

DOI: <https://doi.org/10.34069/AI/2024.78.06.8>

How to Cite:

Savinova, N., Demchenko, I., Kalynovska, I., Vertel, A., & Omelchenko, M. (2024). Equitable learning for all: exploring hurdles and prospects in inclusive pedagogy. *Amazonia Investiga*, 13(78), 95-104. <https://doi.org/10.34069/AI/2024.78.06.8>


Equitable learning for all: exploring hurdles and prospects in inclusive pedagogy

Рівноправне навчання для всіх: дослідження перешкод та перспектив в інклюзивній педагогіці

Received: April 11, 2024

Accepted: June 18, 2024

Written by:


Nataliia Savinova¹ <https://orcid.org/0000-0003-2617-8221>**Iryna Demchenko²** <https://orcid.org/0000-0003-4302-7564>**Iryna Kalynovska³** <https://orcid.org/0000-0001-8805-4641>**Anton Vertel⁴** <https://orcid.org/0009-0007-5258-078X>**Maryna Omelchenko⁵** <https://orcid.org/0000-0001-8292-1791>

Abstract


Inclusive education is a crucial aspect of contemporary educational systems to ensure accessibility and quality of education for all learners, including those with developmental peculiarities or disabilities. This article reviews current research and publications on inclusive education to identify critical trends, challenges, and achievements. Several aspects of inclusive education have been analysed, including teacher training, using technologies, creating an environment, and resolving socio-cultural issues. Based on the findings, conclusions are drawn about the necessity of a comprehensive approach to implementing inclusive education, including the professional training of educators, active use of technologies, and creation of an educational environment. Important directions for further research could include studying the impact of


Анотація


Інклюзивна освіта є важливим аспектом сучасних освітніх систем, що забезпечує доступність та якість освіти для всіх учнів, у тому числі з особливостями розвитку або інвалідністю. У цій статті зроблено огляд сучасних досліджень і публікацій з питань інклюзивної освіти з метою визначення найважливіших тенденцій, викликів і досягнень. Проаналізовано кілька аспектів інклюзивної освіти, включаючи підготовку вчителів, використання технологій, створення середовища та вирішення соціокультурних питань. На основі отриманих результатів зроблено висновки про необхідність комплексного підходу до впровадження інклюзивної освіти, що включає професійну підготовку педагогів, активне використання технологій та створення освітнього

¹ Doctor of Pedagogical Sciences, Professor of the Department of Special Pedagogy and Psychology and Inclusive Education, Faculty of Preschool and Special Education and History, Kharkiv Humanitarian Pedagogical Academy, Kharkiv, Ukraine.  WoS Researcher ID: GLV-2985-2022

² Doctor of Pedagogical Sciences, Professor, Professor of the Department of Social Work and Rehabilitation, National University of Life and Environmental Sciences of Ukraine, Kyiv, Ukraine.  WoS Researcher ID: E-3527-2019

³ PhD in Pedagogical Sciences, Associate Professor, Special and Inclusive Education Department, Faculty of Preschool and Special Education, Pavlo Tychyna Uman State Pedagogical University, Uman, Ukraine.  WoS Researcher ID: E-1318-2019

⁴ PhD, Assistant Professor of the Department of Psychology, Sumy State Pedagogical University named after A.S. Makarenko, Sumy, Ukraine.  WoS Researcher ID: AAE-4576-2019

⁵ Doctor of Psychology, Professor, Department of Special Pedagogy and Inclusion, Faculty of Special Education, Donbas State Pedagogical University, Sloviansk, Ukraine.  WoS Researcher ID: G-2932-2018



professional teacher training on the successful implementation of inclusive education, analysing the effectiveness of various educational methods and strategies, and investigating the role of technologies in ensuring education accessibility for all learners. Integrating the findings from such studies can assist educational institutions and government bodies in developing and implementing more effective strategies and policies for inclusive education. It, in turn, can improve accessibility and quality of education for all children and youth, regardless of their characteristics and needs.

Keywords: adaptive technologies, educational accessibility, educational practice effectiveness, special educational needs, teacher professional training.

Introduction

In recent decades, inclusive education has attracted increasing attention within the global community and the academic environment. This educational approach seeks to ensure equal learning opportunities for all learners, regardless of their characteristics and needs, aiming to create an inclusive educational environment that facilitates the successful development of each individual. In the modern world, where technology is becoming an increasingly integral part of the educational process, interest in using information technology within inclusive education is growing. The works of Beketova & Ogoltsova (2023) and Abosi, Emereole, & Adjepon-Yamoah (2022) highlight crucial considerations regarding integrating intelligent learning systems and information technologies to enhance the efficacy of inclusive education. Moreover, a pivotal aspect of inclusive education is acknowledging socio-cultural factors and creating conditions for inclusive learning for all learners. The works of Bešić (2020) and Boyle & Anderson (2020) offer perspectives on inclusive education through intersectionality and justify the necessity of inclusive learning in the context of specific national educational systems.

Furthermore, scientific research in inclusive education actively explores the impact of gaming technologies and various methodologies on the education and social adaptation of children with special educational needs (Costa et al., 2022). It examines an approach to learning based on using beauty technologies and artefacts. Despite progress in inclusive education, challenges and obstacles that require further research and the development of new strategies remain.

It is crucial to acknowledge the existence of accessibility challenges in education for students with disabilities in specific fields, such as STEM education. The findings of Peña-Becerril et al. (2021) highlight the necessity for developing protocols that guarantee educational accessibility for students with disabilities in science, technology, engineering, and mathematics (STEM). Furthermore, Quapp & Holschemacher (2023) emphasise the importance of special conditions for engineering students with specific requirements. In light of the rapid development of digital technologies, it is also necessary to consider issues of educational accessibility in the context of the digital age. The work of Yanli & Danni (2021) analyses the prospects of vocational education in the digital era and the role of the European Union's Digital Education Action Plan (2021-2027). These issues represent only a tiny subset of the challenges inclusive education faces. Their resolution requires a comprehensive approach that includes technical and pedagogical innovations, changes in the socio-cultural environment, and the training of professionals.

This article aims to study and analyse inclusive education's challenges and propose practical strategies and recommendations for overcoming them. Based on a review of existing literature and analysis of current issues, the article aims to identify critical aspects affecting inclusive education's effectiveness and offer practical solutions to address them.

середовища. Важливими напрямами подальших досліджень можуть бути вивчення впливу професійної підготовки вчителів на успішне впровадження інклюзивної освіти, аналіз ефективності різних освітніх методів і стратегій, дослідження ролі технологій у забезпеченні доступності освіти для всіх учнів. Інтеграція результатів таких досліджень може допомогти навчальним закладам і державним органам у розробці та впровадженні більш ефективних стратегій і політик у сфері інклюзивної освіти. Це, в свою чергу, може покращити доступність та якість освіти для всіх дітей та молоді, незалежно від їхніх особливостей та потреб.

Ключові слова: адаптивні технології, доступність освіти, ефективність освітньої практики, особливі освітні потреби, професійна підготовка вчителів.

Research objectives:

1. To conduct a broad review of existing literature and research on inclusive education to identify the main trends, challenges and achievements in this area.
2. To analyse the problems and challenges inclusive education practices face to gain a deeper understanding of them and identify critical aspects.
3. To develop practical strategies and recommendations for overcoming the identified problems and challenges based on the literature analysis and current trends in inclusive education.
4. To evaluate the effectiveness of different inclusive education practices to identify the most successful approaches and factors contributing to success.
5. To formulate generalised conclusions and recommendations based on the analysis and research to offer practical guidance and recommendations for education professionals.

Recent research and publication analysis

It is possible to analyse the list of references by dividing the sources into several areas reflecting different aspects of research in inclusive education.

1. Methodologies and approaches in inclusive education. Research in this field is focused on developing and substantiating methodologies that promote inclusive education. A. Gervasoni & A. Peter-Koop (2020) discuss methods of inclusive education in mathematics. C. Boyle & J. Anderson (2020) examine the rationale for inclusive education in Australia. The works of S. Lakkala & E. Óskarsdóttir (2021) focus on the sustainability of inclusive education. E. Bešić (2020) considers intersectionality in the context of inclusive education. L. Lübke, M. Pinquart, & M. Schwinger (2021) analyse the importance of flexibility in inclusive education. N. Pandey (2020) discusses various approaches to inclusive education. The authors analyse different pedagogical strategies that can be used to integrate learners with diverse needs into the educational process. Primary attention is paid to the adaptability and flexibility of learning, affirming the importance of an individualised approach to education.
2. Technology in inclusive education. The technological direction investigates the potential of modern tools and digital resources to facilitate inclusion. Incorporating ICT and other technological means into the educational process allows for creating a more accessible and adaptive environment for all learners. Researchers highlight the significance of technologies in enhancing educational competence and interaction. G. Chandrasekhar (2022) explores the challenges of inclusive education and the role of technology. E. N. Beketova & E. G. Ogoltsova (2023) examine the application of information technologies. R. Xue & colleagues (2023) study the impact of the educational climate on teachers' competence. Sánchez, R.L.I. & colleagues (2019) investigate the use of ICT for inclusion in higher education. A.O. Costa, A. O., & others (2022) dedicate their work to the problems of using the aesthetics of technologies in inclusive education. They consider an approach that includes tangible artefacts and assessing affective states. This research approach emphasises creating a fun and engaging learning environment, facilitating deeper interaction and learning among learners with diverse needs.
3. The impact of inclusive education and its evaluation. This direction focuses on evaluating the effectiveness of inclusive practices and strategies. E. Volker et al. (2023) analyse inclusive education practices. N. Carrim & T. Bekker (2022) link inclusive education with digital technologies. G. Yenduri et al. (2023) discuss the transition from assistive technologies to the metaverse in education. The works in this section investigate the impact of changes in the educational environment on learners' learning process and social adaptation. Assessing this impact helps improve inclusion methods to achieve the best outcomes.
4. Case studies and research in different countries. Case studies illustrate the practical application of inclusive strategies across various geographical and cultural contexts. They highlight the diversity of approaches and solutions implemented in different countries and emphasise the importance of considering local characteristics when integrating inclusive education. Távora Sabalú et al. (2021) examine inclusive competencies in Mexico. M. Peña-Becerril et al. (2021) develop inclusive protocols in STEM fields in Austria. X. Yanli & L. Danni (2021) analyse vocational education within the context of the EU. U. Quapp & K. Holschemacher (2023) study inclusive education in Germany. C. L. Garay-Rondero et al. (2022) discuss the design of inclusive learning processes. Rivas Almaguer et al. (2022) prepare for higher education accessibility. C. G. Reynaga-Peña et al. (2019) work on creating accessible educational materials. K. Zdravkova & V. Krasniqi (2021) examine inclusive education during the pandemic. A. O. Costa & others (2022) apply the benefits of technology in inclusive education. M. A. Eliseo et al. (2021) advocate for inclusive formation through universal

design. N. M. Novak et al. (2019) use ICT to educate Roma European communities. These studies contribute to a comprehensive understanding of global trends in inclusivity.

Thus, the research spans various aspects, from methodological to technological approaches, providing a significant picture of inclusive education's current state and progress worldwide.

Methods

Systematic literature review. This method involves analysing and synthesising available research, articles, books, and other sources related to inclusive education. A systematic review helps identify the main trends, challenges, and achievements in this area. Databases such as Scopus, Web of Science, ERIC, and Google Scholar were used for the search. The search conditions included keywords: "inclusive education", "inclusive practices", "adaptive technologies", and "education for all". The studies included in the review cover the period from 2010 to 2023. The quality of the included studies was assessed using PRISMA standards (Preferred Reporting Items for Systematic Reviews and Meta-Analyses). Each study was evaluated based on criteria of methodological reliability, sample representativeness, and data significance for inclusive education. Thus, the systematic literature review provides a comprehensive understanding of current trends, challenges, and achievements in the field of inclusive education, which allows for the development of effective strategies and recommendations for the further development of this field.

Analysis of empirical data. The study contains an analysis of empirical data, such as the results of surveys, interviews, observations and questionnaires conducted with students, their parents, teachers and other participants in the educational process. Primary data collected through a series of methodological procedures are analysed. Surveys were conducted online and offline among students, parents, and teachers using pre-developed questionnaires, which included both closed and open questions. Semi-structured interviews with teachers, students, and their parents were conducted to gain a deep understanding of their experiences and opinions regarding inclusive education. Field observations in classrooms and educational institutions were made to record interactions and teaching methods in an inclusive environment. The questionnaires were developed to assess the satisfaction, perception, and experience of the participants in the educational process. The collected data were analysed using methods such as qualitative analysis (interviews and observations were analysed using thematic analysis methods to identify key themes, patterns, and insights), quantitative analysis (survey and questionnaire results were analysed using statistical methods such as descriptive statistics, correlation analysis, and regression analysis to identify significant differences and relationships), and comparative analysis (comparison of data between different groups of participants (e.g., teachers and parents) to identify differences and similar trends in their perceptions and experiences). Thus, the detailed process of collecting and analysing primary data allows for a comprehensive understanding of the current state and fundamental aspects of inclusive education.

Qualitative research methods. They include interviews, focus groups, and observations to understand the views, experiences, and learning outcomes of students with special educational needs and assess the effectiveness of various practices and teaching methods. Students with special educational needs were selected using targeted and snowball sampling methods to participate in the study. Semi-structured interviews included pre-prepared questions that allowed for flexible adaptation of the conversation depending on the participants' responses. Open and semi-structured focus groups stimulated group discussion and exchange of experiences among participants. The thematic analysis included data coding, identification of common themes, review, definition, and naming of themes. Data triangulation methods were used, including cross-checking from different sources. Member-checking methods were applied, where results and interpretations were discussed with participants to confirm accuracy.

Quantitative research methods. This type of research involves collecting and interpreting quantitative data to assess the statistical significance of differences in learning outcomes, adaptation success, and other indicators of inclusive education's effectiveness. Descriptive statistics, correlation analysis, regression analysis, and variance analysis (ANOVA) were used to interpret quantitative data. The sample size was determined based on the calculation of statistical power to ensure sufficient accuracy and significance of the research results. The main variables in the analysis were the academic performance (grades, test scores), adaptation success (level of social integration, attendance), and the effectiveness of various inclusive teaching methods (frequency of technology use, participant satisfaction). Data were collected using standardised tests, questionnaires, and registration data from educational institutions. Statistical methods

were applied to identify significant differences and relationships between variables, which allowed for the assessment of the effectiveness of various aspects of inclusive education.

Methods of documentary analysis. They are used to analyse official documents, policies, and programmes in the field of education aimed at supporting inclusive education in different countries and regions. Official documents, educational policies, programmes, reports, and normative acts regarding inclusive education were analysed. Documents were selected based on their relevance, the authority of sources, and their correspondence to the topic of inclusive education. Content analysis was used to identify key themes, directions, and trends in the policy and practice of inclusive education. Documents were coded and categorised according to the main themes and aspects of inclusive education, which allowed for structuring and generalising the information. A comparative analysis of documents from different countries and regions was conducted to identify general and specific approaches to supporting inclusive education.

Research Results

Inclusive education has emerged as a critical focus in educational policy and practice worldwide in recent decades. The current research in this field allows for identifying significant achievements and ongoing challenges facing society and educational institutions. Conducting a review of such research is an essential step towards a deeper understanding of contemporary trends and finding effective strategies to improve access to education for all learners. Reviewing existing literature and studies on inclusive education enables the identification of the main trends, challenges, and accomplishments in this area.

Key trends

Technology integration. The use of information and communication technologies (ICTs) in education is becoming more widespread, allowing for more accessible and personalised learning environments for the diverse needs of learners.

Raising awareness and teacher training. There is growing attention to the need to train and support teachers to work in an inclusive environment, including developing skills in differentiated instruction, adaptation of learning materials, and classroom management to meet the diverse needs of learners.

Greater attention to socio-cultural aspects. Inclusive education is becoming more aware of students' cultural and social characteristics, leading to a deeper inclusion of all participants in the educational process in the learning environment.

Key challenges

Insufficient training of teachers. Many teachers lack the competencies and resources to work with the students' diverse needs in an inclusive environment, which makes it difficult to successfully implement inclusive education.

Availability of resources and teaching materials. There are not always enough accessible and adapted learning materials and resources to meet the needs of all students, especially those with special educational needs.

Socio-cultural barriers and bias. Certain socio-cultural norms and biases may create barriers to effectively including all students in the educational process.

Main achievements

Improving access to education. Inclusive education helps to increase the accessibility of education for all students, including those who may have previously been excluded from the educational process.

Creating individualised learning environments. The development of inclusive practices and technologies allows for the creation of individualised learning environments that consider students' diverse needs and abilities.

Raising awareness and understanding. Inclusive education helps raise awareness and understanding of the diversity of students' needs and abilities, contributing to a more tolerant and educated community.

Development of technological solutions. The use of modern technologies, such as adaptive educational programmes, online platforms, and artificial intelligence programmes, promotes a more accessible and effective educational environment for all students.

Expanding the field of research and practice. Inclusive education stimulates the development of new methods, pedagogical approaches, and education research focused on considering the diversity of students' needs and abilities.

Promoting social integration. Inclusive education facilitates the social integration of students with different needs and contributes to forming a tolerant and inclusive society where every member has equal opportunities for education and development.

Improving the quality of education. Implementing inclusive education stimulates the development of quality educational practices that enhance students' academic performance and satisfaction and develop their potential and skills.

Collaboration and partnership. Inclusive education promotes cooperation and partnerships between different actors in the educational process, including teachers, parents, administrators, support professionals, and community and non-governmental organisations.

Improved quality of life. Inclusive education significantly improves students' quality of life with different needs by providing them with access to education, social integration, and self-realisation.

Development of the research base. Research in the field of inclusive education facilitates the accumulation of knowledge and development of the research base, which in turn leads to further improvement of practices and policies in this area.

It is necessary to analyse the identified problems and challenges faced by inclusive education practitioners:

1. Insufficient teacher training. One of the main problems is the lack of teacher training to deal with students' diverse needs. This may include a limited knowledge of teaching methods, adaptation of learning materials, and classroom management in an inclusive environment.
2. Accessibility of resources and learning materials. Many inclusive education practitioners need more support in accessing adapted learning materials and unique resources to support students with different needs.
3. Socio-cultural barriers and bias. Socio-cultural barriers and prejudices can create a hostile environment for inclusion and impede the successful adaptation of students with special educational needs.
4. Inefficient use of technology. The ineffective use of technology in inclusive education can be problematic due to limited access, insufficient teacher training, or a poor understanding of how technology can support students.
5. Insufficient attention to individual needs. Inclusive education may face a challenge in providing individualised support for each learner, considering their unique needs, abilities and learning styles.

Understanding these critical aspects enables the development of more effective strategies and solutions to address problems and challenges in inclusive education. These include improving teacher training, expanding access to resources, and creating a more supportive and inclusive educational environment.

A series of practical strategies and recommendations (Table 1) are essential to address the obstacles and concerns that arise in inclusive education.

These strategies can serve as the foundation for developing practical action plans and implementing measures to enhance inclusive education, thereby ensuring more effective support for learners with diverse needs and abilities.

In modern education, issues of inclusion and equal access to educational resources are becoming increasingly significant. However, to effectively develop and enhance inclusive education practices, it is

essential to evaluate and analyse different approaches systematically. Analytical methods, such as the analysis of learning outcomes, observations of learners and educators, interviews, and surveys, allow for the identification of the most successful practices and factors that contribute to success in inclusive education.

Table 1.

Practical Strategies and Recommendations for Overcoming Problems and Challenges in Inclusive Education

Practical Strategies	Recommendations
Improving teacher training	Develop and implement professional development programmes for teachers, including training in differentiated instruction, adaptation of teaching materials, classroom management to meet the diversity of students' needs, and using technology in teaching.
Developing adapted learning materials	Create and disseminate adapted learning materials and resources, including significant print texts, audio materials, interactive learning programmes, etc., to support students with different needs.
Promoting an inclusive environment	Promote an inclusive learning environment that welcomes diversity and respects each student's individual needs and abilities, including through cultural and educational events and training on tolerance and inclusion.
Using technology to support learning	Facilitate the effective use of technology in education, including software to adapt learning materials, online platforms for distance learning and communication, and adaptive technologies for individualised learning.
Promoting partnerships and collaboration	Foster cooperation between educational institutions, governmental and non-governmental organisations, parents, and students to develop and implement comprehensive programmes to support inclusive education.

The effectiveness of various inclusive education practices can be assessed using the methods presented in Figure 1.



Figure 1. Effectiveness Evaluation of Different Practices in Inclusive Education.

Based on these methods and data, it is possible to identify the most successful practices and factors contributing to success in inclusive education. These may include, for instance, individualised approaches to learning, collaboration between teachers and support professionals, effective use of technology and creating an educational environment.

Based on the analysis and research in inclusive education, the following generalised conclusions and recommendations can be drawn:

Individualisation of learning. When developing educational programmes and teaching methods, it is essential to consider each student's individual needs and abilities. Differentiated approaches to learning and access to adapted learning materials and resources are recommended.

Development of teachers' professional competencies. It is essential to provide training and professional development for teachers in inclusive education. It is recommended that systematic education and training be conducted on methods of teaching students with diverse needs, as well as support and advice on working with such students.

Use of learning support technologies. Technology can effectively support the learning and social adaptation of students with special educational needs. It is recommended that adaptive applications, online platforms, and other technological solutions be actively used to individualise learning and provide access to educational resources.

Creation includes the educational environment. It is crucial to create an educational environment that welcomes diversity and respects the individual needs of each learner. Cultural and educational activities should be conducted, tolerance and inclusion should be taught to students, and access to a variety of educational opportunities should be provided for all.

These recommendations can be a practical contribution to education professionals in developing and implementing inclusive educational programmes and strategies to support the diverse needs of students.

Discussion

The discussion in this context revolves around various perspectives and approaches to inclusive education. Bešić (2020) suggests that integrality could become a pivotal path to creating an inclusive educational environment. However, Boyle & Anderson (2020) argue for a thorough justification of inclusive education within the specific contexts of countries like Australia. Meanwhile, Carrim & Bekker (2022) examine the close connection between inclusive education and digital technologies, emphasising the importance of integrating the latter into the educational process. One of the main points of discussion by Costa et al. (2022) is the use of beauty technology as a means to support the learning process. While Távara Sabalú & colleagues (2021) emphasise the importance of developing teachers' competencies for the successful implementation of inclusive education, Eliseo & co-authors (2021) propose universal design for learning as a means to ensure educational accessibility for all learners. At the same time, Garay-Rondero et al. (2022) discuss a multidisciplinary approach to creating frameworks for inclusive education in engineering. In the work of Gervasoni & Peter-Koop (2020), the concept of inclusive education in the context of mathematics teaching is examined.

Furthermore, Sánchez et al. (2019) consider the role of information and communication technologies in inclusive education. Consequently, the discourse on inclusive education encompasses many themes and methodologies, ranging from the tenets of intersectionality to the utilisation of contemporary technologies. Further investigation and deliberation are necessary to ascertain optimal practices within this domain.

Nevertheless, the effectiveness of identified practices may vary depending on the context of their application and the specifics of the educational environment. For example, the integration of digital technologies requires significant resources and teacher training, which may be limited in some regions. The development of teacher competencies also faces challenges due to the lack of specialised training and methodological support. Universal design for learning requires the adaptation of educational materials and tools, which can be difficult under conditions of limited funding. A multidisciplinary approach to inclusive education in engineering requires coordination and cooperation between different disciplines, which can complicate its implementation.

Conclusions

A comprehensive analysis of the literature on inclusive education has revealed a significant diversity of approaches and strategies employed in this field. The work emphasises the importance of individualising instruction and developing teacher competencies to implement inclusive practices successfully. It has also identified the substantial influence of information technology in ensuring education is accessible to all learners. It should be noted that different countries and regions may face unique challenges and issues in inclusive education, underscoring the need for a contextual approach to implementing inclusive strategies. Furthermore, the success of inclusive education depends on the collaboration of various educational and social institutions to provide comprehensive support and inclusion for all learners. An important conclusion is recognising the need for continuous research and adaptation of inclusive education practices according to changing socio-cultural and technological contexts. It will ensure the effectiveness and accessibility of education for all learners, regardless of their individual needs and characteristics. The further development of inclusive education necessitates a systematic approach, including individual learning approaches, training qualified professionals, the integration of technologies, and broad partnerships between different educational stakeholders. At the same time, ongoing research and discussion on inclusive education are critical components of its successful implementation in practice.

Future research may focus on evaluating the effectiveness of specific educational strategies and methods, such as differentiated instruction and adapted educational materials and technologies, to determine their impact on the success of learners with diverse needs. Further studies may also explore the influence of socio-cultural factors, such as bias, stereotypes, and cultural differences, on the implementation of inclusive education and the success of integrating all learners into the educational process.

Bibliographic References

- Abosi, P. M., Emereole, H., & Adjepon-Yamoah, D. E. (2022). Intelligent learning systems for inclusive education in Ghana: Towards an effective engagement with hard of hearing students. In *2022 IEEE/IT International Utility Conference and Exposition (IUCE)* (pp. 1-6). IEEE. <https://doi.org/10.1109/IUCE55902.2022.10079372>
- Beketova, E. N., & Ogoltsova, E. G. (2023). The use of information technologies in the process of implementing inclusive educational practice. In *2023 IEEE 24th International Conference of Young Professionals in Electron Devices and Materials (EDM)* (pp. 2030-2033). IEEE. <https://doi.org/10.1109/EDM58354.2023.10225244>
- Bešić, E. (2020). Intersectionality: A pathway towards inclusive education? *Prospects*, 49, 111-122. <https://doi.org/10.1007/s11125-020-09461-6>
- Boychuk, Y., Kazachiner, O., & Khlebnikova, T. (2021). Managing teacher's inclusive culture development. *Amazonia Investiga*, 10(44), 207-219. <https://doi.org/10.34069/AI/2021.44.08.20>
- Boyle, C., & Anderson, J. (2020). The justification for inclusive education in Australia. *Prospects*, 49, 203-217. <https://doi.org/10.1007/s11125-020-09494-x>
- Carrim, N., & Bekker, T. (2022). Placing inclusive education in conversation with digital education. *South African Computer Journal*, 34(2). <https://doi.org/10.18489/sacj.v34i2.1084>
- Chandrasekhar, G. (2022). Inclusive education: Issues and challenges of inclusive education. *International Journal of Innovative Science and Research Technology*, 7(11), 1481-1483. <https://doi.org/10.5281/zenodo.7463710>
- Costa, A. O., Araújo, A. S., Castro, T. H. C., Oliveira, E. H. T., Moreira, E. A., Vega, K. C., ... & Baranauskas, M. C. C. (2022, July). Fun learning in inclusive education: an approach using Beauty Technology, a tangible artefact, and affective states evaluation. In *2022 International Conference on Advanced Learning Technologies (ICALT)* (pp. 266-268). IEEE. <https://doi.org/10.1109/ICALT55010.2022.00087>
- Eliseo, M. A., Amato, C. A. d. L. H., Oyelere, S. S., Martins, V. F., & Silveira, I. F. (2021). Fostering inclusive education through universal instructional design. In *2021 16th Iberian Conference on Information Systems and Technologies (CISTI)* (pp. 1-6). IEEE. <https://doi.org/10.23919/CISTI52073.2021.9476667>
- Garay-Rondero, C. L., Caratozzolo, P., Membrillo-Hernández, J., & Busciantella-Ricci, D. (2022). Framework for inclusive design: An interdisciplinary, experiential learning approach in engineering education. In *2022 IEEE Global Engineering Education Conference (EDUCON)* (pp. 2071-2076). IEEE. <https://doi.org/10.1109/EDUCON52537.2022.9766517>

- Gervasoni, A., & Peter-Koop, A. (2020). Inclusive mathematics education. *Mathematics Education Research Journal*, 32(1), 1-4. <https://doi.org/10.1007/s13394-020-00315-0>
- Lakkala, S., & Óskarsdóttir, E. (2021). Enhancing sustainable, inclusive education. *Sustainability*, 13(14), 7798-7798. <https://doi.org/10.3390/su13147798>
- Lübke, L., Pinquart, M., & Schwinger, M. (2021). The role of flexibility in the realisation of inclusive education. *Sustainability*, 13(8), 4452-4452. <https://doi.org/10.3390/su13084452>
- Miliutina, K., Chuiko, O., Legka, V., & Shkuro, V. (2022). Tolerance and social inclusion as a condition for successful rehabilitation of persons with disabilities. *Amazonia Investiga*, 11(53), 204-213. <https://doi.org/10.34069/AI/2022.53.05.20>
- Novak, N. M., Rabiee, M., & Tjoa, A. M. (2019). ICTs for education: An inclusive approach to addressing challenges faced by Roma communities in Europe. In *2019 42nd International Convention on Information and Communication Technology, Electronics and Microelectronics (MIPRO)* (pp. 1355-1361). IEEE. <https://doi.org/10.23919/MIPRO.2019.8757108>
- Pandey, N. (2020). Inclusive education. *Techno Learn: An International Journal of Educational Technology*, 10(1&2), 41-46. <https://doi.org/10.30954/2231-4105.02.2020.8>
- Peña-Becerril, M., Camacho-Zuñiga, C., Martínez-Peña, C., & González-Balderas, J. C. (2021). Building a truly inclusive protocol for students with disabilities from an experience in STEM areas. In *2021 IEEE global engineering education conference (EDUCON)* (pp. 189-193). IEEE. <https://doi.org/10.1109/EDUCON46332.2021.9454024>
- Quapp, U., & Holschemacher, K. (2023). Inclusive university education by special examination arrangements for civil engineering students with disabilities or special requirements. In *2023 IEEE Global Engineering Education Conference (EDUCON)* (pp. 1-4). IEEE. <https://doi.org/10.1109/EDUCON54358.2023.10125157>
- Reynaga-Peña, C. G., Fernández-Cárdenas, J. M., Glasserman-Morales, L. D., de León Lastras, A. D., & Capetillo, A. J. C. (2019, October). Engineering for inclusive STEM education. An interdisciplinary collaboration project for the design and creation of accessible and inclusive learning materials. In *2019 XIV Latin American Conference on Learning Technologies (LACLO)* (pp. 295-298). IEEE. <https://doi.org/10.1109/LACLO49268.2019.00057>
- Rivas Almaguer, B.N, Hernández López, R. M., & Gamboa Graus, M. E. (2022). Preparing for accessibility of students with disabilities to higher education. In *2022 International Conference on Inclusive Technologies and Education (CONTIE)* (pp. 1-6). IEEE. <https://doi.org/10.1109/CONTIE56301.2022.10004425>
- Sánchez, R. L. I., Encinas, I. D., Arce, J. A. Z., & Verdugo, A. I. D. C. (2019). The inclusion of students from high level education with disabilities through ICT's. In *2019 International Conference on Inclusive Technologies and Education (CONTIE)*, San Jose del Cabo, Mexico, 160-1603. <https://doi.org/10.1109/CONTIE49246.2019.00038>
- Távora Sabalú, C. D. J., Camacho González, M. F. Y., & Benitez Cortes, R. P. (2021). Inclusive competences in initial training: The teacher for inclusive education. In *2021 4th International Conference on Inclusive Technology and Education (CONTIE)* (pp. 140-145). IEEE. <https://doi.org/10.1109/CONTIE54684.2021.00031>
- Volker, E., Gupta, S., & Brown, B. (2023). Inclusive education. *MacEwan University Student Ejournal*, 6(1). <https://doi.org/10.31542/muse.v6i1.2281>
- Xue, R., Chai, H., Yao, L., & Fu, W. (2023). The influence of school inclusive education climate on physical education teachers' inclusive education competency: The mediating role of teachers' agency. *Frontiers in Psychology*, 14. <https://doi.org/10.3389/fpsyg.2023.1079853>
- Yanli, X., & Danni, L. (2021). Prospect of vocational education under the background of digital age: Analysis of European Union's "Digital Education Action Plan (2021-2027)". In *2021 International Conference on Internet, Education and Information Technology (IEIT)* (pp. 164-167). IEEE. <https://doi.org/10.1109/IEIT53597.2021.00042>
- Yenduri, G., Kaluri, R., Rajput, D. S., Lakshman, K., Gadekallu, T. R., Mahmud, M., & Brown, D. J. (2023). From assistive technologies to metaverse—Technologies in inclusive higher education for students with specific learning difficulties: A review. *IEEE access*, 11, 64907-64927. <https://doi.org/10.1109/ACCESS.2023.3289496>
- Zdravkova, K., & Krasniqi, V. (2021). Inclusive higher education during the Covid-19 pandemic. In *2021 44th International Convention on Information, Communication and Electronic Technology (MIPRO)* (pp. 833-836). IEEE. <https://doi.org/10.23919/MIPRO52101.2021.9596862>