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“Optimizing Innovation in Knowledge, Education and Design”

EXTENDED ABSTRACT



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Assalamualaikum warahmatullahi wabarakatuh,



First and foremost, I would like to express my gratitude to the organizing committee of i-Spike 2023 for their tremendous efforts in bringing this online competition a reality. I must extend my congratulations to the committee for successfully delivering on their promise to make i-Spike 2023 a meaningful event for academics worldwide.

The theme for this event, 'Optimizing Innovation in Knowledge, Education, and Design,' is both timely and highly relevant in today's world, especially at the tertiary level. Innovation plays a central role in our daily lives, offering new solutions for products, processes, and services. By adopting a strategic approach to 'Optimizing Innovation in Knowledge, Education, and Design,' we have the potential to enhance support for learners and educators, while also expanding opportunities for learner engagement, interactivity, and access to education.

I am awed by the magnitude and multitude of participants in this competition. I am also confident that all the innovations presented have provided valuable insights into the significance of innovative and advanced teaching materials in promoting sustainable development for the betterment of teaching and learning. Hopefully, this will mark the beginning of a long series of i-Spike events in the future.

It is also my hope that you find i-Spike 2023 to be an excellent platform for learning, sharing, and collaboration. Once again, I want to thank all the committee members of i-Spike 2023 for their hard work in making this event a reality. I would also like to extend my congratulations to all the winners, and I hope that each of you will successfully achieve your intended goals through your participation in this competition.

Professor Dr. Roshima Haji Said
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WELCOME MESSAGE (i-SPIKE 2023 CHAIR)



We are looking forward to welcoming you to the 3rd International Exhibition & Symposium on Productivity, Innovation, Knowledge, and Education 2023 (i-SPIKE 2023). Your presence here is a clear, crystal-clear testimony to the importance you place on the research and innovation arena. The theme of this year's Innovation is "*Optimizing Innovation in Knowledge, Education, & Design*". We believe that the presentations by the distinguished innovators will contribute immensely to a deeper understanding of the current issues in relation to the theme.

i-SPIKE 2023 offers a platform for nurturing the next generation of innovators and fostering cutting-edge innovations at the crossroads of collaboration, creativity, and enthusiasm. We enthusiastically welcome junior and young inventors from schools and universities, as well as local and foreign academicians and industry professionals, to showcase their innovative products and engage in knowledge sharing. All submissions have been rigorously evaluated by expert juries comprising professionals from both industry and academia.

On behalf of the conference organisers, I would like to extend our sincere thanks for your participation, and we hope you enjoy the event. A special note of appreciation goes out to all the committee members of i-SPIKE 2023; your dedication and hard work are greatly appreciated.

Dr. Junaida Ismail

Chair

3rd International Exhibition & Symposium Productivity, Innovation, Knowledge, and Education 2023 (i-SPIKE 2023)

EDUxic FOR DYSLExIC: A FRAMEWORK FOR TEACHING AIDS

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ABSTRACT

In order to meet the special needs of intermediate-level learners in years 3-6 (between the ages of 9 and 12), the EDUxic project presents a novel framework that combines design features with a focus on dyslexic children. The "ED" refers to a design element and "DU" stands for education, while "xic" represents dyslexic children and their comprehension of reading in Malay language. The EDUxic framework aims to boost dyslexic children's learning experiences through the use of specific teaching materials. The project adopts a comprehensive approach, combining qualitative interviews with 5 experts and quantitative analysis using the Fuzzy Delphi Method. Experts from product design, dyslexia expertise, dyslexia teaching, occupational therapy, and speech-language therapy contribute their insights. The findings highlight the EDUxic model's societal benefits, allowing product designers and product design lecturers to create more effective teaching aids. Implementing the EDUxic paradigm benefits dyslexia teachers, speech-language therapists, and occupational therapists by improving language skills and learning ability. With access to customized teaching aids, dyslexic children have a more targeted and engaging learning experience, resulting in improved educational outcomes. The EDUxic framework highlights the need for creative learning strategies in helping students with disabilities through alignment with the SDGs, encouraging diversity, and empowering dyslexic children.

Keywords: EDUxic, framework, dyslexic children, teaching aids, special needs

INTRODUCTION: WHAT IS EDUxic?

EDUxic is an innovative framework designed to address the special learning needs of dyslexic children at the intermediate level, with a focus on improving reading skills in Malay. Its primary goal is to serve as a guide and source of inspiration for product design lecturers, designers, dyslexia teachers, practitioners, and parents, allowing them to create practical reading products or teaching aids.

EDUxic is a framework that combines design ("ED") and education ("DU") elements in a novel approach to solve the issues associated with dyslexia. The term "ED" is purposefully spelled reversed as "DE" to represent design and its relationship to dyslexia. The "DU" component reflects education, with a specific focus on enhancing reading comprehension skills in Malay language. To meet the learning demands of dyslexic children at the intermediate level, it uses a multimodal approach and repetition strategies. The word "xic" in the name EDUxic refers to the framework's intended target group, which is dyslexic children at the intermediate level. The EDUxic framework is especially valuable for product designers, teachers, therapists, and parents since it guides them in developing effective teaching aids for students in years 3-6, who are typically between the ages of 9 and 12.

The initiative aligns with the objectives outlined in the Malaysian Education Blueprint 2013-2025, which aims to ensure that children with special needs receive equitable benefits throughout the Malaysian educational system (Ministry of Education, 2013).

The EDUxic Model combines two important disciplines, design, and education, to address the needs of intermediate-level dyslexic students. The framework includes a series of objectives aimed at achieving the intended results, which include the development of teaching aids to address the educational needs of dyslexic children themselves. Furthermore, the EDUxic framework contains a number of components, including learning strategy, design strategy, learning and teaching tools, fun and enjoyable learning experiences, and capture attraction aspects.

WHY EDUxic?

The EDUxic project addresses the pressing need to support dyslexic children in their educational journey by offering a personalized learning experience through innovative teaching aids. Dyslexia is a learning disorder that affects reading, writing, and spelling abilities, presenting unique challenges for children in their academic pursuits (Roitsch & Watson, 2019). It is crucial to provide effective interventions and tools that cater to the specific needs of dyslexic learners to ensure their educational success and overall well-being (Matejko et al., 2023; Kizir & Şahin, 2020).

This research project aims to present the EDUxic framework as a dependable and transparent framework for product designers, educators, and therapists. The EDUxic model is aimed to address the unique requirements of dyslexic children by incorporating the skills of multiple professions such as product design experts, dyslexia experts, dyslexia teachers, occupational therapists, and speech-language therapists. The framework efforts to overcome

gaps in education, promote diversity and empower dyslexic learners in their educational path through collaborative efforts and interdisciplinary approaches.

The EDUxic framework's implementation matches with global government initiatives, particularly those helped by the Ministry of Education (MOE), in supporting inclusive and equitable education (Ministry of Education, 2013). According to *The Dakar Framework for Action* (2000) the need of providing equal opportunity for all children, regardless of learning difficulties, and work hard to build educational environments that meet their various needs.

Furthermore, the EDUxic model aligns with the Sustainable Development Goals (SDGs) of the United Nations, particularly SDG 4 (Quality Education) and SDG 10 (Reduced Inequalities) (Department of Statistics, 2019). SDG 4 aims to provide inclusive and equitable quality education for all, emphasizing the need to promote lifelong learning opportunities.

The EDUxic framework contributes to this goal by emphasizing inclusivity and tailoring teaching aids to the specific needs of dyslexic children, ensuring they have equal access to high-quality education (Rahul & Ponniah, 2021). Additionally, the model supports SDG 10, which focuses on reducing inequalities within and among nations. By narrowing educational disparities through personalized learning tools, the EDUxic framework promotes social inclusion and empowers dyslexic learners (Abu Bakar et al., 2023), aligning with the objectives of SDG 10. The alignment with global sustainability goals further strengthens the commercialization potential of the EDUxic framework, as governments worldwide strive to achieve these goals.

In academia, the EDUxic framework presents significant commercialization potential. Product designers and lecturers can utilize the transparent and dependable framework offered by the framework to develop innovative teaching aids that cater specifically to dyslexic learners. This opens up new market opportunities in the special education industry, as the EDUxic framework encourages creativity and innovation among designers, leading to the development of more effective learning tools (Elsbach & Stigliani, 2018). Academia and industry stakeholders may work together to bring the EDUxic framework into reality, creating a symbiotic partnership between research and the development of products.

The EDUxic framework holds commercialization potential within the community, benefiting various stakeholders involved in the education and support of dyslexic children. Dyslexia teachers, speech-language therapists, and occupational therapists can integrate the model into their practices, enhancing the effectiveness of therapy sessions and improving language skills and learning capacity in dyslexic children. The EDUxic framework provides them with additional tools and resources to support their interventions, leading to more positive outcomes for the children they work with.

Moreover, parents of dyslexic children can access learning tools that are specifically tailored to their child's learning style, making the educational process more enjoyable and fruitful (Abd Rauf et al., 2018). The EDUxic framework empowers the community by providing personalized learning solutions that cater to the diverse needs of dyslexic learners, ultimately

leading to improved educational outcomes (Denton et al., 2021).

HOW THE EDUxic IS DEVELOPED?

The EDUxic framework is based on Vygotsky's sociocultural theory of cognitive development, and it is paired with the product experience framework. It is a pioneering venture that combines the disciplines of design and education. The EDUxic framework's significant goal is to serve as a thorough guide for creating teaching aids aimed at enhancing fluent reading skills in the Malay language among dyslexic children at the intermediate level.

The EDUxic framework is divided into three distinct phases: 1) needs analysis, 2) design and development, and 3) usability evaluation, where user feedback is collected and analyzed.

The first stage of analyzing the needs for this framework entails bringing in experts from a variety of fields, such as design, child development in dyslexia, and education professionals that specialized in dyslexic children. The main goal of this requirement phase isto explore the need for framework creation, identify impediments and challenges, make recommendations, and define the relationship between design and education.

Furthermore, a thorough review of the previous research was carried out to identifythe need for a framework that targets dyslexic children at the intermediate learning level, witha particular emphasis on the use of the Malay language.

Each main component is evaluated, reviewed, and verified by a broad panel of 20 experts during the second phase, which comprises the design and development of the EDUxic framework. The Fuzzy Delphi Technique (FDM) is used for this. The EDUxic framework employs the expertise of the same individual during the development phase to assess, validate, and rank every element contained inside it. The findings of this consensus among experts are used to build a prototype for the EDUxic framework.

Researchers must prioritize individuals with the appropriate skills when selecting these experts, as stated in previous studies (Mohd Jamil et al., 2018; Mustapha & Darusalam, 2018; Siraj et al., 2020). The term "expert" refers to people who have received training and have knowledge in a given profession, making them dependable sources of information (Creswell & Creswell, 2018). Furthermore, an expert is often described as someone who has substantial knowledge and has been directly involved in the same sector for at least five years (Yazdanmehr & Akbari, 2015; Berliner, 2004).

The final phase, which marks the conclusion of the EDUxic framework, entails engaging users to evaluate its usability. The developmental process of the EDUxic framework is depicted in the illustrated diagram labeled as Figure 1.

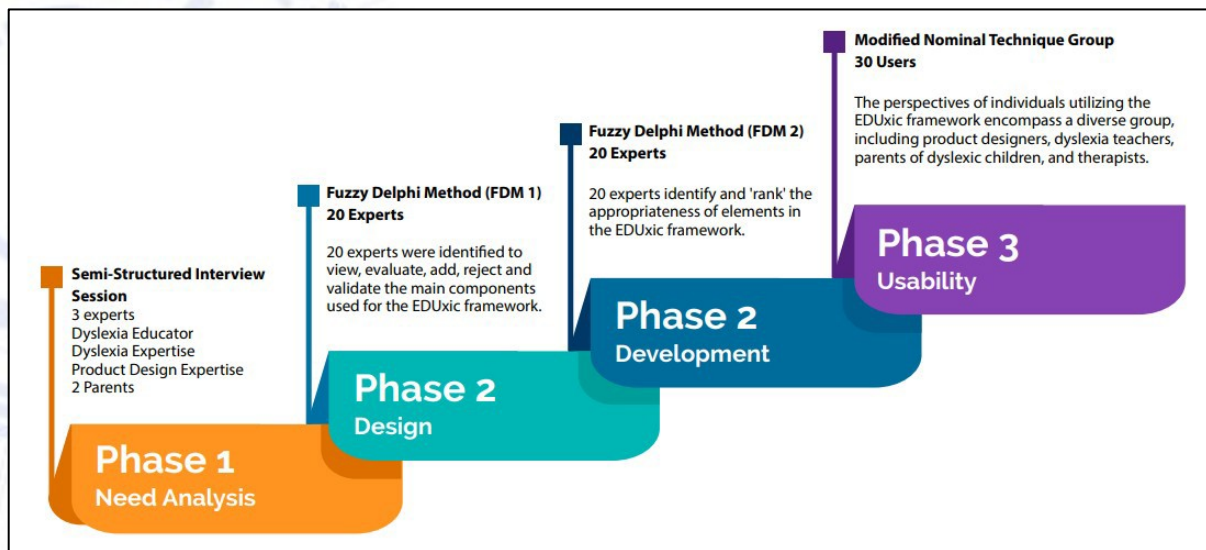


Figure 1 The developmental process of the EDUx framework

Parents expressed their gratitude for the EDUx framework's clear aims and their opinion that it will assist designers in designing meaningful teaching tools. In general, users regarded the framework to be distinct, all-encompassing, and extremely beneficial in providing support for dyslexic children's learning.

CONCLUSION

The EDUx framework offers a comprehensive and innovative solution for addressing the specific learning needs of dyslexic children at the intermediate level. By combining the disciplines of design and education, the framework provides a guideline for creating effective teaching aids that enhance fluent reading skills in the Malay language. The development of the EDUx framework involved input from experts in various fields, ensuring its credibility and relevance.

In conclusion, the EDUx framework stands as a valuable resource for enhancing the education and support of dyslexic children. Its interdisciplinary approach, user-centric design, and alignment with educational and sustainability goals make it a significant contribution to the field. By utilizing the framework, stakeholders can work collaboratively to create a more inclusive and empowering educational environment for dyslexic learners, ultimately leading to improved educational outcomes and a brighter future for all.

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REFERENCES

- Abd Rauf, A. A., Ismail, M. A., Balakrishnan, V., & Haruna, K. (2018). Dyslexic Children: The Need for Parents Awareness. *Journal of Education and Human Development*, 7(2), 91–99. <https://doi.org/10.15640/jehd.v7n2a12>
- Abu Bakar, N. A., ChePa, N., & Sie-Yi, L. L. (2023). Criteria for the Dyslexic Games: A Systematic Literature Review. *Journal of Human Centered Technology*, 2(1), 32–42. <https://doi.org/10.11113/humentech.v2n1.35>
- Berliner, D. C. (2004). Expert teachers : Their characteristics ,. *De La Teoria. a L'Aula*, July, 13–27.
- Creswell, J. W., & Creswell, J. D. (2018). *Research design: qualitative, quantitative, and mixed methods approach. Fifth edition. Los Angeles : SAGE* (5th ed.). SAGE Publications.
- Denton, C. A., Montroy, J. J., Zucker, T. A., & Cannon, G. (2021). Designing an Intervention in Reading and Self-Regulation for Students With Significant Reading Difficulties, Including Dyslexia. *Learning Disability Quarterly*, 44(3), 170–182. <https://doi.org/10.1177/0731948719899479>
- Department of Statistics, M. (2019). *Sustainable Development Goals (SDG) Indicators Malaysia 2018*.
- Elsbach, K. D., & Stigliani, I. (2018). Design Thinking and Organizational Culture: A Review and Framework for Future Research. *Journal of Management*, 44(6), 2274–2306. <https://doi.org/10.1177/0149206317744252>
- Jamali, S. N., Admodisastro, N., Kamaruddin, A., Ghani, A. A. A., & Hassan, S. (2019). Design guidelines of tangible interaction learning model for children with dyslexia. *International Journal of Advanced Science and Technology*, 28(2), 355–362.
- Kizir, M., & Şahin, C. H. (2020). Elementary School Teachers' Experiences Regarding the Prerefferal Process. *European Journal of Special Education Research*, 6(2), 110–129. <https://doi.org/10.46827/ejse.v6i2.3254>
- Matejko, A. A., Lozano, M., Schlosberg, N., McKay, C., Core, L., Revsine, C., Davis, S. N., & Eden, G. F. (2023). The relationship between phonological processing and arithmetic in children with learning disabilities. *Developmental Science*, 26(2), 1–14. <https://doi.org/10.1111/desc.13294>
- Ministry of Education. (2013). Malaysia Education Blueprint 2013 - 2025. *Education*, 27(1), 1–268. <https://doi.org/10.1016/j.tate.2010.08.007>
- Mohd Jamil, M. R., Siraj, S., Hussin, Z., Mat Nor, N., & Sapar, A. A. (2018). Pengenalan Asas Kaedah Fuzzy Delphi Dalam Penyelidikan Rekabentuk Pembangunan. In *Minda Intelek* (3rd ed.). Minda Intelek. <https://www.researchgate.net/publication/299510278>

Mustapha, R., & Darusalam, G. (2018). *Aplikasi Kaedah Fuzzy Delphi Dalam Penyelidikan Sains Sosial*. Universiti Malaya.

Rahul, D. R., & Ponniah, R. J. (2021). Educational Insights into Dyslexia. *Rupkatha Journal on Interdisciplinary Studies in Humanities*, 13(4), 1–12.
<https://doi.org/10.21659/RUPKATHA.V13N4.35>

Roitsch, J., & Watson, S. (2019). An Overview of Dyslexia: Definition, Characteristics, Assessment, Identification, and Intervention. *Science Journal of Education*, 7(4), 81.
<https://doi.org/10.11648/j.sjedu.20190704.11>

Siraj, S., Abdullah, M. R. T. L., Muhamad, R., & Rozkee. (2020). *Pendekatan penyelidikan reka bentuk dan pembangunan: Aplikasi kepada penyelidikan pendidikan*. Penerbit Universiti Pendidikan Sultan Idris.

The Dakar Framework for Action (Issue April). (2000).
<http://unesdoc.unesco.org/images/0012/001211/121147e.pdf>

Yazdanmehr, E., & Akbari, R. (2015). Language Teaching Research An expert EFL teacher ' s class management. *Iranian Journal of Language Teaching Research*, 3(July), 1–13.
www.urmia.ac.ir/ijltr Iranian

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