

# Innovation in Online Learning and Accessibility for University Students with Disabilities

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## ABSTRACT

The aim of this study was to determine the innovation in learning and accessibility for students with disabilities in the implementation of online learning during the COVID-19 pandemic at one university in Central Java. This study is mixed methods research using a survey approach. The respondents of this research were 20 students with disabilities. The sample was taken by purposive sampling on the basis of their participation in the Study Center of Diffability (PSD). Data collection techniques in this study were conducted through questionnaires (online form) and interviews. The online questionnaire was given to 20 disabled students at one university in Central Java. Meanwhile, the interviews were conducted with one student with visual impairment and one student with hearing impairment. The questionnaire data was analyzed using descriptive analysis techniques, while the interview data were used as additional data to support the questionnaire data. The results of the study indicate that there are still students with disabilities who experience difficulties while attending lectures at universities due to the obstacles faced, namely the lack of development of learning approach innovations to help students with disabilities to participate in the lecture process. The research conducted can run well and is expected to be useful as an effort to improve the quality of special education services in Indonesia, especially in the implementation of inclusive education services.

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## 1. INTRODUCTION

Educational opportunities for children with special needs are increasingly wide open to answer challenges in the implementation of special education services. One of them is the issuance of the Regulation of the Minister of Research and Technology of Higher Education Number 46 of 2017 concerning Special Education and Special Services in Higher Education. It is emphasized that the implementation of special education in higher education aims to improve the quality of education services for students with special needs. As a result of COVID-19 pandemic, many policies have been issued. One of which is a policy for the teaching and learning process in universities. This was stated by the Public Relations of Directorate General of Higher Education of the Ministry of Education and Culture during a press release that online learning is an alternative to modern learning methods where the government has also provided a smart platform and online lectures that can be accessed by students and lecturers. Policies for higher education during the COVID-19 pandemic have also been regulated in a Ministerial Regulation which explains the scope of Distance Education, namely Universities, study programs and courses conducted online.

The implementation of policies from the government for universities, namely online learning, is certainly a new thing and requires a lot of adjustments. Most terms (online learning, open learning, web-based learning, computer-mediated learning, blended learning, m-learning, for example) have a common definition of the ability to use a computer connected to a network, i.e. offer the possibility to learn from anywhere, anytime, in any rhythm, by whatever means" (Cojocariu et al., 2014). Online learning is defined as "a learning experience in a synchronous or asynchronous environment using different devices (e.g., cellular phones, laptops, etc.) with internet access and students can be anywhere (independently) to learn and interact with teachers and other students" (Singh & Thurman, 2019, p.290).

During the COVID-19 pandemic, higher education institutions were more focused on how to adapt quickly to online learning rather than determining methods for providing online learning (Carey, 2020). This is a challenge for general lecturers and students as well as people with disabilities in carrying out online learning. There are still lecturers who have not or even paid attention to students with disabilities. In addition, lecturers still find it difficult to access learning for students with disabilities. This happens because there is no inclusive online learning guide, lack of knowledge about assistive technology that can be used to provide accommodation for blind students when learning online. As a result of the difficulties experienced by lecturers, there are some students with disabilities who find it difficult when participating in online teaching and learning activities in universities.

One of the state universities in Indonesia located in Central Java, has already had a Study Center for Difabel, called Study Center of Diffability (PSD), which carries out activities to improve special education services for students with disabilities both through research activities and community service. In 2018, PSD conducted a study of 20 students with disabilities which showed that students with disabilities had the highest concern about being troublesome to others (66.67%), unable to participate in internship (47.62%), and unable to attend college (28.57%). Even though students have had the opportunity to study at one university in Central Java, they still have concerns about their spouse (23.81%) and work (14.29%). The highest difficulty is when students with disabilities take part in the New Student Orientation Period (42.86%), obstacles to campus facilities that are less accessible (38.10%), when attending lectures, interacting with other student friends, interacting with administrative officers (33.33% ), utilize the library and interact with lecturers (28.57%) (Coman et al., 2020). Based on research conducted by PSD at one university in Central Java, it can be seen that the highest difficulty for students with disabilities is participating in lecture activities such as Student Orientation Period activities, campus facilities that are less flexible and teaching and learning activities or during the learning process. Thus, students with disabilities need innovative learning approaches to assist their lecture process. Thus, this study aims to determine the innovation in learning and accessibility for students with disabilities in the implementation of online learning during the COVID-19 pandemic for students with disabilities at one university in Central Java.

Hejl, (2021), "while college is an exciting time for incoming students, it can be especially stressful for those with disabilities. Without the right support, these students could become overwhelmed with adjusting to new faculty, classmates and challenging coursework. Ninety-four percent of high school students with disabilities receive assistance; however, only 17% of disabled college students take advantage of disability resources. And for those who didn't receive accommodations in college, 43% wished they had." Currently in Indonesia, there are several universities that have provided opportunities for students with disabilities to get education in higher education. Indeed, the accessibility of services is not sufficient, but the university's commitment to providing opportunities for students with disabilities to receive higher education services needs to be appreciated. Furthermore, innovations and regulations must always be developed to be able to provide decent educational services for students with disabilities.

Many studies have been conducted regarding learning for students with disabilities in universities. Research conducted by Manar (2019) found various problems related to the learning process for students with disabilities, namely the learning process in the classroom has not fully accommodated the needs of students with disabilities. Moreover, research by Michael (2020) explained that the implementation of higher education for persons with disabilities has been going well in terms of availability, accessibility, acceptability, and adaptability. Furthermore, there is a research that focuses on media development with the result that students with visual impairments need online learning media that allows them to access learning materials for morphology courses, especially syntactic concepts which have been conveyed through visual concepts. (Nugroho & Harjo, 2021).

Based on previous research, the theme of education for students with disabilities has been studied quite a lot. However, research has not directed at online learning patterns, especially during the COVID-19 pandemic. This research is needed as a means of initial identification as well as a basis for further policy making. The aim of this study was to determine the innovation in learning and accessibility for students with disabilities in the implementation of online learning during the COVID-19 pandemic at one university in Central Java.

## 2. METHODS

The research method should be included in the Introduction. The method contains an explanation of the research approach, subjects of the study, the conduct of the research procedure, the use of materials and instruments, data collection, and analysis techniques.

This research is qualitative quantitative research (mixed methods) using a survey approach. The data to be obtained from this research is data related to learning innovation and accessibility in the implementation of online learning during the COVID-19 pandemic for students with disabilities. Research studies focus on developing learning innovations that are used to accommodate the learning needs of students with disabilities that have been carried out by lecturers. In addition, also to find out the accessibility of services that are already owned by the university.

Thus, this study involved students with disabilities at at one university in Central Java as research respondents. Respondents consisted of 20 students from a total of 37 disabled students at one university in Central Java. Research respondents consisting of 20 students have various disabilities, including visual impairment, hearing impairment, mobility and movement impairment, and autism from various faculties at one university in Central Java. A sample of 20 students from 37 populations of disabled students at one university in Central Java was taken by purposive sampling on the basis of their participation in the PSD at one university in Central Java.

**Table 1.** Profile of Student with Disabilities

| No | Type of Disability     | Class Year | Frecuency |
|----|------------------------|------------|-----------|
| 1  | Tottaly Blind          | 2016       | 1         |
|    |                        | 2018       | 1         |
|    |                        | 2019       | 2         |
|    |                        | 2020       | 4         |
| 2  | Deaf                   | 2017       | 2         |
|    |                        | 2020       | 6         |
| 3  | Physically Handicapped | 2020       | 4         |

Data collection techniques in this study were conducted through questionnaires and interviews. A online form questionnaire in the form of a Google Form© was given to 20 disabled students as respondents to obtain data related to learning innovation and accessibility in the implementation of online learning during the COVID-19 pandemic for students with disabilities at one university in Central Java, which includes student responses to online learning, student's online learning processes, student difficulties in online learning, and student's problem solving in online learning.

Furthermore, interviews were conducted on two disabled students, consisting of one student with visual impairment and one student with hearing impairment. Interviews were used to deepen the questionnaire data. Two students with disabilities who were used as interviewees were part of the 20 students who filled out the questionnaire. Students with visual and hearing impairments were selected as interviewees with the consideration that they have significant difficulties in accessing online learning due to visual and auditory impairments that are directly related to changes in online learning. The questionnaire data was analyzed using descriptive analysis technique, while the interview data were used as additional data to support the questionnaire data.

### 3. FINDINGS AND DISCUSSION

#### 3.1. Student's Response to Online Learning

The following are the results of a survey of 20 students with disabilities in the student's response to online learning aspect. Based on the results of a survey conducted on the student's response to online learning aspect, it was found that 20% of the 20 disabled students agreed and 45% fairly agreed that they were glad to take online lectures. Only 35% of the students were not glad to take online lectures. In addition, it was found that 45% of students agreed and 45% of students fairly agreed that they were able to take online lectures. Only 10% of the students were not able to take online lectures. From 20 students, 45% of students agreed and 35% of students fairly agreed that online lectures were disability friendly. Only 20% of the students said that online lectures were not disability friendly.

**Table 2.** The survey results of the student's response to online learning aspect

| Item                                    | Agree | Fair | Disagree |
|-----------------------------------------|-------|------|----------|
| Glad to take online lecture             | 20%   | 45%  | 35%      |
| Be able to take online lecture          | 45%   | 45%  | 10%      |
| Online lectures are disability friendly | 45%   | 35%  | 20%      |

Meanwhile, the results of interviews with one student with visual impairment and one student with hearing loss indicate that they are fairly glad in participating in online lecture. They are also fairly able of participating in online lecture despite experiencing some obstacles. According to them, online learning that is currently being implemented is friendly enough for students with disabilities, although it is not optimal.

### 3.2. Student's Online Learning Process

The following are the results of a survey of 20 students with disabilities in the student's online learning processes aspect. Based on the survey results that have been carried out in the aspect of the student's online learning processes, it is known that 40% students agreed and 25% students fairly agreed that they were able in participating online lecture well. However, 40% students stated that they were unable in participating online lecture well. Related to the ability of students in understanding the learning material, 50% students agreed and 40% students fairly agreed that they were able to understand the learning material through Power Point. Only 10% students were unable to understand the learning material through Power Point. Related to the student's activeness in expressing opinion/asking in online lecture, 35% students agreed and 55% students fairly agreed that they were active in expressing opinion/asking in online lecture. Only 10% students stated that they were inactive in expressing opinion/asking in online lecture.

Related to the lecturer's understanding regarding the problem of students with disabilities in online lecture, 50% students agreed and 10% students fairly agreed that the lecturers understand about the problem of students with disabilities in online lecture. However, 40% students stated that the lecturers did not understand about the problem of students with disabilities in online lecture. Related to the speed of lecturers in delivering the learning material, 40% students agreed and 25% students fairly agreed that the speed of lecturers in delivering the learning material were appropriate. However, 35% students stated that the speed of lecturers in delivering the learning material were not appropriate or too fast.

Related to the friend's support for students with disabilities in online lecture, 75% students agreed and 25% students fairly agreed that they were active in expressing opinion/asking in online lecture. No student stated that their friend did not support and help them in online learning.

**Table 3.** The survey results of the student's online learning processes aspect

| Aspect   | Item                                                                         | Agree | Fair | Disagree |
|----------|------------------------------------------------------------------------------|-------|------|----------|
| Student  | Ability in participating online class well                                   | 30%   | 30%  | 40%      |
|          | Ability in understanding material through Power Point                        | 50%   | 40%  | 10%      |
|          | Student's activeness in expressing opinion/asking                            | 35%   | 55%  | 10%      |
| Lecturer | Lecturer's understanding regarding the problem of students with disabilities | 50%   | 10%  | 40%      |
|          | The appropriate speed of lecturers in delivering the learning material       | 40%   | 25%  | 35%      |
| Friend   | Friend's support for students with disabilities                              | 75%   | 25%  | 0        |

Based on the results of interviews with one student with visual impairment and one student with hearing impairment, students felt that they were able to participate in online lecture activities, despite experiencing some problems. They are still able to understand the lecture material which is usually delivered through Power Point by the lecturer. In addition, students with disabilities also continue to show their activeness in participating in online lectures by giving opinions or asking questions. One of the things that make them able to take online lectures well is the support and help from friends. Some lecturers also support students in participating in online lectures. Some lecturers have understood their condition so as to provide appropriate learning accommodation for students with disabilities during lectures. However, there are some lecturers who do not understand their condition so that they have not provided appropriate learning accommodation for students with disabilities during lectures. Some lecturers sometimes speak too fast, making it difficult for students with hearing impairments to read the lecturer's lips.

The student with visual impairment said that the student had difficulties in implementing online learning during the lecture process, this happened because students with visual impairments had

difficulty accessing the zoom application, students with disabilities needed longer time to access online learning system, called Sistem Pembelajaran Daring (SPADA), and the screen reader on laptop has limitation to access everything on the laptop such as material in the form of images on powerpoint. The student with hearing impairment also experienced obstacles during the lecture process since the student has difficulty by presenting via zoom because they have to hire a Sign Language Interpreter and lecturers are still too fast in explaining the material so that students with hearing impairments has difficulty in reading the lecturer's lips.

### 3.3. Student's Difficulties in Online Learning Aspect

Based on the results of research using surveys and interviews, it can be seen that students with disabilities can take online lectures even though not optimal. There are still students with disabilities who have difficulty participating in the online lecture process. Constraints experienced by students with disabilities in online lectures are mainly related to their disability conditions which make it difficult for students to access online lectures. The study conducted by (Catalano et al., 2021) has described that in the era of the Covid-19 pandemic, disable students have been recognized with various difficulties because of e-learning.

The following are the results of a survey of 20 students with disabilities in the student's difficulties in online learning aspect. Based on the survey results that have been carried out on the aspect of student's difficulties in online learning, it is known that 45% students agreed and 30% students fairly agreed that they had difficulty in following the lecture process using symbols/pictures/graphics/ mathematical formulas. Only 25% students stated that they did not have difficulty in following the lecture process using symbols/pictures/graphics/ mathematical formulas. Related to the college assignments, 10% students agreed and 30% students fairly agreed that they had difficulty in doing college assignments. Meanwhile, 55% of students with disabilities said they did not have difficulty in doing assignments. Related to homework, only 10% of students stated that they need help of others to do their homework. Meanwhile, 40% students agreed and 50% students fairly agreed that they do not feel difficulty in doing their homework independently.

**Table 4.** The survey results of the student's difficulties in online learning aspect

| Item                                                                                         | Agree | Fair | Disagree |
|----------------------------------------------------------------------------------------------|-------|------|----------|
| Difficulty following class material using pictures/ graphics/ formulas/ mathematical symbols | 45%   | 30%  | 25%      |
| Difficulty in doing college assignments                                                      | 10%   | 35%  | 55%      |
| Difficulty in doing homework without the help of others                                      | 10%   | 50%  | 40%      |

Based on the results of interviews with one student with visual impairment and one student with hearing impairment, students feel that they are still experiencing some difficulties in participating online lectures. Students with visual impairments have difficulty in understanding lecture material that uses pictures, graphs, formulas, and mathematical symbols because they are less able to imagine it in their minds. Meanwhile, students with hearing impairment had less difficulty in understanding lecture material that uses pictures, graphs, formulas, and mathematical symbols. Students with hearing impairment have more difficulty in understanding what the lecturer says that is not contained in the Power Point material. Furthermore, students do not experience difficulties in doing the task as long as a clear explanation of how the task should be done has been given. In addition, they also have no difficulty in doing their homework. Sometimes they need the help of friends in doing their homework, but more often they do their homework independently.

### 3.4. Student's Problem Solving in Online Learning Aspect

The following are the results of a survey of 20 students with disabilities in the student's problem solving in online learning aspect. Based on the survey results that have been carried out in the aspect of student's problem solving in online learning, it was found that 100% of students agreed that they asked friends if they had difficulties, 65% agreed and 10% quite agreed that they would convey their difficulties to the lecturer during online learning, and 74% said they did not agree that they were accompanied by their parents.

**Table 5.** The survey results of the student's problem solving in online learning aspect

| Item                                            | Agree | Fair | Disagree |
|-------------------------------------------------|-------|------|----------|
| Asking a friend if there is a trouble           | 100%  | 0    | 0        |
| Addressing online difficulties to lecturers     | 65%   | 10%  | 25%      |
| Assistance of parents while attending lecturers | 21%   | 5%   | 74%      |

Based on the results of interviews with one student with visual impairment and one student with hearing impairment related to the way they did when they were having difficulties in online lectures, they would ask friends for help if they had difficulties or problems in online lectures. They will also sometimes notify lecturers if they are having difficulties in online lectures. They will ask the lecturer to help their difficulties if their friends cannot help their troubles. Meanwhile, they very rarely ask their parents for help regarding academic problems. It is because parents also don't really understand the problems related to lectures so they can't really help their difficulties.

Based on the results of research using surveys and interviews, it can be seen that students with disabilities can take online lectures even though not optimal. There are still students with disabilities who have difficulty participating in the online lecture process. Constraints experienced by students with disabilities in online lectures are mainly related to their disability conditions which make it difficult for students to access online lectures. The study conducted by Catalano et al., (2021) has described that in the era of the Covid-19 pandemic, disable students have been recognized with various difficulties because of e-learning.

Accommodation and learning support for students with disabilities provided by lecturers during online lectures are also not optimal. This is due to the lack of accessibility factor to support online learning since lecturers are still unable to provide the accessibility needed by students with disabilities. Catalano et al., (2021) stated that it has been determined that students with disabilities face different issues with e-learning because they were not having access to the resources required to access the learning material and they were not having sufficient level of support from their mentors and teachers to have sufficient level of learning from their respective educational institutes. Furthermore, disabled students were also facing different issues to grasping a sufficient level of understanding from the lectures that were prepared for them because the teachers were having different issues in developing the lectures that could be used accordingly for teaching disabled students (Mohammed Ali, 2021). Tonks et al., (2021) also stated that the teachers were not having a sufficient level of training that could be used for teaching the disabled students by which different issues arise and the desired level of learning is not done by the students having disabilities.

Moreover, the issues associated with the transition from physical to the online environment also cause different issues for the students having disabilities. The facilities provided in the respective educational institutes were not present at their homes by which different issues arise and the process of learning was not done in the desired manner. Furthermore, the international students having disabilities were not able to cope with these uncertainties and these aspects also produces an impact on e-learning. Besides this, different financial issues were also there because the disabled students have to buy new devices to attain a sufficient level of learning through online mediums. All these aspects result in different barriers for the disabled students and it also results in different barriers for

the teachers to provide a sufficient level of learning to the disabled students (Coleman-Jensen, 2020; Rabbitt & Smith, 2021).

In addition, students also experience difficulties in the online lecture process because they find it difficult to adapt to the online media used such as the zoom application and SPADA where students with visual impairments require longer time to operate the application. Students have difficulty following the lecture process due to lack of self-adjustment skills and lack of inclusiveness by lecturers and peers (Baker et al., 2008; Dowrick et al., 2005; Yssel et al., 2016).

In addition, this is in line with research conducted by Getzel & Thoma, (2008) that students with disabilities experience difficulties in lectures due to a lack of self-advocacy, namely the lack of students knowing their own needs and direct themselves to face the problems that exist. This condition is in line with the results of research by Paulsen and McCormick, (2020) which shows that the characteristics and positive attitudes of students determine the success of online learning more than the online learning model itself. Furthermore, student persistence is important for students, faculty, and universities and online faculty mentoring supports student persistence to graduation. It is crucial to find ways to increase persistence and graduation especially given the increased use of virtual learning during the COVID-19 pandemic (AuCoin & Wright, 2021).

The difficulties faced by students with disabilities can be overcome by developing the competence of teachers in higher education so that teachers can develop methods and innovate appropriate learning for students with disabilities. This is in line with research conducted by Fleming et al., (2017)) which states that one of the keys to the success of students with disabilities in graduating in college is the role of teaching staff in universities. Mohammed Ali, (2021) also stated that more needs to be done as it relates to the training of teachers of special needs students in the use of the technologies and providing the appropriate equipment so that student with disabilities are not further disadvantaged.

In addition, Almarghani and Mijatovic, (2017) suggest that the learning climate, approaches, and methods used during the teaching and learning process greatly affect students as a form of student academic support. In addition, research conducted by Fleming et al., (2017) stated that developing learning strategies is the main goal to support students with disabilities so that academic development in higher education can run well. Meanwhile, (Cavanaugh et al., 2013) explained that there are five important things that need to be considered in online learning for students with disabilities, namely learner control, a flexible and strict curriculum, a safe climate, caring communities, and relationships with students as individuals and their future goals.

Thus, learning innovation should be done in higher education to accommodate student with disability. Educational innovation is understood as an educational procedure or method that differs significantly from established practice and is used to increase the level of efficiency in a competitive environment. Educational innovations include pedagogical innovations, scientific and methodological innovations, educational and technological innovations. It is evident that the education market is one of the most important elements in the national innovation system. Colleges that have chosen innovation-based development, become competitive leaders in the education market (Mykhailyshyn et al., 2019).

Support and assistance in online learning, especially for students with disabilities, is also very necessary to support the success of online learning. Findings from the study of (AuCoin & Wright, 2021) also indicate belief that mentoring and encouragement from faculty would enhance students' scholarly experience. Students indicated they would like to participate in a faculty mentoring program, and it was clear that students welcome and appreciate the opportunity to further cement a professional relationship between themselves and faculty. Furthermore, Mohammed Ali, (2021) also state that there are several recommendations for the successful application of online learning during the pandemic for special needs students. Most suggested the need for adequate educational resources within the departments, and appropriate software and hardware to enable teaching appropriate skills to the learners with disabilities.

#### 4. CONCLUSION

Based on the results of research and discussion, it can be seen that students with disabilities can take online lectures even though not optimal. It is because there are still some difficulties and obstacles experienced by students with disabilities in online lectures. Constraints experienced by students with disabilities in online lectures are mainly related to their disability conditions which make it difficult for students to access online lectures. In addition, accommodation and learning support for students with disabilities provided by lecturers during online lectures are also not optimal. Thus, an innovative learning approach is needed that can assist the accessibility of students with disabilities during online lectures so that they can participate in online learning more optimally. Therefore, guidelines related to innovative learning approaches and accessibility for students with disabilities in participating in online learning need to be compiled. Furthermore, the guideline can be a guide for lecturers in providing learning accommodation for students with disabilities in participating online lectures. With this guideline, it is hoped that lecturers can carry out online learning that is friendly for students with disabilities and students with disabilities can participate in online learning optimally. One of the limitations of the study was perhaps the small number of the respondents. Future studies could explore this phenomenon further, using more respondents.

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