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The Use of Assistive Technology in Helping Deaf Students Achieve Success at UNS

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ABSTRAK

Penelitian ini bertujuan untuk mengetahui apakah penggunaan teknologi asistif membantu mahasiswa tunarungu mencapai prestasinya. Penelitan ini menggunakan pendekatan deskriptif kuantitatif. Sampel dalam penelitian ini berjumlah 21 mahasiswa tunarungu FKIP UNS dan sampel diambil dengan menggunakan Teknik sampel jenuh. Validitas dihitung menggunakan validitas isi dengan rumus Aiken's V. Teknik pengambilan data dengan kuesioner (angket) tertutup. Analisis data dihitung dengan menggunakan deskripif persentase. Hasil analisis data menunjukkan bahwa pada item nomor 1, sebanyak 71% mahasiswa tunarungu mengalami kesulitan dalam mencapai prestasi akademik selama proses perkuliahan. Pada item nomor 2, sebanyak 52,4% mahasiswa menyatakan bahwa kesulitan utama yang mereka hadapi adalah memahami penjelasan dosen. Selanjutnya, pada item nomor 3, sebanyak 71,4% mahasiswa mengatasi kesulitan tersebut dengan meminta bantuan teman dengar. Pada item nomor 4, ditemukan sebanyak 90% mahasiswa tunarungu menggunakan teknologi asistif dalam proses perkuliahan. Item nomor 5 menunjukkan 76,1% mahasiswa menggunakan transkripsi instan sebagai bentuk teknologi asistif yang paling banyak dipakai. Sementara itu, pada item nomor 6, sebanyak 33,3% mahasiswa menyatakan bahwa mereka selalu menggunakan transkripsi instan. Pada item nomor 7, sebanyak 90% mahasiswa tunarungu berpendapat bahwa teknologi asistif membantu mereka dalam mencapai prestasi akademik. Namun demikian, pada item nomor 8, sebanyak 76% mahasiswa mengaku masih mengalami kendala dalam penggunaan teknologi asistif. Item nomor 9 mengungkapkan bahwa 76,1% mahasiswa menyebutkan kendala yang sering terjadi adalah suara yang tidak masuk/tidak jelas. Terakhir, pada item nomor 10, sebanyak 66,7% mahasiswa tunarungu mengatasi kendala tersebut dengan meminta bantuan teman dengar. Pada penelitian ini ditarik kesimpulan bahwa teknologi asistif membantu mahasiswa tunarungu dalam mencapai prestasinya

Kata kunci: *Mahasiswa Tunarungu, teknologi asistif, pencapaian prestasi*

ABSTRACT

This study aims to determine whether the use of assistive technology helps deaf students achieve their achievements. This research uses a quantitative descriptive approach. The sample in this

study amounted to 21 deaf students of FKIP UNS and the sample was taken using saturated sample technique. Validity is calculated using content validity with Aiken's V formula. Data collection techniques with a closed questionnaire (questionnaire). Data analysis was calculated using percentage descriptive. The results of data analysis showed that in item number 1, 71% of deaf students experienced difficulties in achieving academic achievement during the lecture process. In item number 2, 52.4% of students stated that the main difficulty they faced was understanding the lecturer's explanation. Furthermore, in item number 3, 71.4% of students overcame these difficulties by asking for help from hearing friends. In item number 4, it was found that 90% of deaf students used assistive technology in the lecture process. Item number 5 showed 76.1% of students used instant transcription as the most widely used form of assistive technology. Meanwhile, in item number 6, 33.3% of students stated that they always use instant transcription. In item number 7, 90% of deaf students thought that assistive technology helped them in achieving academic performance. However, in item number 8, 76% of students admitted that they still experienced obstacles in using assistive technology. Item number 9 revealed that 76.1% of students mentioned the obstacle that often occurs is the sound that does not enter / is not clear. Finally, in item number 10, 66.7% of deaf students overcame the obstacle by asking for help from hearing friends. In this study, it is concluded that assistive technology helps deaf students in achieving their achievements.

Keywords: *Deaf students, assistive technology, achievement*

INTRODUCTION

The 1945 Constitution of Indonesia, Article 31, states that “every citizen has the right to education.” This provision affirms that education is a basic right of every individual that cannot be limited by social or economic background, physical abilities, or other special conditions. This means that every citizen has the same right to education, including those with special needs. In this context, inclusive education is a highly relevant issue. According to Ahmadi and Supriyono (in Syafi'i, et al. 2018), inclusive education is a form of equalization and the realization of education without discrimination, where students with special needs can receive an equal education in regular classes alongside other students without special needs.

According to Permenristekdikti No. 46 of 2017, students with special needs are students who have physical, intellectual, mental, sensory limitations, and/or who have above-average intelligence potential. Thus, universities are obliged to provide appropriate educational services, including through inclusive classes. An inclusive classroom is a classroom where students with special needs and regular/non-special needs students learn together in an atmosphere of mutual respect and support.

Students with special needs (MBK), especially deaf students, face various challenges and have their own unique characteristics in the process of achieving academic success. Limitations in hearing result in communication barriers that can lead to difficulties in understanding lecture material, limitations in actively participating in class discussions, and difficulties in interacting with lecturers and collaborating with classmates. In addition, access to information conveyed verbally, both by lecturers and through audio media, is also a challenge in itself. The challenges faced by deaf students can affect their academic achievement. The achievement of deaf students is often lower than that of other students. This is mainly due to difficulties in understanding material delivered verbally. However, for courses that do not require verbal communication, deaf students can show progress comparable to that of normal students.

In an effort to overcome these obstacles, the use of assistive technology has developed into an important solution in supporting the academic success of deaf students. Assistive technologies such as speech-to-text can help facilitate communication and understanding of lecture material. However, the application of assistive technology at UNS for deaf students is not yet fully equitable, and there are still obstacles to its use. Daroni (2018) and Rosita, et al. (2020) explained in their research findings that assistive technology can help overcome difficulties in achieving academic achievement for deaf students. Based on this, this study was conducted to find out further to what extent the use of assistive technology can help deaf students at FKIP UNS in achieving their academic achievements.

METHOD

This study uses quantitative descriptive research, which is a method that explains or describes a situation or phenomenon using numbers, starting from data collection, interpretation of the data, and presentation and results (Arikunto, 2019). This method focuses on the collection and analysis of numerical data to understand the characteristics, opinions, or behavior of respondents systematically and objectively. In this approach, the data obtained is processed in numerical form so that the results can be explained statistically. The population in this study consisted of 21 deaf students at FKP UNS. This population was selected using saturated sampling technique, non-purposive sampling, which allowed all members of the population to be selected as samples.

Data collection was carried out using a closed-ended questionnaire. This type of questionnaire was used because it provided predetermined answer choices, thereby

facilitating the data analysis process. Respondents were asked to answer 10 questions by choosing the answer that best suited their personal experiences. This questionnaire was designed to reveal the perceptions and experiences of deaf students regarding the use of assistive technology in supporting their academic achievement.

To ensure that the instruments used in this study were valid, content validity testing was conducted. Content validity refers to the extent to which the items in the instrument reflect all aspects to be measured. In this study, content validity was tested using Aiken's V formula, which is a statistical method for assessing expert agreement on the relevance of items in the instrument. The questionnaire instrument had previously been assessed by several experts in the field of special education and assistive technology to ensure that each question was truly in line with the research objectives.

RESULTS AND DISCUSSION

a. Difficulties in achieving success

Table 1. Analysis of Questionnaire Number 1 Results

Num	Answer	N	%	Mean	Modus
1	Yes	15	71	10,5	Yes
2	No	6	29		
	Total	**21**	**100**		

Based on the questionnaire results, it was found that 71% or 15 deaf students faced difficulties in achieving academic success during their studies. These obstacles contributed to their low academic achievement. This finding is in line with the research by Nari, et al. (2023), which states that deaf students tend to have lower achievements due to limitations in maximizing their intellectual potential and difficulties in understanding material delivered verbally. Meanwhile, 29% or 6 students reported that they did not experience difficulties in achieving academic success during their studies. The most common answer in this questionnaire was “Yes,” chosen by 15 students, indicating that the majority of deaf students do experience obstacles in achieving academic success.

b. Problems encountered

Table 2. Analysis of Questionnaire Number 2 Results

	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6
N1	11	3	8	4	7	2
Nt	21	21	21	21	21	21
%	*52,4*	*14,3*	*38,1*	*19,1*	*33,3*	*9,5*

Based on the table, it is known that the mode of data is found in item 1, namely difficulty in understanding explanations from lecturers. This problem is the most frequently experienced by deaf students, with 11 respondents or 52.4% of the total participants. This finding is in line with the results of research by Mirnawati and Yowono (2020), which revealed that in the lecture process, deaf students often experience obstacles in understanding the material delivered verbally by lecturers. Meanwhile, 2 students or 9.5% stated that they did not experience any obstacles while attending lectures.

c. How to solve problems

Table 3. Analysis of Questionnaire Number 3 Results

	Item 1	**Item 2**	**Item 3**	**Item 4**	**Item 5**
N1	5	15	6	1	9
Nt	21	21	21	21	21
%	*23,8*	*71,4*	*28,6*	*4,7*	*42,9*

The questionnaire results show that the strategy most often used by deaf students in overcoming problems during lectures is asking for help from hearing friends (Item 2), with a percentage of 71.4%. This finding is in line with research conducted by Mirnawati et al. (2020), which states that deaf students feel greatly assisted by the presence of hearing friends, both in taking notes, translating verbal communication, and providing additional explanations outside the classroom. The next strategy that is also quite widely used is utilizing assistive technology (Item 5), with a percentage of 42.9% or equivalent to 9 respondents. Although there are various alternative solutions, there are still a small number of students, namely 4.7% or 1 person, who choose not to take any action or just remain silent when facing obstacles (Item 4).

d. Use of assistive technology during lectures

Table 4. Analysis of Questionnaire Number 4 Results

Num	**Answer**	**N**	**%**	**Mean**	**Modus**
1	Yes	19	90	10,5	Yes
2	No	2	10		
	Total	**21**	**100**		

From the results of the questionnaire given to 21 respondents, it was found that 90% or 19 deaf students used assistive technology in their learning process. The most common answer to this question was “Yes,” indicating that the majority of deaf students had used assistive technology during their lectures. This finding is in line with the research by Pretorius and Van Biljon (2018), which states that most deaf students in higher education utilize assistive technology as support in their academic activities. The use of assistive technology by deaf students is also in line with Daroni's (2018) view, which emphasizes that in the context of inclusive classroom learning, the existence of assistive technology is very necessary, especially when there are deaf students. This technology serves to help lecturers deliver material more effectively, so that the learning process in inclusive classrooms can run optimally.

e. Assistive technologies used

Table 5. Analysis of Questionnaire Number 5 Results

	Item 1	**Item 2**	**Item 3**	**Item 4**	**Item 5**
N1	0	16	6	1	1
Nt	21	21	21	21	21
%	*0*	*76,1*	*28,8*	*4,7*	*4,7*

Various types of speech-to-text assistive technologies are used by deaf students, such as Instant Transcription, SpeechNotes, Speechtexter, and other applications. Of these options, Instant Transcription is the most widely used technology, with 16 students as users, or 76.1% (Item 2). Meanwhile, the least used technology is Speechtexter (Item 4), which is only used by 1 student or 4.7%. In addition, there are also students who choose other alternatives, such as using Speechtexter in combination with clip-on assistive devices.

f. Frequency of using assistive technology

Table 6. Analysis of Questionnaire Number 6 Results

	Item 1	**Item 2**	**Item 3**	**Item 4**
N1	*7*	7	9	0
Nt	21	21	21	21
%	*33,3*	*33,3*	*42,9*	*0*

Deaf students showed variation in the frequency of using speech-to-text assistive technology. In item 1, 33.3% or 7 students stated that they always used this technology. The same number was also recorded in item 2, where 33.3% of students admitted to using it frequently. Meanwhile, in item 3, 42.9% of students said that they only occasionally or rarely use this technology. These findings are in line with the research by Oscirendi et al. (2024), which revealed that deaf students use speech-to-text technology such as Google Voice in their learning activities, with varying intensities, ranging from infrequent to regular use.

g. Assistive technology helps in achieving success

Table 7. Analysis of Questionnaire Number 7 Results

Num	**Answer**	**N**	**%**	**Mean**	**Modus**
1	Yes	19	90	10,5	Yes
2	No	2	10		
	Total	**21**	**100**		

Regarding the question of whether assistive technology contributes to academic achievement, 90% or 19 deaf students answered “Yes.” This shows that the majority feel helped by the existence of this technology in their learning process. This finding is in line with Rosita's (2020) opinion, which states that various types of assistive technology are designed to support deaf students in completing assignments and participating in class discussions. This support indirectly has a positive impact on improving the academic achievement of deaf students.Mengalami masalah saat menggunakan teknologi asistif

Table 8. Analysis of Questionnaire Number 8 Results

Num	**Answer**	**N**	**%**	**Mean**	**Modus**
1	Yes	16	76		
2	No	5	34	10,5	Yes
	Total	**21**	**100**		

The questionnaire results show that 76% or 16 deaf students answered “Yes” when asked if they experienced difficulties in using assistive technology. These findings indicate that although assistive technology plays a role in supporting academic achievement, there are still barriers to its implementation. This statement is in line with Yuwono's (2022) opinion, which states that assistive technology has a number of limitations that can make it difficult for deaf students, especially in understanding transcribed texts.

h. Problems encountered

Table 9. Analysis of Questionnaire Number 9 Results

	Item 1	**Item 2**	**Item 3**	**Item 4**	**Item 5**	**Item 6**
N1	16	3	10	5	1	4
Nt	21	21	21	21	21	21
%	*76,1*	*14,3*	*47,6*	*23,8*	*4,7*	*19,1*

Various factors can cause problems in the use of assistive technology. The most common obstacle experienced by deaf students is undetectable or unclear sound (Item 1), with 16 respondents or 76.1%. Errors in transcription are generally caused by differences in accent and intonation, which result in inaccurate text and interfere with comprehension. Therefore, the voice used in text-to-speech (TTS) technology must be clear, natural, and easy to understand (Botika, 2023). Meanwhile, the least common problem was the inability to operate the device or application (Item 5), which was only experienced by 1 student or 4.7% of the total respondents.

i. How to solve problems

Table 10. Analysis of Questionnaire Number 10 Results

	Item 1	**Item 2**	**Item 3**	**Item 4**	**Item 5**
N1	14	9	8	9	2
Nt	21	21	21	21	21
%	*66,7*	*42,9*	*38,1*	*42,9*	*9,5*

In facing various obstacles when using assistive technology, deaf students have several problem-solving strategies. The most common method is to ask for help from hearing friends (Item 1), which was chosen by 66.7% of respondents or 14 students. This finding is reinforced by Handayani et al. (2023), who state that support from volunteers, such as hearing friends, is still very much needed because deaf students often experience technical difficulties in operating assistive technology. Another strategy that is also widely used is asking for help from fellow deaf friends (Item 2) or companions or volunteers (Item 4), each chosen by 42.9% or 9 students. Although there are various alternative solutions available, there are still a small number of students, namely 9.5% or 2 people, who choose not to take any action when faced with problems.

CONCLUSION

This study shows that the use of assistive technology plays an important role in supporting the academic achievement of deaf students at FKIP UNS. Deaf students still face obstacles, especially in understanding verbal explanations from lecturers, but most are able to overcome these obstacles with adaptive strategies, such as asking for help from hearing friends and utilizing assistive technology. Automatic transcription applications such as Transkripsi Instan have been proven to help students follow lecture material in real-time, improving their understanding and quality of learning.

Most respondents stated that assistive technology helped them understand the material and improve their academic achievement. However, the use of this technology is still constrained by technical factors, accessibility, and operational skills. These findings emphasize the importance of an inclusive and disability-friendly campus environment.

The limitations of this study lie in the limited number of respondents and the use of questionnaires as the sole data collection instrument. Therefore, further research with a broader scope and diverse methods is needed to obtain a more comprehensive picture of the effectiveness of assistive technology in higher education.

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