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Needs Analysis for the Development of Interactive Learning Media Based on Articulate Storyline for Students with Intellectual Disabilities

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Abstract: This study examines the mismatch between the learning characteristics of students with intellectual disabilities and the conventional instructional media used in classrooms, highlighting the need for adaptive, technology-based solutions. The aim of this study is to analyze the needs for developing interactive learning media using Articulate Storyline that integrates visual and audio elements for students with intellectual disabilities. A mixed-methods approach was employed within the ADDIE Research and Development (R&D) model, with a focus on the needs analysis stage. Data were collected through classroom observations, semi-structured interviews with teachers, and Likert-scale questionnaires administered to three special education teachers. The findings indicate that students showed higher engagement when learning materials incorporated animation and audio, while teachers emphasized the need for contextual, flexible, and interactive media to support instructional delivery. The average questionnaire score of 3.46 reflects a high perceived need for innovative learning media. However, these findings are limited to a small sample within a single school context and should be interpreted cautiously. This study contributes to identifying key requirements for developing multimedia-based interactive learning media in special education. The results provide initial empirical insights to inform future design and development stages, as well as teacher training programs aimed at improving the use of technology in special education settings.

Keywords: intellectual disabilities; interactive learning media; Articulate Storyline; teachers' needs; educational multimedia.

INTRODUCTION

In the Fourth Industrial Revolution era, the integration of technology into education has become increasingly essential for supporting meaningful learning and developing 21st-century skills (Kalyani, 2024; Reaves, 2019). This transformation is particularly important in inclusive education settings, where students with special needs, including those with intellectual disabilities, require adaptive and flexible instructional approaches that align with their unique learning characteristics (Mitchell & Sutherland, 2020; Tsaputra & Amani, 2025).

Despite the growing emphasis on technology integration, a significant gap remains between the availability of instructional media and the actual needs in special education classrooms (Hata et al., 2023). Reports indicate that although many special education teachers recognize the importance of assistive and technology-based learning tools, they often face limitations in access, training, and the availability of appropriate media (Nurhastuti et al., 2024; Rismayanti & Citra Wibawa, 2024). As a result, conventional teaching methods still dominate classroom practices, which may not effectively support the learning needs of students with intellectual disabilities (Heliawati et al., 2022; Rahmahtrisilvia et al., 2024).

Students with intellectual disabilities typically experience limitations in cognitive functioning, including difficulties in abstract thinking, attention span, memory retention, and problem-solving (Sundari & Aprilia, 2022; Sindu et al., 2020). They tend to learn more effectively through concrete, visual, and repetitive instructional approaches (Dewi, 2025). Therefore, instructional media that integrate visual and auditory elements can play a crucial role in enhancing their engagement and supporting better understanding of learning content (Anjelina et al., 2024).

Previous studies have shown that interactive multimedia, including those developed using Articulate Storyline, can improve student participation and learning outcomes in general education contexts (Sushanty et al., 2023; Ulutaş et al., 2025). These media allow the integration of animation, audio narration, and interactive features, which are beneficial for creating more engaging learning environments (Kormos & Smith, 2023). However, most existing studies focus on general student populations and specific subject areas, with limited attention given to students with intellectual disabilities.

Furthermore, studies that specifically explore teachers' needs in designing and implementing interactive learning media for students with intellectual disabilities remain scarce. In particular, there is a lack of research that integrates both teacher perspectives and student learning characteristics within the Merdeka Curriculum framework. This indicates a critical gap in the development of needs-based instructional media tailored for special education contexts.

Based on this gap, this study aims to analyze the needs for developing interactive learning media using Articulate Storyline that integrates visual and audio elements for students with intellectual disabilities. The findings of this study are expected to provide a foundation for future development of adaptive learning media and to support teachers in implementing technology-based instruction in special education settings.

METHOD

This study employed a mixed-methods approach, combining qualitative and quantitative data to obtain a comprehensive understanding of the learning media needs of students with intellectual disabilities. The qualitative component was prioritized to explore in-depth insights from classroom practices and teacher perspectives, while the quantitative data were used to support and strengthen the findings through descriptive analysis (Creswell & Clark, 2017).

The research was conducted within the framework of the Research and Development (R&D) methodology, using the ADDIE model, with a focus on the analysis stage (needs assessment) (Moon, 2019). This stage is essential, as it provides an empirical foundation for developing instructional media based on actual field conditions (Sugiyono, 2019).

The study was carried out at a special school (Sekolah Luar Biasa/SLB) in Muara Bungo, Jambi, Indonesia. The participants consisted of three special education teachers who teach students with intellectual disabilities at the fifth-grade level. The selection of participants was conducted using purposive sampling with the following criteria: (1) being a permanent teacher; (2) having at least two years of teaching experience; and (3) actively teaching core subjects such as Science and Social Studies (IPAS). Although the number of participants was limited, they were selected for their direct involvement in the teaching process, enabling in-depth exploration of contextual needs rather than generalization.

Data were collected through classroom observations, semi-structured interviews, and a questionnaire. Classroom observations were conducted over several learning sessions to examine students' engagement, attention, and responses to instructional media used in conventional teaching. The observation instrument included indicators of visual attention, response to auditory stimuli, and participation in learning activities. Semi-structured interviews were conducted with each teacher to explore their experiences, challenges, and expectations regarding the use of technology-based learning media. In addition, a questionnaire using a four-point Likert scale was administered to identify teachers' needs for interactive learning media.

The research instruments were validated through expert judgment involving specialists in special education and educational technology to ensure content validity. The reliability of the questionnaire was tested using Cronbach's Alpha coefficient to ensure internal consistency.

Qualitative data from interviews were analyzed using thematic analysis. The analysis process involved several stages, including open coding to identify initial concepts, categorization to group similar codes, and the development of overarching themes that represent teachers' needs and challenges (Donkoh, 2023). Quantitative data from the questionnaire were analyzed using descriptive statistics in SPSS to calculate mean scores and standard deviations.

To enhance the credibility of the findings, data triangulation was applied by comparing results from observations, interviews, and questionnaires. This approach allowed for cross-validation of findings and provided a more comprehensive understanding of the learning media needs in special education contexts.

FINDING AND DISCUSSION

Finding(s)

The findings of this study are presented based on data obtained from classroom observations, teacher interviews, and questionnaires. These data sources were triangulated to provide a comprehensive understanding of students with intellectual disabilities' learning media needs within the observed context.

Classroom observations of three fifth-grade students with intellectual disabilities revealed that conventional instructional approaches have not fully supported student engagement. The observed students demonstrated higher levels of attention and responsiveness when instructional materials incorporated visual elements, such as animations, and auditory components, such as narration. Conversely, low participation was observed in indicators related to students' initiative to ask questions, suggesting challenges with verbal expression and difficulties understanding abstract concepts.

To provide a clearer overview of observational findings, student learning activities were analyzed using several behavioral indicators, including attention, responses to stimuli, and participation. The results suggest that visual and auditory stimuli play important roles in attracting students' attention during the learning process. However, these findings are limited to a small number of observed students and should be interpreted as preliminary indications rather than generalizable conclusions.

Further observations indicated that students tended to lose focus easily and were highly dependent on teacher guidance to complete learning tasks. Nevertheless, when instructional media included visual and auditory elements, engagement increased during classroom activities.

Findings from teacher interviews revealed several key themes, including: (1) challenges in delivering abstract learning content; (2) limitations of existing instructional media; (3) the need for interactive and flexible learning tools; (4) readiness to adopt technology; and (5) expectations for future media development. Teachers emphasized that subjects such as Science and Social Studies (IPAS) are particularly difficult to teach using conventional approaches, as students require more concrete and visually supported explanations.

Quantitative data obtained from the questionnaire further supported these findings. As shown in Table 1, the average score of 3.46 indicates a high perceived need for interactive learning media among teachers.

Table 1. Summary of Quantitative Questionnaire Results

Respondent	Total Score	Average
AD	72	3.60
RE	67	3.35
SR	69	3.45

Several questionnaire items, particularly those related to the use of animation, audio features, and flexible learning media, received high ratings. This indicates that teachers expect learning media that are not only interactive but also adaptable to different learning contexts. However, these findings should be interpreted cautiously due to the limited number of respondents.

Overall, the triangulated findings suggest that there is a gap between the learning needs of students with intellectual disabilities and the instructional media currently used in classrooms. These results provide an initial empirical basis for developing interactive learning media that integrate visual and auditory elements while remaining grounded in the actual needs of teachers and students in special education settings.

Discussion

The findings of this study emphasize the importance of aligning instructional media with the cognitive and learning characteristics of students with intellectual disabilities. The observed increase in student engagement when using visual and auditory elements supports the Cognitive Theory of Multimedia Learning, which suggests that integrating verbal and visual information can enhance comprehension, particularly for learners with limited cognitive capacity (Mayer, 2021).

In addition, the difficulties students experience in understanding abstract learning content are consistent with Vygotsky's concept of the Zone of Proximal Development (ZPD). This theory highlights the importance of providing appropriate scaffolding to help learners bridge the gap between what they can achieve independently and what they can achieve with assistance. In this context, interactive learning media can serve as instructional scaffolds by presenting abstract concepts in more concrete, accessible forms.

However, while multimedia-based learning offers significant potential, its implementation must be approached with caution. The excessive use of animations, sounds, and interactive elements may lead to cognitive overload, particularly for students with intellectual disabilities who have limited information-processing capacity. Therefore, the design of instructional media should prioritize simplicity, clarity, and relevance to avoid overwhelming learners.

Furthermore, it is important to recognize that students with intellectual disabilities are not a homogeneous group. They exhibit varying levels of cognitive ability, attention span, and learning pace. As a result, a single type of instructional media may not be equally effective for all students. This highlights the need for adaptive, flexible learning media that can accommodate diverse learning needs in special education settings.

From the teachers' perspective, the findings indicate a strong demand for interactive and technology-based learning media (Abedi, 2024). However, challenges related to limited technological skills, lack of training, and restricted access to resources remain significant barriers to implementation. This suggests that the successful integration of tools such as Articulate Storyline depends not only on the availability of the technology but also on teachers' readiness and professional development.

While Articulate Storyline offers features that support the integration of animation, audio, and interactivity, its effectiveness depends largely on how it is designed and implemented (Xie & History, 2025). Without proper instructional design considerations, such as aligning content with students' cognitive levels and avoiding excessive complexity, the use of such tools may not yield optimal learning outcomes.

This study is limited by the small number of participants and its focus on a single school context. Therefore, the findings should be interpreted cautiously and cannot be generalized to broader populations. Future research is recommended to involve larger samples and to further develop and evaluate interactive learning media in diverse special education contexts.

CONCLUSION

This study highlights the gap between the learning characteristics of students with intellectual disabilities and the instructional media currently used in special education classrooms. The findings indicate that students tend to show higher engagement when learning materials incorporate visual and auditory elements, while conventional approaches are less effective in supporting their understanding of abstract content. From the teachers' perspective, the results suggest a strong need for interactive, flexible, and technology-based learning media that can accommodate students' learning characteristics. The average questionnaire score further supports this indication, reflecting teachers' expectations for more adaptive and engaging instructional tools. However, these findings are limited to a small number of participants within a single school context and should therefore be interpreted with caution. This study does not aim to generalize the results, but rather to provide an initial understanding of learning media needs in a specific special education setting. The results of this study provide a foundation for future research, particularly in the design and development of interactive learning media based on Articulate Storyline. Further studies are recommended to involve larger samples, develop prototype media, and evaluate their effectiveness in real classroom settings. In addition, future research should consider the diversity of students' cognitive abilities to ensure that the developed media are inclusive and adaptable.

REFERENCES

Abedi, E. A. (2024). Tensions between technology integration practices of teachers and ICT in education policy expectations: Implications for change in teacher knowledge, beliefs and teaching practices. *Journal of Computers in Education, 11*(4), 1215–1234. https://doi.org/10.1007/s40692-023-00296-6

Anjelina, W., Tang, S., Aisa, S., Hikmah, N., Hermansyah, S., Muhammadiyah, U., & Rappang, S. (2024). Models of English learning for students with disabilities at SLB Negeri 1 Sidrap. *Interaction Journal, 11*(2), 892–904. https://doi.org/10.36232/interactionjournal.v11i2.1176

Creswell, J. W., & Plano Clark, V. L. (2017). *Designing and conducting mixed methods research* (3rd ed.). Sage.

Dewi, R. D. C. (2025). Strata International Journal of Social Issues. *Strata International Journal of Social Issues, 2*(1), 37–44. https://doi.org/10.59631/sijosi.v2i1.283

Donkoh, S. (2023). Application of triangulation in qualitative research. *Journal of Applied Biotechnology & Bioengineering, 10*(1), 6–9. https://doi.org/10.15406/jabb.2023.10.00319

Hata, A., Wang, H., Yuwono, J., & Nomura, S. (2023). Teknologi asistif untuk anak-anak dengan disabilitas di sekolah inklusif dan sekolah luar biasa di Indonesia [Assistive technology for children with disabilities in inclusive and special schools in Indonesia]. World Bank.

Heliawati, L., Lidiawati, L., & Pursitasari, I. D. (2022). Articulate Storyline 3 multimedia based on gamification to improve critical thinking skills and self-regulated learning. *International*

Journal of Evaluation and Research in Education, 11(3), 1435–1444. https://doi.org/10.11591/ijere.v11i3.22168

Kalyani, L. K. (2024). The role of technology in education: Enhancing learning outcomes and 21st century skills. *International Journal of Scientific Research in Modern Science and Technology, 3*(4), 5–10. https://doi.org/10.59828/ijsrmst.v3i4.199

Kormos, J., & Smith, A. M. (2023). *Teaching languages to students with specific learning differences.* Channel View Publications.

Mayer, R. E. (2021). *Multimedia learning* (3rd ed.). Cambridge University Press.

Mitchell, D., & Sutherland, D. (2020). *What really works in special and inclusive education: Using evidence-based teaching strategies.* Routledge.

Moon, M. D. (2019). Triangulation: A method to increase validity, reliability, and legitimation in clinical research. *Journal of Emergency Nursing, 45*(1), 103–105. https://doi.org/10.1016/j.jen.2018.11.004

Nurhastuti, N., Iswari, M., Zulmiyetri, Z., Yuliana, S., Nasri, Y. Y., Zulpiani, M., & Handayani, E. S. (2024). Pelatihan pembuatan dan editing video berbasis aplikasi VN bagi guru SLB Negeri 1 Lubuk Sikaping untuk menghadapi era revolusi industri 4.0 [Training on video creation and editing using VN application for special school teachers in the industrial revolution 4.0 era]. Suluah Bendang: *Jurnal Ilmiah Pengabdian Kepada Masyarakat, 24*(2), 39. https://doi.org/10.24036/sb.05630

Rahmahtrisilvia, R., Amani, R., Mahdi, A., Luthfi, A., Efrina, E., Kusumastuti, G., Taufan, J., Zulmiyetri, Z., Budi, S., & Ardisal, A. (2024). A Mauro's popup book based on voice recognition: The implementation for learning Al-Qur'an of students with autism. *AIP Conference Proceedings, 3220*(1), 020027. https://doi.org/10.1063/5.0234863

Reaves, J. (2019). 21st-century skills and the fourth industrial revolution: A critical future role for online education. *International Journal on Innovations in Online Education, 3*(1). https://doi.org/10.1615/intjinnovonlineedu.2019029705

Rismayanti, N. M., & Citra Wibawa, I. M. (2024). Interactive learning video based on PBL in Pancasila education subject for grade IV elementary school. *International Journal of Elementary Education, 8*(4), 752–761. https://doi.org/10.23887/ijee.v8i4.91552

Sindu, I. G. P., Santyadiputra, G. S., & Permana, A. A. J. (2020). The effectiveness of the application of Articulate Storyline 3 learning object on student cognition in basic computer system courses. Jurnal Pendidikan Vokasi, 10(3), 290–299. https://doi.org/10.21831/jpv.v10i3.36094

Sugiyono. (2019). *Metode penelitian kualitatif, kuantitatif, dan R&D* [Qualitative, quantitative, and R&D research methods]. Alfabeta.

Sundari, T., & Aprilia, I. D. (2022). The effect of "KIS" (social interaction communication) application on augmentative and alternative communication to improve communication for Down syndrome students. *Journal of ICSAR, 8*(2), 237–244. https://doi.org/10.17977/um005v8i2p237

Sushanty, R., Valentina, T., Putri, K. D., Billy, B., & Arsanti, S. N. (2023). Development of decodable books to improve the beginning reading skills of students with reading disabilities at primary schools in Malang. *Journal of ICSAR, 8*(2), 286–295. https://doi.org/10.17977/um005v8i2p286

Tsaputra, A., & Amani, R. (2025). Indonesian Journal of Educational Development. Indonesian *Journal of Educational Development, 6*(3), 832–844.

Ulutaş, N. K., Durmaz, M. E., Elbuğa, N., Sezgin, S., Kaya, K., & İsmailoğulları, B. (2025). *The use of augmented reality (AR), virtual reality (VR), and artificial intelligence (AI) in language education: A systematic literature review.* In Reimagining Intelligent Computer-Assisted Language Education (pp. 401–430). https://doi.org/10.4018/979-8-3693-4310-4.ch015

Xie, L. (2025). Constructing an integrated problem-based and collaborative learning model: Empirical research on the development of fourth-grade primary school students' problem-solving and teamwork skills in mathematics class. *Asian Journal of Contemporary Education, 9*(1), 82–93. https://doi.org/10.55493/5052.v9i1.5318