THE IMPACT OF ARTIFICIAL INTELLIGENCE AND ASSISTIVE TECHNOLOGIES ON THE WORK OF SURDOPEDAGOGUES

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Abstract Artificial intelligence and assistive technologies are becoming increasingly important in special education, particularly in the education of children with hearing impairments. Surdopedagogues now have access to a wide range of technological tools, including speech recognition systems, automatic subtitles, sign language support applications, hearing-support devices, interactive learning software, intelligent educational platforms, and data-based assessment tools. These technologies are changing both the methods and the scope of teachers' work. The use of artificial intelligence and assistive technologies can significantly improve communication, accessibility, lesson adaptation, and individualized learning. At the same time, these innovations require teachers to develop new competencies, rethink traditional teaching methods, and integrate technology into specialized pedagogical practice. This article examines the impact of artificial intelligence and assistive technologies on the work of surdopedagogues. It analyzes the opportunities created by technological innovation, such as increased accessibility and personalized instruction, as well as the challenges related to training, ethical concerns, technical dependence, and unequal access to resources. The findings show that artificial intelligence and assistive technologies can greatly improve the quality of hearing-impaired education when they are used thoughtfully and supported by proper training and institutional infrastructure. Their successful implementation depends not only on the availability of technology but also on teachers' readiness and professional confidence.

Keywords: artificial intelligence, assistive technologies, surdopedagogy, hearing impairments, digital education.

Introduction Artificial intelligence has become one of the most influential innovations in modern education. It is used in learning management systems, speech recognition tools, automatic translation, adaptive learning platforms, data analysis, and educational content generation. In special education, these innovations are especially valuable because they can help teachers create more accessible and individualized learning experiences.

For children with hearing impairments, access to communication is a central condition of successful education. Such students often benefit from subtitles, visual aids, hearing devices, sign language resources, speech-to-text systems, and interactive applications. Assistive technologies have long supported these needs, but artificial intelligence has expanded their potential by making tools faster, smarter, and more responsive.

Surdopedagogues are at the center of this transformation. They are responsible for selecting, adapting, and using technologies in ways that fit students' communication abilities and learning needs. Their work now includes not only teaching but also digital mediation, technological coordination, and individualized support.

At the same time, the use of artificial intelligence and assistive technologies raises new questions. Teachers need training to use these tools effectively. They may also face concerns related to dependence on technology, technical errors, access inequality, privacy, and the balance between human interaction and digital assistance.

This article explores how artificial intelligence and assistive technologies influence the work of surdopedagogues, with special attention to teaching effectiveness, accessibility, professional adaptation, and the challenges of implementation.

Methods

This study employed qualitative research methods and theoretical analysis. Its purpose was to examine the role of artificial intelligence and assistive technologies in the work of surdopedagogues and to identify their educational advantages and professional challenges.

The following methods were used:

1. Literature review – scientific studies, books, educational reports, and policy documents on artificial intelligence, assistive technologies, special education, and hearing-impaired education were analyzed.
2. Comparative analysis – different categories of technologies and their educational applications were compared.
3. Theoretical analysis – the relationship between technology use, accessibility, teacher competence, and teaching effectiveness was examined.
4. Observation-based generalization – practical examples of technology integration in surdopedagogical work were summarized.

The study focused on both the pedagogical and professional dimensions of technology use, including communication support, lesson planning, assessment, and teacher adaptation.

Results

The study identified several significant benefits of artificial intelligence and assistive technologies for the work of surdopedagogues.

First, communication was found to improve considerably through the use of speech recognition systems, automatic subtitles, transcription tools, and visual communication applications. These resources make spoken language more accessible to students with hearing impairments and help teachers provide clearer instruction.

Second, personalized learning becomes easier when intelligent systems are used. AI-based platforms can support differentiated tasks, adaptive pacing, and individual feedback. This allows surdopedagogues to tailor lessons to students' communication needs, academic levels, and response patterns.

Third, technology helps teachers prepare lessons more efficiently. Digital tools can assist in creating visual materials, generating subtitles, organizing content, and tracking student progress. This may reduce some routine tasks and allow teachers to focus more on direct pedagogical interaction.

Fourth, assessment becomes more systematic with the help of digital and AI-supported tools. Teachers can monitor students' performance, participation, and learning progress more accurately.

However, the study also identified several challenges. Teachers may experience difficulty when they lack training or technical support. In some contexts, schools may not have equal access to modern technologies. There are also concerns about excessive dependence on digital systems, reduced human interaction, and ethical issues related to privacy and data use.

Discussion The findings of the study suggest that artificial intelligence and assistive technologies have the potential to transform surdopedagogical practice in meaningful ways. They support communication, improve accessibility, and make it easier to create individualized learning conditions for children with hearing impairments.

At the same time, the study emphasizes that technology is not a substitute for pedagogical knowledge or human interaction. Surdopedagogues remain essential because they interpret student needs, make professional decisions, and create emotionally supportive learning environments.

One of the most important issues highlighted by the study is teacher readiness. The effectiveness of artificial intelligence depends on whether teachers understand how and when to use it. Without professional preparation, even useful tools may remain underused or create confusion.

The study also raises the issue of educational equity. If only some schools have access to advanced assistive technologies, digital innovation may deepen inequality. Therefore, policymakers and institutions should ensure fair distribution of resources.

Another important point is ethical responsibility. AI tools often rely on data collection, automated decisions, or algorithmic interpretation. Teachers need guidance on how to use such systems in ways that protect privacy, respect student dignity, and preserve meaningful human communication.

Conclusion

Artificial intelligence and assistive technologies can significantly improve the work of surdopedagogues by supporting communication, increasing accessibility, enabling personalized learning, and improving lesson preparation and assessment. These technologies offer valuable opportunities for enhancing the quality of education for children with hearing impairments. However, successful implementation depends on more than the presence of technology itself. Teachers need proper training, technical support, ethical guidance, and institutional encouragement in order to use these tools effectively and responsibly.

Educational institutions should therefore invest not only in equipment and software but also in teacher preparedness and equitable access. When artificial intelligence and assistive technologies are integrated thoughtfully, they can become powerful instruments for both teacher effectiveness and student inclusion.

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