Insights from the Silent: Exploring Deaf Individuals' Perspectives on Using Learning Management Systems for Online Learning

Jati Suryanto
Universitas Muhammadiyah Yogyakarta, Indonesia
jatisuryanto@umy.ac.id

Puteri Nabilah Ramadhani
Universitas Muhammadiyah Yogyakarta, Indonesia
puteri.nabilah.fpb20@mail.umy.ac.id

Juang Kurniawan Syahruzah
Universitas PGRI, Yogyakarta, Indonesia
juang@upy.ac.id

Maryam Sorohiti
Universitas Muhammadiyah Yogyakarta, Indonesia
maryamsorohiti@umy.ac.id

Article History
Received: 2024-08-09
Reviewed: 2024-08-26
Accepted: 2024-09-17
Published: 2024-09-24

Highlights
The study found that students with hearing impairments face significant challenges in using Learning Management Systems (LMS) for online learning, including technical difficulties, lack of support, and inadequate training, but they employ strategies such as self-study, seeking help, and using additional tools to overcome these barriers.

ABSTRACT: The COVID-19 pandemic has led to a surge in the popularity of online learning, offering students greater flexibility and accessibility. However, students with hearing impairments encounter significant challenges in accessing learning materials and communicating with teachers and peers. This study aims to investigate the experiences of students with hearing impairments using a Learning Management System (LMS) for online learning focusing on their challenges they face and the strategies they employ in their learning. The research was conducted using a descriptive qualitative design at private universities in Yogyakarta. Semi-structured interviews were conducted to gather the data involving three students with hearing impairments who have used LMS in online learning as the participants. The findings revealed the challenges that included the use of multiple applications, lack of understanding on the LMS, lack of LMS notifications, material mismatch, unstable internet connection, tool constraints, lack of inadequate facilities, and there is no training on the use of the LMS. Additionally, the strategies used by the students included self-study, assignment submission via email, asking others for help, using additional apps, using a typist facility, and joining WhatsApp group discussions.

Keywords: Online learning, Learning Management System, Hearing Impairment

Introduction

Online learning has become increasingly popular in recent years, especially due to the COVID-19 pandemic. This pandemic led to the implementation of various policies to avoid the spread of the covid-19 virus (Siahaan, 2020). Teachers and students are encouraged to adopt online learning, using digital technology in the teaching and learning process. Online learning takes place remotely, without face-to-face meetings between teachers and students. Online learning

offers many advantages, such as flexibility, accessibility, and affordability. The benefits include the ability to access the materials at home, at any time, without time and space restrictions (Handayani, 2020). Students also may independently control their learning and learning materials, as well as their time management while they study online (Marbun, 2021).

Online learning is beneficial for many students, but it can also pose challenges for students with special needs such as hearing impairment. They may face challenges in accessing and using learning materials. Students with hearing impairment have significant difficulty hearing sounds clearly or cannot hear them at all. For example, hearing impaired students can only see the motion in the video without being able to hear (Muallifah, 2021).Their inability to hear well might affect how they interact with teachers and other students as well as how well they understand the material they are studying (Utami et al., 2024). Therefore, online learning can be more challenging for hearing impaired students as they may struggle to understand learning materials that are delivered verbally, such as in audio and video.

Learning Management System (LMS) is a widely used tool to support online learning. LMS provides various features that can help teachers to develop and deliver learning materials, as well as provide assignments and assessments to students. An LMS offers a number of capabilities, including, among others, course material management, learning process management, online testing and assessment, course administration, chat, and discussion (Dhianti, 2021). However, the demands of students with special needs in higher education have not been adequately met by the deployment of the Learning Management System during the COVID-19 pandemic (Dewi et al., 2020). Therefore, a further study on the use of LMS for students with special needs need to be conducted.

Karovska (2021) conducted a comprehensive study that explored the perceptions of students with disabilities regarding the use and accessibility of learning management systems and the benefits and/or barriers of using an LMS. Through a qualitative approach with semi-structured interviews, the research identified barriers faced by these students, including the lack of full accessibility to all content and services for students with disabilities. In addition, the research also found an appropriate solution to the challenges faced with a sign language support mode for hearing-impaired students. Another study conducted by Dapa (2022) pointed out the use of assistive technology for online learning for students with special needs. Using the development method, the results found that the difficulties for students with special needs dealt with the network connections, internet costs, and facilities to access information as common obstacles faced by them. In the meantime, the special obstacle is assistive technology that suits their learning needs.

Previous studies have explored the experiences of students with disabilities in online learning environments, offering valuable insights into their challenges and the solutions they have found. For example, Karovska (2021) examined the perceptions of students with disabilities regarding the accessibility and usability of LMS platforms, identifying barriers such as the lack of full accessibility to content and services. The study also suggested solutions, including the implementation of sign language support for hearing-impaired students. Dapa (2022) focused on assistive technology in online learning and identified common obstacles such as network connectivity, high internet costs, and inadequate access to necessary learning facilities for students with special needs. However, these studies primarily concentrate on the experiential aspects of accessibility and communication, rather than the technical limitations of LMS platforms for hearing-impaired students.

The existing research leaves a notable gap in understanding the specific technical functionalities of LMS that may hinder students with hearing impairments. While some studies address general accessibility issues, they do not delve into how LMS platforms themselves could be optimized to better serve this group of learners. For instance, common barriers like the absence of captions for audio and video content, lack of accessible navigation, and failure to integrate assistive technologies remain unaddressed. Therefore, there is a pressing need for research that explores the technical aspects of LMS accessibility for students with hearing impairments to inform the development of more inclusive educational technologies.

Furthermore, hearing-impaired students often face difficulties in communicating with instructors and peers during synchronous online interactions, such as live lectures or group discussions. These events are typically audio-dependent, and the lack of real-time captioning or sign language interpretation can exclude hearing-impaired students from fully participating. This exclusion not only hampers their engagement with the course but also leads to feelings of isolation and disconnection from the learning community.

In summary, while online learning offers many opportunities, it also presents significant challenges for hearing-impaired students, particularly in accessing and engaging with LMS platforms. Addressing these challenges is crucial for fostering more inclusive online learning environments. This study aims to fill the gap by investigating the technical barriers hearing-impaired students face when using LMS platforms and exploring strategies they employ to overcome these obstacles. Specifically, this research will answer two key questions: "What challenges do students with hearing impairments encounter when learning using LMS?" and "What strategies do students with hearing impairments employ in their online learning?" Addressing these questions will provide insights that can guide the development of more accessible and inclusive online learning platforms, ultimately improving the educational experiences of hearing-impaired students.

Understanding Learning Management System for Individuals with Disabilities

The majority of course-related activities now utilise a Learning Management System (LMS) as the main platform for knowledge delivery. However, accessibility is crucial for students with disabilities who may face difficulties utilising and integrating with the online learning environment. LMS platforms serve as essential pedagogical tools for people with disabilities, providing an educational resource that is more easily accessible (Prestianta et al., 2021). Understanding the needs and challenges that individuals with disabilities face when using and accessing an LMS is known as understanding LMS for people with disabilities. It is crucial to have this understanding to ensure that everyone, including those with disabilities, can access and use an LMS. The challenges in making an LMS system accessible to students with disabilities often relate to the specificities associated with each type of condition (Brito & Dias, 2020). Customizing an LMS for individuals with disabilities can help ensure they can access learning resources more easily and conveniently.

The Definition of Disabilities

A disability is a physical or mental condition that makes it more challenging for the affected individual to engage in certain activities and interact with their environment. Disability can arise from various circumstances, including physical, mental, or intellectual disorders.

Individuals with disabilities may have limitations that require assistance from others and may experience differences or disabilities due to physical limitations (Kurniadi, 2020). There are three types of disabilities: physical or functional impairments, activity barriers such as being unable to read or move, and participation barriers such as being unable to attend school or work (WHO, 2018). The degree and treatment of disabilities vary, and categories include mental, physical, motor, learning, speech, behavioral, emotional, autism, double and multiple disabilities, visual, hearing, and other special care needs (Helwig et al., 2019).

A person's life can be significantly impacted by a disability. People with disabilities may find it difficult to access public services, work opportunities, and education. They might also experience prejudice and stigma from the community. However, a disability does not always prevent individuals from achieving their goals or making substantial contributions to society. Support, awareness, accessibility, and an inclusive environment can help people with disabilities overcome obstacles and fully engage in various everyday activities.

The Definition of Hearing Impairment

Hearing impairment is a condition in which a person experiences partial or complete hearing loss. For those who experience hearing loss from birth or after birth, the condition can prevent them from perceiving spoken language, making it difficult to develop speech even if they do not have a voice disorder (Widyastuti & Widiana, 2020). As a result, individuals with hearing impairments face numerous challenges in their development, particularly in language acquisition and social adaptability (Kumala et al., 2022). In terms of communication, the primary issue for hearing-impaired individuals is their ability to understand language, specifically the symbols and structure of language (Anditiasari, 2020). Hearing-impaired individuals often use sign language to communicate. While the finger alphabet has been standardized internationally, sign language varies from one country to another (Rahmah, 2018). Hearing-impaired students typically have limitations in speaking and hearing, making visual media the most suitable learning medium for them (Cahyono, 2019).

The Definition of Learning Management System

Learning Management System (LMS) provides teachers and students with an online classroom environment that supports the learning process. In this environment, LMS facilitates the learning experience for both teachers and students (Bradley, 2020). LMS is a widely used e-learning tool that enhances students' learning experiences and help them construct their understanding of various topics (Kasim & Khalid, 2016). The functions of an LMS range from essential services, such as providing educational content, to tracking users' progress throughout a course and conducting regular assessments (Naz & Khan, 2018). LMS is a software platform designed for creating, distributing, and organizing online courses, distributing course materials, and facilitating participation by students and teachers. The platforms of LMS assist teachers in creating lesson plans, managing learning resources, supervising student activities, and delivering assessments for specific learning processes.

LMS can be used to administer, organize, and distribute various learning resources in an online or hybrid (online and in-person) format. Businesses, organizations, and educational institutions use LMS to effectively track, distribute, and manage learning resources. Teachers can create and distribute educational materials, assign homework, and monitor students' progress in real time with an LMS. Additionally, LMS provides a virtual environment for students and teachers to communicate, collaborate, and share information. The tracking and

reporting capabilities of LMS allow for close monitoring of individual or group progress, helping identify areas for improvement. LMS has made learning more flexible, affordable, and accessible from any location, thereby enhancing the global accessibility of education.

The Challenges in Using Learning Management System

There are several challenges that may arise when implementing a learning management system (LMS). Among the challenges that hearing-impaired students face when using LMS are inadequate equipment and software, insufficient infrastructure, low internet access, and inadequate training for teachers and students (Al-Hunaiyyan et al., 2020). In addition to experiencing problems with internet networks and data quotas, students with hearing impairments also struggle to participate fully in lectures. They may have difficulty utilizing educational resources used in lectures, such as Zoom and SIMARI (Yuwono et al., 2022). Some e-learning components remain difficult for people with hearing impairments to use. Other issues include the inability to access knowledge bases instantly, the flexibility and convenience of learning requirements, the difficulty of determining learning needs, and the high cost of setting up and maintaining an LMS (Ali et al., 2022). All users, including people with disabilities, should be able to access the LMS.

The Strategies in Using Learning Management System

Individuals with disabilities, such as those with hearing impairments, can use an LMS to learn through various techniques and resources. An LMS can provide alternative text for multimedia materials, such as audio, graphics, and video, which is beneficial for individuals with hearing loss (Fauzan et al., 2023). Visual design is crucial in the learning process for students with hearing impairments. Providing audio/video resources with text or sign language transcription or translation can enhance understanding for students who are hard of hearing. Sign language can serve as a bridge for communication (Rahmi, 2023). Employing a specialized platform can enable the LMS to offer specific accessibility features, such as simplified navigation or other assistive tools. Specialized training and support can help hearing-impaired students use software or assistive technology tools that enhance their accessibility within the LMS.

The Disable-Friendly Learning Management System

A disability-friendly learning management system (LMS) is designed to be used and accessed by all users, including those with disabilities. Such a platform includes accessibility features that make learning materials easy and efficient for individuals with impairments. It should provide students with disabilities access to educational resources, including instructional materials, learning media, and tools that instructors can use in lectures attended by these students (Sunardi et al., 2021). To ensure usability for all users, including those with disabilities, the LMS should comply with accessibility guidelines.

To facilitate accessibility for various types of disabilities, the platform should offer content in multiple formats (text, audio, video, and images) along with alternative text. It should encourage inclusive communication through email, chat, discussion forums, and other platforms to ensure that students with disabilities can fully participate. Additionally, learning materials should be well-organized, and instructions should be clear to help students with disabilities understand them, including reviews of related studies and conceptual frameworks.

Methodology

This study employed a qualitative research design to explore the challenges and strategies faced by students with hearing impairments when using a Learning Management System (LMS) for academic purposes. A qualitative approach was chosen because it provides a deeper, more comprehensive understanding of the participants' lived experiences, which is essential when investigating complex, personal, and context-specific issues such as accessibility in online learning environments (Ugwu et al., 2017). Qualitative research allows participants to express their perspectives in their own words, offering rich, detailed descriptions of their unique challenges and the strategies they employ to navigate the LMS. This approach is particularly suitable for this study, as it focuses on capturing the personal and social dimensions of their interactions with the technology.

A descriptive qualitative design was specifically employed because it is effective in identifying and explaining specific elements of participants' experiences (Junlapeeya et al., 2023). This method enabled the researchers to explore the nuanced ways in which hearing-impaired students engage with LMS platforms, as well as the specific obstacles they face and the strategies they use to overcome these obstacles. Through this approach, the study aims to provide a holistic picture of the students' experiences, shedding light on the broader implications of LMS use for students with disabilities.

The study focused on university students with hearing impairments from several private universities in Yogyakarta, Indonesia. The selection of participants was guided by purposive sampling, a method used to identify individuals who are most suited to provide relevant information for the research objectives (Santina et al., 2021). Purposive sampling is ideal for this study because it allows for the selection of participants who meet specific criteria that are central to answering the research questions.

The following criteria were established for selecting participants:

1. Hearing Impairment: The participants must be deaf or have significant hearing loss. This criterion ensures that the participants have direct experience with the specific challenges faced by hearing-impaired students in online learning environments.
2. University Students: The participants must be currently enrolled at a university in Indonesia, ensuring that they have relevant academic experience in using LMS as part of their learning process.
3. LMS Usage: The participants must have experience using an LMS in their courses. This criterion ensures that participants have practical knowledge of the specific tools and challenges associated with LMS platforms, allowing the researchers to gather relevant data on accessibility issues.

These criteria allowed the researchers to focus on students who have firsthand experience with both hearing impairments and the use of LMS, providing detailed and specific insights into the research questions. To protect the participants' privacy, pseudonyms were used, and their identities were kept confidential throughout the study (Wang et al., 2024). This not only helped maintain ethical research practices but also encouraged participants to share openly and honestly about their experiences, which is crucial for obtaining accurate and meaningful data.

Semi-structured interviews were employed as the primary data collection method. This approach combines both closed and open-ended questions, allowing researchers to guide the conversation while also giving participants the flexibility to elaborate on their experiences (Ruslin et al., 2022). Semi-structured interviews were particularly useful for this study because they provided the structure needed to focus on specific challenges and strategies related to LMS use while allowing participants to share rich, detailed accounts of their experiences in their own words.

The use of open-ended questions in these interviews facilitated a deeper exploration of the participants' personal perspectives on the difficulties they face and the solutions they have developed, helping to uncover insights that may not have emerged through more rigid question formats (Monday, 2020). Through this method, the study aimed to generate a comprehensive understanding of the accessibility issues faced by hearing-impaired students and to identify potential strategies for improving LMS platforms to better support students with disabilities.

Results and Discussion

The Challenges Encountered by Students with Hearing Impairments When Learning Using LMS

This section addresses the first research question: the challenges faced by students with hearing impairments when using Learning Management Systems (LMS) for academic purposes. The data analysis from semi-structured interviews provided a clear understanding of the specific difficulties encountered by the participants, allowing for a nuanced discussion based on their personal experiences. The findings are based on the participants' responses, avoiding overgeneralization while highlighting the central themes that emerged.

Using Multiple Apps in Online Learning

One challenge identified was the need to use multiple applications for online learning. Students mentioned that in addition to the LMS, they had to switch between platforms like Zoom, Google Meet, and other apps for synchronous sessions or additional assignments. Andy expressed, "Usually lecturers ask us to go online via Zoom or through assignments given on the LMS." Similarly, Ben and Charlie also mentioned the frequent use of different applications.

This challenge is specific to the students' experiences and may vary depending on the structure of online learning at different institutions. While Mustika (2021) observed that students with hearing impairments tend to rely more on visual learning, the findings here emphasize that juggling multiple apps, especially those without real-time text translation, can create additional hurdles. However, this observation does not suggest that all LMS platforms or apps present such issues; the focus is on the challenges faced by students within the context of this study.

Lack of Understanding About the LMS

Participants expressed difficulties in understanding how to use the LMS effectively, especially at the beginning of their online learning journey. Andy admitted, "I actually don't know what LMS is," and both Ben and Charlie described confusion with the system, leading to initial academic struggles.

These findings align with Widiyono's (2021) study, which highlighted that many students and teachers lack the skills needed to utilize LMS-based systems effectively. It is important to note that these challenges stem from the participants' limited exposure to LMS rather than a flaw in the system itself. Hence, the results are specific to the students' personal experiences and do not suggest a general inefficacy of LMS platforms.

Lack of Notifications from LMS

A common concern among participants was the lack of clear notifications from the LMS about assignments and deadlines. Andy noted, "There is still a lack of notification," while Ben and Charlie expressed similar sentiments.

These insights reflect the participants' need for a more robust notification system within the LMS to help them manage their coursework. While Akib and Uluelang (2019) stressed the importance of LMS notifications for keeping students informed, this study highlights how a deficiency in this feature can particularly affect hearing-impaired students, who rely on visual cues. However, this issue may vary between LMS platforms and should not be generalized beyond the scope of this research.

Material Mismatch

Participants reported a mismatch between the material presented by lecturers and the learning modules or assignments available on the LMS. Andy pointed out, "The problem arises when the material in the PPT provided by the lecturer doesn't align with the assignments."

This issue was unique to the specific experiences of these students and does not imply that all students or lecturers face similar challenges. It is essential to recognize that the misalignment of materials could be a result of individual instructor practices rather than a systemic issue with LMS. Alimudin (2015) also noted that communication breakdowns can occur when there is a disconnect between course materials and assignments, which echoes the participants' experiences in this study.

Technical Constraints

All participants mentioned technical challenges, such as system lag or poor internet connectivity, which disrupted their use of the LMS. Andy shared that the LMS would load slowly, often leaving him with limited time to complete assignments.

These challenges are consistent with Fakhruddin et al. (2022), who found that students frequently encounter issues related to network instability and overloaded LMS servers. However, these technical constraints are context-dependent and not indicative of all students' experiences with online learning systems.

Tool Constraints

Andy also mentioned difficulty accessing certain tools or applications needed for learning, such as paid apps that were required to complete assignments. This challenge underscores the financial and technical limitations some students face, especially those with disabilities who may require additional resources. Sauri (2020) observed that paid applications often create barriers for students, which aligns with the experiences reported in this study.

Nonetheless, this finding is based on the specific circumstances of these participants and does not suggest that all students face similar tool-related challenges.

Lack of Specialized Facilities

Participants highlighted the need for specialized support, such as sign language interpreters and subtitled videos. Charlie mentioned, "There should be features to convert images or videos into text because I rely on text to understand."

This challenge aligns with existing literature, such as Mandasari (2020), which emphasizes the importance of inclusive learning environments for students with hearing impairments. However, it is essential to note that the availability of such facilities varies by institution, and these findings reflect the circumstances of the universities in this study.

No Training on the Use of LMS

Finally, participants reported that they received no formal training on how to use the LMS. Andy remarked, "There is no training for using the LMS from the campus or lecturers." This finding is supported by Marzal (2019), who also found that a lack of training can significantly hinder students' ability to use digital tools effectively. The absence of training was a challenge unique to the participants in this study, and it is not necessarily reflective of other institutions or students' experiences.

Conclusion

This study identified self-perceptions of students with hearing loss regarding their challenges, namely using multiple applications in online learning, lack of understanding of the LMS, lack of notifications, material mismatch, technical constraints, tool constraints, lack of special facilities, and no training for the use of the LMS provided by the campus or lecturers. For the second question, the researchers found the strategies used by students with hearing impairments during learning with the LMS which included self-learning to understand the LMS, collecting assignments via email, asking others for help, using additional applications, utilizing typist facilities, and participating in discussions in WhatsApp groups.

From these findings, it can be concluded that students with hearing loss face numerous challenges in online learning using LMS. However, they have also demonstrated the ability to adapt and develop various strategies to overcome these challenges. With better support from campuses and lecturers, as well as improved accessibility of the LMS, it is hoped that online learning for deaf students can become more effective and inclusive.

Recommendations

The researchers have several recommendations for various stakeholders related to this study, including educators in schools and other researchers. Based on the research results, students with hearing loss can utilize technological advancements as learning aids, which can enhance communication and social interaction. Lecturers should consider the needs of all students, including those with special needs, when explaining material and providing assignments. Clear instructions and accessible materials can motivate students and enhance their learning experience. The researchers also suggest that instructional designers and developers create

LMS features tailored to students with disabilities, such as voice-to-text, high contrast, subtitles, and clear assignment notifications with deadlines.

References

Akbar, R., Wijiastuti, A., & Yuliati. (2023). Pengembangan Media Pembelajaran Matematika…. Pengembangan Media Pembelajaran Matematika Materi Pecahan dengan Pendekatan Multi Representasi Berbasis Web Bagi Pesrta Didik Smplb Tunarungu. *Grab Kids: Journal of Special Education Need*, *3*(1), 16–30.

Al-Hunaiyyan, A., Al-Sharhan, S., & AlHajri, R. (2020). Prospects and Challenges of Learning Management Systems in Higher Education. *International Journal of Advanced Computer Science and Applications*, *11*(12), 73–79. https://doi.org/10.14569/IJACSA.2020.0111209

Ali, S. S., Helmy, P. Y. M., & Moawad, P. I. F. (2022). Challenges of Learning Management Systems and Current Trends. *International Journal of Advanced Engineering, Management and Science*, *8*(9), 15–24. https://doi.org/10.22161/ijaems.89.3

Alshawabkeh, A. A., Woolsey, M. L., & Kharbat, F. F. (2021). Using online information technology for deaf students during COVID-19: A closer look from experience. *Heliyon*, *7*(5), e06915. https://doi.org/10.1016/j.heliyon.2021.e06915

Anditiasari, N. (2020). Analisis Kesulitan Belajar Abk (Tuna Rungu) Dalam Menyelesaikan Soal Cerita Matematika. *Mathline : Jurnal Matematika Dan Pendidikan Matematika*, *5*(2), 183–194. https://doi.org/10.31943/mathline.v5i2.162

Angelia Widyastuti, P., & Widiana, I. W. (2020). Analisis Peran Tutor Sebaya Terhadap Sikap Sosial Siswa Tuna Rungu. *Journal of Education Technology*, *4*(1), 46. https://doi.org/10.23887/jet.v4i1.24083

Bradley, V. M. (2020). Learning Management System (LMS) Use with Online Instruction. *International Journal of Technology in Education*, *4*(1), 68. https://doi.org/10.46328/ijte.36

Brito, E., & Dias, G. P. (2020). LMS accessibility for students with disabilities: The experts' opinions. *Iberian Conference on Information Systems and Technologies, CISTI*, *2020-June*(May). https://doi.org/10.23919/CISTI49556.2020.9141046

Cahyono, G. (2019). Perencanaan Pembelajaran PAI Berbasis Media Visual Bagi Anak Tuna Rungu. *IQRO: Journal of Islamic Education*, *2*(1), 81–98. https://doi.org/10.24256/iqro.v2i1.850

Cohen, L., Manion, L., & Morrison, K. (2021). *in Education Eighth edition*. 5103697.

Creswell, J. W., & Creswell, J. D. (2018). Mixed Methods Procedures. In *Research Defign: Qualitative, Quantitative, and Mixed M ethods Approaches*.

Dapa, N. A. (2022). Teknologi Asistif Bagi Pembelajaran Online Mahasiswa Berkebutuhan Khusus. *Jurnal Ilmiah Wahana Pendidikan*, *8*(12), 599–605.

Dewi, E. K., Utomo, & Misliyani. (2020). *Faktor-faktor penghambat mahasiswa berkebutuhan khusus dalam menggunakan Learning Management System (LMS)*. *18*(1), 56–69.

Handayani, L. (2020). Keuntungan, kendala, dan solusi pembelajaran online selama pandemi covid-19: studi ekploratif di SMPN 3 Bae Kudus {Advantages, constraints, and solutions for online learning during the covid-19 pandemic: An explorative study at SMPN 3 Bae Kudus}. *Journal Industrial Engineering & Management Research*, *1*(2), 16.

Junlapeeya, P., Lorga, T., Santiprasitkul, S., & Tonkuriman, A. (2023). A Descriptive Qualitative Study of Older Persons and Family Experiences with Extreme Weather Conditions in Northern Thailand. *International Journal of Environmental Research and Public Health*, *20*(12). https://doi.org/10.3390/ijerph20126167

Karovska Ristovska, A., Rashikj-Canevska, O., Tasevska, A., Bruziene, R., Orechova, M., Paiva Dias, G., Brito, E., & Haubro, H. (2021). Accessible Learning Management Systems: Students' Experiences and Insights. *Prizren Social Science Journal*, *5*(2), 1–13. https://doi.org/10.32936/pssj.v5i2.224

Kasim, N. N. M., & Khalid, F. (2016). Choosing the right learning management system (LMS) for the higher education institution context: A systematic review. *International Journal of Emerging Technologies in Learning*, *11*(6), 55–61. https://doi.org/10.3991/ijet.v11i06.5644

Kivunja, C. (2018). Distinguishing between theory, theoretical framework, and conceptual framework: A systematic review of lessons from the field. *International Journal of Higher Education*, *7*(6), 44–53. https://doi.org/10.5430/ijhe.v7n6p44

Kumala, F. N. F., Kamalia, A., & Khotimah, S. K. (2022). Gambaran dukungan sosial keluarga yang memiliki anak tuna rungu. *Personifikasi: Jurnal Ilmu Psikologi*, *13*(1), 1–10. https://doi.org/10.21107/personifikasi.v13i1.13292

Leny Dhianti. (2021). Efektivitas Blended Learning Berbasis LMS dalam Pembelajaran Matematika. *Jurnal Riset Pembelajaran Matematika Sekolah*, *5*(1), 80–84. https://doi.org/10.21009/jrpms.051.10

Marbun, P. (2021). Disain Pembelajaran Online Pada Era Dan Pasca Covid-19. *CSRID (Computer Science Research and Its Development Journal)*, *12*(2), 129. https://doi.org/10.22303/csrid.12.2.2020.129-142

Monday, T. U. (2020). Impacts of Interview as Research Instrument of Data Collection in Social Sciences. *Journal of Digital Art & Humanities*, *1*(1), 15–24. https://doi.org/10.33847/2712-8148.1.1_2

Muallifah, M. (2021). Strategi Pendidikan Inklusif: : Konteks E-Learning pada Mahasiswa Difabel Tuna Rungu dan Tuna Netra. *Tarbawi*, *10*(1), 65–76. https://jurnal.alfithrah.ac.id/index.php/tarbawi/article/view/162

Naz, T., & Khan, M. (2018). Functionality gaps in the design of learning management systems. *International Journal of Advanced Computer Science and Applications*, *9*(11), 371–374. https://doi.org/10.14569/ijacsa.2018.091152

Pappas, M. A., Demertzi, E., Papagerasimou, Y., Koukianakis, L., Kouremenos, D., Loukidis, I., & Drigas, A. S. (2018). E-learning for deaf adults from a user-centered perspective. *Education Sciences*, *8*(4). https://doi.org/10.3390/educsci8040206

Prestianta, A. M., Bangun, C. R. A., Perdana, I. H., & Vivrie, T. L. (2021). Pemanfaatan

Sistem Manajemen Pembelajaran Bagi Guru dan Orang Tua Siswa Disabilitas Netra di SLB A Pembina Tingkat Nasional. *Jurnal Komunikasi Profesional*, *5*(1), 88–102. https://doi.org/10.25139/jkp.v5i1.3552

Rahmah, F. N. (2018). Problematika Anak Tunarungu Dan Cara Mengatasinya. *Quality*, *6*(1), 1. https://doi.org/10.21043/quality.v6i1.5744

Rahmi, R. (2023). Urgensi Ketersediaan Juru Bahasa Isyarat pada Khutbah Jum'at bagi Tuli. *Inklusi*, *9*(2), 213–236. https://doi.org/10.14421/ijds.090205

Ruslin, Mashuri, S., Rasak, M. S. A., Alhabsyi, F., & Syam, H. (2022). Semi-structured Interview: A Methodological Reflection on the Development of a Qualitative Research Instrument in Educational Studies. *IOSR Journal of Research & Method in Education (IOSR-JRME)*, *12*(1), 22–29. https://doi.org/10.9790/7388-1201052229

Santina, R. O., Hayati, F., & Oktariana, R. (2021). Analisis Peran Orangtua Dalam Mengatasi Perilaku Sibling Rivalry Anak Usia Dini. *Jurnal Ilmiah Mahasiswa …*, *2*(1), 1–13. file:///Users/ajc/Downloads/319-File Utama Naskah-423-1-10-20210810.pdf

Siahaan, M. (2020). Dampak Pandemi Covid-19 Terhadap Dunia Pendidikan. *Jurnal Kajian Ilmiah*, *1*(1), 73–80. https://doi.org/10.31599/jki.v1i1.265

Sunardi, Nugroho, R. A., & Budi, H. (2021). *Eye Online Learning Media Design*. 1–8.

Utami, I. S., Budi, S., Arnez, G., & Hafid, A. (2024). Needs Analysis Study of Blended Learning Model to Improve Communication for Students with Hearing Impairment. *Pedagogia : Jurnal Pendidikan*, *13*(2), 216–224. https://doi.org/10.21070/pedagogia.v13i2.1689

Wang, S., Ramdani, J. M., Sun, S., Bose, P., & Gao, X. (2024). Naming Research Participants in Qualitative Language Learning Research: Numbers, Pseudonyms, or Real Names? *Journal of Language, Identity and Education*, *00*(00), 1–14. https://doi.org/10.1080/15348458.2023.2298737

Yuwono, I., Mirnawati, M., Kusumastuti, D. E., & Ramli, T. J. (2022). Challenges of Deaf Students in Online Learning at Universities. *AL-ISHLAH: Jurnal Pendidikan*, *14*(2), 2291–2298. https://doi.org/10.35445/alishlah.v14i2.1328