-face learning is that I am sometimes disturbed if my friends beside me are noisy. And the challenge in online education is that occasionally several applications are not accessible to the visually impaired."

Students with hearing impairment

"I can see the movement of the lecturer's lips during face-to-face classes, and online learning helps me to understand better the material that I sometimes find difficult to grasp in face-to-face classes. I can participate in discussions through online learning, read course materials, and watch videos."

Students with physical impairment

"Blended learning allows me not to have to come to campus. I can learn from home through e-learning or web meetings. I have no problems with online learning. I like online learning. My mentality is also healthier because I don't hear insults from others. Hopefully, online learning can be carried out until I finish graduation."

Discussion

Implementing blended learning for students with disabilities can be quite challenging, but it is not impossible. If applied carefully, blended learning can assist students with disabilities. Implementing blended learning is a joint responsibility of every element in higher education institutions (Bates, 2019; Halverson & Graham, 2019). It starts with policymakers who provide accessible facilities and infrastructure and educators' awareness to provide appropriate learning for all students.

Differentiated learning should be applied in the education system, especially for students with disabilities. They need learning services that can accommodate their obstacles. Online learning in blended learning can accommodate these needs. On the other hand, face-to-face learning is still required to form attitudes and social skills that cannot be conveyed through online education.

Blended learning potential, combining online and offline interactions, can provide differentiated learning for students with special needs. Online learning tools and features can supplement what cannot be delivered in face-to-face meetings. Conversely, face-to-face meetings are still needed for students with special needs to obtain materials directly, develop social and communication skills, and shape attitudes.

Some of the conveniences obtained in online learning in blended learning for students with disabilities are 1) learning can be carried out anywhere and anytime, 2) online learning in the blended model makes learning more organized, 3) online learning makes costs more affordable, 4) online learning makes the material accessible repeatedly, 5) Blended learning increases self-confidence. As found (Castro, 2019) digital technologies may improve learning activities. While the weaknesses are 1) Some online learning features are inaccessible for blind people because they cannot be accessed using Talkback and Jaws. 2) Online learning depends on internet access; if there are problems, then learning cannot be accessed. 3) For deaf students, they cannot directly ask the lecturer and colleagues if something is not understood. So, it is essential to consider the form of online learning for a student with a disability.

Some benefits of face-to-face learning are 1) Being able to interact directly with lecturers and classmates, 2) Through face-to-face learning can increase social interaction and build attitudes that cannot be obtained online 3). Face-to-face learning can be communicated directly with lecturers according to disability needs. The weaknesses are as follows 1) Because they depend on audio, blind students need a quiet atmosphere during face-to-face learning, so if there is a noisy place, it will disturb them. 2) Face-to-face learning for deaf students is sometimes difficult to understand because it only depends on the lecturer's lip movements. 3) Deaf students have difficulty having direct discussions, and 4) Deaf students need sign language interpreters to make learning more optimal. As

found (Astuti et al., 2023; Utomo et al., 2023) there are still several barriers to accessibility for students with special needs in face-to-face learning. Based on the explanation above, the two learnings can be combined in blended learning with adjustments based on the characteristics and barriers of each disability. The mixed learning model can make learning individualized for students with disability. Blended learning can be an alternative to faced student demographics in higher education (Medina, 2018; Okaz, 2015)

CONCLUSION

Blended learning has the potential to realize differentiated learning, which is highly needed in higher education to achieve accessible understanding for all, including students with disabilities. Various methods, media, and learning systems in blended learning can help the achievement of students with special needs. But on the contrary, when students' obstacles and individual needs are not considered, blended learning can worsen students' learning experience.

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