

Exploring Interactive Learning Approaches and Technology Integration in the Kenyan Education System

*Roseline Nyamwamu Wangui¹, Richard Ronoh² and Yonah Etene²

¹University of Eastern Africa, Baraton, Kenya

²Kibabii University, Kenya

Abstract

This paper examines the dynamic intersection of interactive learning approaches and technology integration within contemporary education. As technology rapidly evolves, it fundamentally reshapes pedagogical practices by introducing innovative tools and strategies that redefine the teaching and learning landscape. We investigated the pivotal roles of Extended Reality (XR) technologies, including Virtual Reality (VR) and Augmented Reality (AR), in crafting immersive educational experiences. Additionally, interactive learning methodologies, such as game-based learning and the Learning by Asking (LBA) system, are scrutinized for their potential to engage learners and foster their skill acquisition. Furthermore, the emergence of competency-based education (CBE) models is analyzed in response to evolving educational objectives, emphasizing the cultivation of practical skills, problem-solving abilities, and commitment to lifelong learning. Nevertheless, the successful integration of these advancements encounters formidable challenges, including institutional barriers and the imperative need for comprehensive teacher training. This review illuminates the transformative potential of technology in education and underscores educators' pivotal role in equipping learners for an increasingly dynamic and uncertain future.

Keywords: Extended reality, education, competency-based education, learning

Introduction

In the dynamic landscape of modern education, the amalgamation of interactive learning approaches and technology integration has catalyzed a paradigm shift, redefining the essence of teaching and learning. The rapid evolution of technology has birthed an array of innovative tools and strategies that are reshaping traditional pedagogical methods, ushering in a new era of educational possibilities. As educators and learners navigate this intricate terrain, it becomes evident that the transformative potential of technology extends beyond convenience (Arif & Burcu, 2023; Boz & Dinç, 2023). Instead, it fosters immersive and engaging learning experiences that transcend the boundaries of conventional classroom settings.

This literature review embarks on a comprehensive journey, delving deep into the core of interactive learning methodologies and the seamless integration of technology within educational frameworks. The review serves as

a compass, navigating the complex interplay of interactive strategies and technological tools shaping modern education. It shines a spotlight on the revolutionary role of Extended Reality (XR) technologies—most notably Virtual Reality (VR) and Augmented Reality (AR)—as they blur the lines between the real and virtual, transporting learners into immersive educational realms that were once unimaginable (Bates 2019; Grace 2019; Zhao 2022).

Beyond XR, this review delves into interactive learning methods that utilize technology's capabilities (Özdemir et al., 2018; Kairu, 2021). Game-based learning has become a vibrant avenue tapping into human nature to play and foster meaningful learning experiences. The Learning by Asking (LBA) system offers another dimension, propelling learners to actively engage with content through tailored interactive presentations.

The emergence of competency-based education (CBE) models has further amplified

*Contact corresponding author: rose@ueab.ac.ke

the transformative potential of this amalgamation. The educational landscape is shifting towards equipping learners with practical skills, problem-solving abilities, and adaptability required in an ever-changing world (Mackatiani, 2018; Akinrinola et al., 2020; Ordu, 2021). The contours of modern curricula are being redrawn to focus on the outcomes and competencies that empower students to navigate real-world challenges with confidence and competence.

However, this profound transformation comes with several challenges. Institutional barriers and the need for effective teacher training are key impediments that must be overcome to harness the full potential of technology in education. As technology continues to disrupt traditional educational paradigms, educators stand at the forefront and serve as catalysts for change. The fusion of interactive learning approaches and technology provides a dynamic canvas for educators to craft innovative educational experiences to prepare learners for an increasingly complex and interconnected global landscape.

This literature review navigates the intricate intersections of interactive learning methodologies and technology integration, shedding light on their symbiotic relationship, transformative potential, and the path forward in shaping the future of education. The following questions guided this study:

1. How do interactive technologies impact student engagement and learning outcomes in Kenyan educational settings?
2. What are the most effective strategies for integrating interactive learning methodologies in Kenya?
3. How do competency-based education (CBE) models address evolving educational objectives in Kenya?
4. What are the main challenges faced in successfully integrating interactive technologies in Kenya?

Literature Review

In the contemporary educational landscape, the convergence of technology and interactive learning approaches has ushered in a profound shift in redefining the nature of teaching and learning. This literature review embarks on a comprehensive exploration of this transformative juncture, shedding light on the multifaceted interplay between interactive methodologies and technology integration. By examining the intricate nuances of these dynamics, this review elucidates the evolution of educational paradigms, emphasizing the revolutionary potential of Extended Reality (XR) technologies, game-based learning, interactive learning slides, and competency-based education (CBE) models, suggesting an awareness of the opportunities and challenges they present. A thorough investigation into educational technologies was conducted, focusing on the specific themes of the study. The search encompassed a wide range of sources to ensure comprehensiveness. Through this process, the findings and trends related to the selected technologies were synthesized. This synthesis involved analyzing and integrating key insights and discoveries from the literature to provide a comprehensive understanding of the subject matter.

Interactive Learning Approaches and Technology Integration

The evolution of educational methodologies reflects a shift from passive consumption of knowledge to active engagement. This evolution is underscored by interactive learning approaches that foster dynamic interactions among educators, learners, and content. These approaches catalyze engagement, critical thinking, and knowledge retention, transforming learners into active participants in their educational journey (Martinez-Lopez, 2020; Bugawa & Mirzal, 2018; Murithi and Yoo, 2021). Technology integration amplifies the impact of these approaches, enabling the creation of immersive learning environments that transcend traditional classroom constraints (Marcus, 2020; Fraillon et al., 2020).

In the context of the Kenyan educational system, the integration of interactive technologies presents a timely and transformative opportunity. The evolving landscape of education worldwide is mirrored in Kenya's pursuit of quality education, which equips students with the competencies needed for a rapidly changing world. Integrating extended reality (XR) technologies, game-based learning, interactive learning slides, and competency-based education (CBE) models holds immense potential for addressing challenges unique to the Kenyan context while harnessing the benefits of technological advancements.

Extended Reality (XR) Technologies: Augmented and Virtual Realities

Extended Reality (XR) technologies, encompassing both Augmented Reality (AR) and Virtual Reality (VR), stand as pioneering forces reshaping education. AR overlays digital elements onto the physical environment, whereas VR creates immersive digital worlds. The integration of AR and VR in education enhances engagement, fosters creativity, and provides experiential learning opportunities that are unattainable in traditional settings (Emspak, 2018; Pomerantz & Rode, 2020; Chang et al., 2018). Despite their transformative potential, the successful incorporation of XR technologies requires thoughtful planning, addressing technological challenges, and aligning with pedagogical goals (Khan et al., 2019; Marto & Gonçalves, 2022).

Kenya's education system faces various challenges, including resource constraints and the need to foster critical thinking and practical skills. The integration of XR technologies can bridge these gaps by providing immersive learning experiences that transcend the limitations of traditional classrooms. Augmented Reality (AR) and Virtual Reality (VR) can offer students hands-on experiences, making abstract concepts tangible and fostering a deeper understanding (Marto & Gonçalves, 2022). However, successful implementation necessitates overcoming infrastructural barriers, ensuring

equitable access to devices, and developing localized XR content that aligns with the Kenyan curriculum objectives.

Game-Based Learning: Bridging Play and Education

The marriage of education and play is embodied in game-based learning. As digital natives engage with technology, game-based approaches tap into their intrinsic motivation, propelling immersive learning experiences (Hwang & Cheng, 2022; Chen et al., 2018; Grace, 2019). Educational games cultivate critical thinking, problem-solving skills, and domain-specific knowledge while maintaining engagement through interactive gameplay (Hussein et al., 2019; Kucher, 2022). However, the diverse landscape of educational games necessitates a thoughtful selection process to align them with educational objectives and curricular content (Yapici & Karakoyun, 2021; Mundy et al., 2019).

Kenya's diverse student population requires innovative approaches that cater to various learning styles and backgrounds. Game-based learning can address this diversity by tapping into students' innate enthusiasm for technology and play. By introducing educational games tailored to local contexts, educators can foster engagement and nurture critical skills such as problem-solving and collaboration (Hussein et al., 2019; Wedyan et al., 2022). However, to realize the full potential of game-based learning, educators must invest in localized game development and training.

Interactive Learning Slides: Fostering Engaged Presentations

Interactive learning slides empower educators to transcend traditional presentations and offer a novel approach to classroom engagement. Technologies like VoiceThread facilitate dynamic interactions between instructors and learners, fostering collaborative learning experiences (Ningsih & Firmansyah, 2020; Zhao, 2022). The fusion of multimedia content and interactive elements bridges the gap

between auditory and visual learning modalities, catering to diverse learning preferences (Bates, 2019).

In a country where traditional teaching methods are predominant, interactive learning slides can revolutionize pedagogical delivery. Platforms such as VoiceThread can transform monotonous presentations into dynamic conversations, fostering interactive learning environments that encourage student participation and collaboration (Zhao, 2022). Implementing such technology can invigorate teaching practices, but it requires professional development initiatives to empower educators with the necessary skills and confidence to integrate these tools effectively.

Competency-Based Education (CBE): Shaping Future-Ready Learners

Competency-based education models epitomize a shift from content-focused to competency-driven outcomes. As education prepares learners for an ever-changing world, emphasis is placed on skills, critical thinking, and practical applications (Açıkgoz & Babadoğan, 2021; OECD, 2018). CBE aligns with global trends, equipping students with competencies essential for navigating complex challenges and dynamic careers (Akala, 2021; Maina & Waga, 2019). The evolution of curricula towards CBE underscores the role of education in cultivating adaptable lifelong learners.

Kenya's vision of preparing students for a dynamic workforce aligns with the principles of Competency-Based Education (CBE). This approach emphasizes skills, problem-solving, and practical application, aligning education with the needs of the job market (Akala, 2021). By embracing CBE models, Kenyan educators can shape students into adaptable, lifelong learners equipped to navigate the evolving career landscapes. However, transitioning to CBE requires a comprehensive curriculum redesign, teacher training, and support systems for assessment and evaluation.

The Role of Technology

Technology plays a crucial role in education by enhancing relationships between educators and students, transforming learning approaches, bridging accessibility gaps, and adapting to the needs of both the modern world and individual learners (Mwarari et al., 2020; Fraillon, 2020; Carstens et al., 2021). This fosters engagement, information access, collaboration, and innovative teaching methods. Technology allows for easy information access and creation, reduces the environmental impact, and enables distance learning. Various teaching methods, such as projectors, audio-visual presentations, simulations, and webinars, are efficient through technology.

Incorporating technology into education is essential due to its omnipresence in daily life and relevance to future job requirements. Educational leaders must ensure proper implementation and support for the use of technology. Among the various interactive technologies, Extended Reality (XR), including Augmented Reality (AR) and Virtual Reality (VR), has emerged as a transformative force in education. XR offers immersive learning experiences that enhance engagement, knowledge retention, and real-world application (Ibáñez et al., 2020; Anggara et al., 2021). AR can overlay digital content onto the physical environment, whereas VR creates virtual worlds for various educational disciplines. The potential applications of XR, such as medical simulations and architectural design, extend across numerous fields and contribute to more dynamic and effective learning experiences.

Although interactive technologies are extensively discussed in the literature, the transformative impact of XR on education is often overlooked. Incorporating XR into education could revolutionize classrooms, offering engaging, practical, and interdisciplinary learning opportunities that align with the evolving educational landscape (Hwang, 2022; Kucher, 2022).

Overcoming Challenges and Embracing the Future

The integration of interactive technologies into Kenyan education is accompanied by challenges, ranging from infrastructure gaps to cultural considerations. The roadmap for success involves collaborative efforts among government bodies, educational institutions, and technology providers. Investment in infrastructure and localized content creation, along with holistic teacher-training programs, is vital. Furthermore, a harmonious balance between innovation and cultural sensitivity will ensure that technology resonates with Kenyan values and enhances the education journey.

Interactive technologies offer Kenya a unique opportunity to reimagine education and nurture a generation of empowered, skilled, and adaptable citizens. Kenya can bridge educational gaps, foster creativity, and prepare students for a rapidly evolving world by embracing XR technologies, gamification, interactive learning slides, and CBE models. Through strategic collaboration, investment, and a steadfast commitment to quality education, Kenya can pioneer a transformative educational landscape that stands as a beacon of progress on a global stage (Westera, 2015; Ahmed et al., 2022).

Summary

The integration of interactive technologies into the Kenyan education system has the potential to reshape the way learning is approached. Kenya can propel its education landscape into a more dynamic and skills-oriented future by incorporating extended reality (XR) technologies, game-based learning, interactive learning slides, and competency-based education (CBE).

XR technologies promise to transcend traditional classroom boundaries and provide immersive and active learning experiences. Although challenges such as infrastructure need to be addressed, XR has the potential to significantly enhance critical thinking and problem-solving skills in Kenyan education.

Game-based learning introduces an innovative approach that harnesses students' enthusiasm for technology. Through gamification, Kenya can foster collaboration, curiosity, and practical skills that are vital in the modern job market. Tailored content and thorough teacher training are essential to fully leverage the benefits of game-based learning.

The incorporation of interactive learning slides has the potential to transform teaching methods in Kenya. These tools enable educators to create engaging and participatory classroom environments that nurture critical thinking skills. The successful implementation of interactive tools depends on comprehensive teacher training and seamless integration into pedagogical practice.

Competency-Based Education (CBE) aligns with Kenya's ambition of producing a skilled workforce. By emphasizing skills over rote memorization, CBE can equip graduates with practical abilities that the contemporary job market demands. To effectively roll out CBE, it is crucial to design curricula, provide teacher training, and deliver personalized learning experiences.

Integrating interactive technologies comes with challenges that require collaborative efforts and investments in infrastructure and localized content. Striking a balance between innovation and cultural relevance will ensure that technology resonates with Kenya's values while enhancing the education system.

Conclusion

In conclusion, integrating interactive technologies offers Kenya an opportunity to redefine its educational approach. With thoughtful planning, investment, and commitment to quality education, Kenya can equip its students with the skills, adaptability, and creativity needed to thrive in a rapidly changing world. By embracing these technologies, Kenya has the potential to stand out as a beacon of educational progress globally.

Top of Form

This review underscores the intricate synergy among technology, interactive learning approaches, and evolving curricular models. The convergence of XR technologies, game-based learning, interactive slides, and CBE models paints a dynamic canvas for crafting immersive educational experiences. Successful integration demands overcoming technical obstacles, providing proper training, and aligning pedagogical aims. As education adapts to the digital age, educators are pivotal in equipping learners with skills essential for an ever-changing future. This review reveals a landscape marked by engagement, creativity, and empowerment, urging educators to seize the transformative possibilities and shape the learning future.

Recommendations

Based on the conclusions drawn from the review, there are some recommendations that the Kenyan government can implement to harness the transformative potential of interactive technologies to redefine its approach to education, empower learners, and position itself as a leader in educational innovation on a global stage:

1. The Kenyan Government should prioritize infrastructure investment to support interactive technologies integration in educational institutions. This includes ensuring access to reliable Internet connectivity, appropriate hardware such as computers and mobile devices, and software platforms such as VoiceThread. Additionally, educators should be provided with comprehensive training programs to equip them with the necessary skills and knowledge to effectively utilize these technologies in teaching and learning.
2. Collaboration among government agencies, educational institutions, technology companies, and other stakeholders should be encouraged to foster innovation in educational technology through various partnerships. By fostering a culture of innovation and collaboration, Kenya can leverage the expertise and resources of various stakeholders to drive its educational progress.
5. Emphasize the importance of pedagogical integration and curriculum development to ensure that interactive technologies effectively enhance learning outcomes. By encouraging the development of interdisciplinary and project-based learning experiences that leverage these technologies to engage students, foster creativity, and develop critical thinking and problem-solving skills aligned with 21st-century competencies.

References

- Açıkgöz , T., & Babadoğan, M. C. . (2021). Competency-Based Education: Theory and Practice. *Psycho-Educational Research Reviews*, 10(3), 67–95. https://doi.org/10.52963/PERR_Biruni_V10.N3.06
- Ahmed, M., Hayat, R., Ahmad, M., Kheir, A., Shaheen, F. A., Raza, M. A., & Ahmad, S. (2022). Impact of climate change on dryland agricultural systems: A review of current status, potentials, and further work need. *International Journal of Plant Production*, 16, 341-363. <https://doi.org/10.1007/s42106-022-00197-1>
- Akala, B. M. (2021). Revisiting education reform in Kenya: A case of Competency Based Curriculum (CBC). *Social Sciences & Humanities Open*, 3, (1). <https://doi.org/10.1016/j.ssaho.2021.100107>
- Akinrinola, F. Ogegbo, A., Abimbola, E., & Adewusi, A.G. (2020). Competency-based education in Africa: Exploring teachers' perceptions, understanding, and practices. *Teacher Education through Flexible Learning in Africa (TETFLE)*, 2(1). <https://doi.org/10.35293/tetfle.v2i1.86>
- Alkhayat, L., Ernest, J. & LaChenaye, J. Exploring Kuwaiti Preservice Early Childhood Teachers' Beliefs About Using Web 2.0 Technologies. *Early Childhood Educa-*

- tion Journal*, 48, 715–725. <https://doi.org/10.1007/s10643-020-01036-6>
- Anggara, R. P., Musa, P., Lestari, S., & Widodo, S. (2021). Application of electronic learning by utilizing virtual reality (VR) and augmented reality (AR) methods in natural sciences subjects (IPA) in elementary school students grade 3. *Journal Teknologi Pendidikan [Journal of Educational Technology]*, 23(1), 58-69. <https://doi.org/10.21009/jtp.v23i1.20203>
- Bates, A.W. (2019). *Teaching in a Digital Age – Second Edition*. Tony Bates Associates Ltd. <https://pressbooks.bccampus.ca/teachinginadigitalagev2/>
- Boz, C., & Dinç, M. (2023). Examination of game addiction studies conducted in Turkey: A systematic review study. *Frontiers in psychiatry*, 14, 1014621. <https://doi.org/10.3389/fpsy.2023.1014621>
- Bugawa, A. M. & Mirzal, A. (2018). The Impact of Web 2.0 Technologies on the Learning Experience of Students in Higher Education: *A Review*. *International Journal of Web-Based Learning and Teaching Technologies (IJWLTT)*, 13(3), 1-17. <http://doi.org/10.4018/IJWLTT.2018070101>
- Carstens, K.J., Mallon, J.M., Bataineh, M., & Al-Bataineh, A. (2021). Effects of technology on student learning. *The Turkish Online Journal of Educational Technology*, 20(1), 105-113.
- Chang, C-Y., Lai, C-L., & Hwang, G-J. (2018) Trends and research issues of mobile learning studies in nursing education: A review of academic publications from 1971 to 2016. *Computers & Education*, 116, 28- 48. <https://doi.org/10.1016/j.compedu.2017.09.001>
- Chen, H., Liu, J.-H., & Shou, W.-C. (2018). How competition in a game-based science learning environment influences students' learning achievement, flow experience, and learning behavioral patterns. *Journal of Educational Technology & Society*, 21(2), 164–176.
- Empak, J. (2018, May 31). What is Augmented Reality? <https://www.livescience.com/34843-augmented-reality.html>
- Fraillon, J., Ainley, J., Schulz, W., Friedman, T., & Duckworth, D. (2020). *Preparing for life in a Digital World: IEA International Computer and Information Literacy Study 2018 International Report*. International Association for the Evaluation of Educational Achievement (IEA). <https://www.iea.nl/sites/default/files/2020-04>
- Grace, L. (2019). *Doing things with games: Social impact through play*. Routledge.
- Hussein, M. H., Ow, S. H., Cheong, L. S., Thong, M. -K., & Ebrahim, N.A. (2019). Effects of digital game-based learning on elementary science learning: A systematic review. *IEEE Access*, 7, 62465-62478, <https://doi.org/10.1109/ACCESS.2019.2916324>
- Hwang, G. J. & Chen, P-Y. (2022). Interweaving gaming and educational technologies: Clustering and forecasting the trends of game-based learning research by bibliometric and visual analysis. *Entertainment Computing*, 40, 100459. <https://doi.org/10.1016/j.entcom.2021.100459>
- Ibáñez, M. B., Portillo, A. U., Cabada, R. Z., & Barrón, M. L. (2020). Impact of augmented reality technology on academic achievement and motivation of students from public and private Mexican schools. A case study in a middle-school geometry course. *Computers and Education*, 145, 103734. <https://doi.org/10.1016/j.compedu.2019.103734>

- Kairu, C. (2021). Augmented Reality and Its Influence on Cognitive Thinking in Learning. *American Journal of Educational Research*, 9(8), 504-512.
- Khan, T., Johnston, K., & Ophoff, J. (2019). The impact of an augmented reality application on learning motivation of students. *Advances in Human Computer Interaction*, 7208494. <https://doi.org/10.1155/2019/7208494>
- Kucher, T. (2022). Principles and best practices of designing digital game-based learning environments. *International Journal of Technology in Education and Science (IJTES)*, 5(2), 213-223.
- Mackatiani, C.I., Nungu, M. & Komo, G.D. (2018). Learning Achievement: Illusions of Teacher-Centered Approaches in Primary Schools in Kenya. *Journal of Education and Practice*, 9 (18), 46-54).
- Maina, G., & Waga R. Digital Literacy Enhancement Status in Kenya's Competency-Based Curriculum. 1st International Conference on Sustainable ICT, Education, and Learning (SUZA), Apr 2019, Zanzibar, Tanzania. (pp. 206-217). <https://inria.hal.science/hal-02515752>
- Marcus, J. (2020). How technology is changing the future of higher education. <https://www.nytimes.com/2020/02/20/education/learning/education-technology.html?searchResultPosition=6>.
- Martinez-Lopez, R. Y.-D. (2020). Analysis of the internet use and students' Web 2.0 digital competence in a Russian university. *International Journal of Technology Enhanced Learning*, 12(3), 316-342. <https://doi.org/10.1504/IJTEL.2020.107986>.
- Marto, A., & Gonçalves, A. (2022). Augmented reality games and presence: A systematic review. *Journal of Imaging*, 8(4), 91. <https://doi.org/10.3390/jimaging8040091>
- Mundy, M.A., Hernandez, J. & Green, m. (2019). Perceptions of the effects of Augmented Reality in the Classroom. *Journal of Instructional Pedagogies*, 15, 1-15. <https://files.eric.ed.gov/fulltext/EJ1216828.pdf>
- Murithi, J., Yoo, J.E. Teachers' use of ICT in implementing the competency-based curriculum in Kenyan public primary schools. *Innovation and Education*, 3, 5 (2021). <https://doi.org/10.1186/s42862-021-00012-0>
- Mwarari, D.C., Githui, P. & Mwenje, M. (2020). Parental involvement in the implementation of competency based curriculum in Kenya: Perceived challenges and opportunities. *American Journal of Humanities and Social Sciences Research (AJHSSR)*, 4(3), 201-208.
- Ningsih, D. N., & Firmansyah, A. (2020). Pemanfaatan virtual reality pada pembelajaran menulis teks tanggapan. *Prosiding Samasta*. <https://jurnal.umj.ac.id/index.php/SAMASTA/article/view/7144>
- OECD. (2018). *The Future of Education and Skills Education 2030*. [https://www.oecd.org/education/2030_project/contact/E2030_Position_Paper_\(05.04.2018\).pdf](https://www.oecd.org/education/2030_project/contact/E2030_Position_Paper_(05.04.2018).pdf)
- Ordu, U.B.-A. (2021). The role of teaching and learning aids/methods in a changing world. *New Challenges to Education: Lessons from around the World Bulgarian Comparative Education Society*, 19 (pp. 210–216). BCES Conference Books. Sofia. <https://files.eric.ed.gov/fulltext/ED613989.pdf>

- Özdemir, M., Şahin, C., Serdar, A., & Demir, M.K. (2018). The effect of augmented reality applications in the learning process: a meta-analysis study. *Eurasian Journal of Educational Research (EJER)*, 74, 165-186.
- Pomerantz, J. & Rode, R. (2020). Exploring the future of extended reality in higher education, *EDUCAUSE Review*. <https://er.educause.edu/articles/2020/6/exploring-the-future-of-extended-reality-in-higher-education>
- Wedyan, M., Falah, J., Elshaweesh, O., Alfalah, S. F. M., & Alazab, M. (2022). Augmented reality-based english language learning: Importance and state of the art. *Electronics*, 11(17). <https://doi.org/10.3390/electronics11172692>
- Westera, W. (2015). Reframing the role of educational media technologies. *Quarterly Review of Distance Education*, 16(2), 19–32
- Yapıcı, İ. Ü. & Karakoyun, F. (2021). Using augmented reality in biology teaching. *Malaysian Online Journal of Educational Technology*, 9(3), 40-51. <http://dx.doi.org/10.52380/mojet.2021.9.3.286>
- Zhao, Y., Lu, J., Woodcock, S., & Ren, Y. (2022). Social media web 2.0 tools adoption in language and literacy development in early years: A scoping review. *Children (Basel, Switzerland)*, 9(12), 1901. <https://doi.org/10.3390/children9121901>