

Digital Empowerment: A Comparative Study of Educational Resource Platform Construction in Ireland and Malaysia

Yang Lei

(Yanshan College Shandong University of Finance and Economics, Postal Address: Laiwu District, Jinan, Shandong, China)

Author's introduction: Yang Lei (1993-), female, master, lecturer of Yanshan College Shandong University of Finance and Economics, main research direction: foreign language education, teacher professional development.

Postal Address: Laiwu District, Jinan, Shandong, China

Abstract: - This paper aims to explore the implementation strategies, effectiveness and challenges of digital education in different countries by comparing and analyzing the National Resource Centre (NRC) in Ireland and the DELIMA platform in Malaysia. Based on the theory of comparative education, this paper conducts an in-depth analysis of the design and implementation strategies of the National Resource Centre (NRC) in Ireland and the DELIMA platform in Malaysia, aiming to reveal the similarities and differences of the two platforms in different cultural, policy and educational backgrounds, and how they affect the quality and equity of education. The study found that while NRC and DELIMA have made positive progress in improving the quality and equity of education, they also face challenges such as resource renewal, user engagement and network infrastructure. This study sheds light on digital education practices around the world, particularly in how to overcome technological challenges, promote educational equity and achieve sustainable development of education.

Keywords: - digital education, National Resource Centre, Ireland, DELIMA, Malaysia.

1. Introduction

With the rapid development of information technology, digital education has become an important issue in the field of global education. It not only changes the traditional way of teaching and learning, but also provides new ways to improve the quality of education and promote the equity of education (Bower & Hedberg, 2005; Bower, 2018; Luckin & Boulay, 1999; Luckin et al., 2006; Means et al., 2010; Means et al., 2011; Warschauer, 2003; Warschauer, 2011). At the heart of digital education is the use of digital technologies, such as the Internet, artificial intelligence and virtual reality, to enhance the accessibility of educational resources and the interactivity of teaching and learning (Cuban, 2001; Ouyang & Jiao, 2021; Villena-Taranilla et al., 2022). However, despite the enormous potential of digital education, its implementation also faces a number of challenges, including technology acceptance,

Educational equity and policy support (Dong, 2024; Jackman et al., 2021; Schleicher, 2024; Tawil & Miao, 2024; Wu et al., 2024; Warschauer & Matuchniak, 2010).

This paper aims to explore the implementation strategies, effectiveness and challenges of digital education in different national contexts through a comparative analysis of the cases of the National Resource Centre (NRC) in Ireland and the DELIMA platform in Malaysia. As an open educational Resource platform, the NRC is committed to providing diverse educational resources and professional development programs to support teaching and learning in the field of higher education (National Resource Hub, 2023; Risquez et al., 2020). The DELIMA platform focuses on enhancing the engagement and learning outcomes of students in

basic education through personalized learning strategies (DELIMa, 2023).

2. Significance of the Study

The purpose and significance of this study is to reveal the similarities and differences in the design, implementation and sustainable development of these two platforms, and how they affect the quality and equity of education. This comparative analysis is expected to shed light on digital education practices on a global scale, especially in terms of how to overcome technological challenges, promote educational equity and achieve sustainable development of education.

3. Literature Review

As an emerging education model, digital education has received worldwide attention in recent years. According to Bower (2018), digital education enhances the teaching and learning process by integrating information technology with teaching practices, aiming to improve the accessibility, personalization and efficiency of education. Research in this area covers everything from technology acceptance (Antonietti & Amenduni, 2022; Davis, 1989; Scherer & Teo, 2019; Tondeur et al., 2008) to educational equity (Bergdahl, 2020; OECD, 2023; van de Werfhorst et al., 2022; Warschauer & Matuchniak, 2010) in multiple dimensions, including technology integration (Li et al., 2023), learning theory (Bandura, 1986; Guay et al., 2008; Jonassen, 1999; Ryan & Deci, 2000), education policy (UNESCO, 2023), and socio-economic impacts (Cuban, 2001; OECD, 2023).

In terms of technology acceptance, the Technology Acceptance Model (TAM) proposed by Davis (1989) highlights users' perceived usefulness and ease of use of technology as key factors influencing technology adoption. This model provides a theoretical basis for understanding user engagement in NRC and DELIMa platforms. For example, NRC can enhance the perceived usefulness of users by offering diverse resources and professional development courses. TPACK (Ertmer et al., 2012; Harris & Hofer, 2011; Koehler & Mishra, 2009; Mishra & Koehler, 2006; Voogt & Roblin, 2012) emphasizes the ability of

teachers to integrate technology in instructional design, which is crucial for the successful implementation of NRC and DELIMa platforms (Mishra & Koehler, 2006). These platforms support teachers to innovate in their teaching practices by providing a wealth of digital resources and tools.

Educational equity is another important issue in the field of digital education. Warschauer & Matuchniak (2010) noted that while technology has the potential to narrow the education gap, it can also exacerbate inequality. The implementation of the DELIMa platform in Malaysia, especially its application in rural areas, aims to promote educational equity through personalized learning strategies (DELIMa, 2023). However, inequalities in network infrastructure can be an obstacle to achieving this goal.

The application of learning theory in digital education has also received widespread attention. Constructivist learning theory holds that learning is the process of constructing knowledge through interaction and reflection with the environment (Vygotsky, 1978). The personalized learning strategy of DELIMa platform is based on this theory, aiming to promote active learning among students through interactive and adaptive learning paths (DELIMa, 2023). In addition, the Self Determination Theory (SDT) emphasizes the role of autonomy, competence and relevance in learning motivation (Deci & Ryan, 2000). This is in line with the personalised professional development curriculum offered by the NRC, which aims to enhance the autonomy and professional growth of teacher's (National Resource Hub, 2023).

In addition, education policy plays a key role in promoting the development of digital education. Cuban (2001) noted that policymakers need to consider how to combine technology with educational goals and practices. The establishment and implementation of the NRC and DELIMa platforms reflect the commitment to modernizing education at the policy level, while also facing challenges in policy implementation and sustained support (National Resource Hub, 2023; DELIMa,

2023). Regarding the sustainable development and maintenance of digital education platforms, Bower (2018) highlighted the importance of policy support and continuous investment, which echoes the challenges faced by the NRC and DELIMa platforms to ensure the continued renewal of resources and the long-term sustainability of platforms.

Socio-economic factors have a significant impact on the accessibility and effectiveness of digital education. The study by Warschauer & Matuchniak (2010) highlights the problem of the digital divide, where unequal distribution of technological resources can lead to unequal educational opportunities. The implementation of the DELIMa platform in Malaysia, particularly in rural areas, aims to bridge this gap through technological means (DELIMa, 2023). However, the restrictions of network infrastructure and equipment remain obstacles to achieving educational equity.

4. Case Analysis

4.1 Case Overview

The National Resource Centre for Ireland (NRC) was established in 2019 by the National Forum for Improving the Quality of Teaching and Learning in Higher Education in Ireland, with the aim of serving as a gateway for open education resources (OERs) and practices in the field of higher education. The core goal of NRC is to promote diversity and inclusivity in education by providing high-quality educational resources, while supporting the professional development of educators. In terms of design and implementation, the NRC platform gathers rich educational resources, including online courses, toolkits, policy guidelines, etc., covering multiple disciplinary fields. The design of the platform focuses on user feedback, ensuring the relevance and quality of resources. In addition, NRC also offers professional development courses to help educators improve their teaching skills through online seminars and training activities. Currently, the NRC has achieved significant results in improving the accessibility and diversity of educational resources, supporting the needs of educators and learners. However, the challenges faced by the platform include how to continuously attract user

participation, as well as how to ensure the continuous updating and relevance of resources to adapt to the constantly changing educational needs. (National Resource Hub, 2023)

The DELIMa platform was established by the Malaysian Ministry of Education in 2019, focusing on improving the quality of basic education through digital teaching and learning. DELIMa's goal is to enhance students' engagement, motivation, and outcomes through personalized learning strategies, while promoting the professional growth of teachers. In terms of design and implementation, the DELIMa platform provides a series of educational resources, including interactive courses, video tutorials, and virtual classrooms, supporting students' self-directed learning and teachers' teaching innovation. The platform also places special emphasis on teacher training, helping teacher's master digital teaching tools such as simulation laboratories and augmented reality technologies through seminars and online courses. At present, DELIMa has achieved positive results in enhancing students' engagement and motivation in learning, especially in rural areas, which helps to narrow the education gap between urban and rural areas. However, the platform also encountered challenges in the implementation process, such as ensuring the popularization and stability of network infrastructure, and how to continuously update content to meet the needs of educational development. (DELIMa, 2023)

4.2 The Comparison of Design Strategies

In terms of design strategy, both the Irish National Resource Centre (NRC) and the Malaysian DELIMa platform both demonstrate a deep understanding of user needs and a commitment to educational equity. The NRC emphasizes the openness and sharing of educational resources by providing diversified resources and professional development courses, aiming to support teachers and learners in the field of higher education). In contrast, the DELIMa platform focuses on the basic education stage, with more emphasis on the application of personalized learning and interactive technology, aiming to improve students' learning participation and motivation. Both emphasize the integration and innovation of

technology in the design concept, but the application of DELIMA in personalized learning is more prominent.

4.3 The Comparison of Implementation Process

During the implementation process, both NRC and DELIMA face the challenge of effectively promoting the platform and ensuring teacher training. The NRC has facilitated the widespread use of the platform by working closely with higher education institutions, and by providing sustained professional development support. DELIMA has achieved rapid deployment of the platform through cooperation with the Ministry of Education and nationwide promotion in schools. However, DELIMA has encountered more challenges in network infrastructure and teacher training, especially in rural and remote areas.

4.4 The Comparison of Effectiveness Evaluation

From the perspective of effectiveness evaluation, NRC has achieved remarkable results in improving the accessibility of educational resources and promoting teacher professional development. However, user engagement and the sustainability of resource updates are issues that require continuous attention. DELIMA has shown good performance in improving students' learning engagement and motivation, especially in promoting educational equity, but its long-term effectiveness and sustainability still need further observation.

4.5 Discussion

Through comparative analysis, we can see that digital education platforms have great potential in promoting educational equity and improving educational quality. NRC and DELIMA share similarities in design concepts, implementation strategies, and effectiveness evaluations, as well as their respective characteristics. Both platforms are committed to optimizing the allocation of educational resources through innovative design concepts and effective implementation strategies. However, both platforms also face their own challenges during implementation, such as user engagement, resource updates, network infrastructure, and teacher training. These findings

provide valuable experience and inspiration for other countries in designing and implementing similar platforms. Therefore, future research can further explore how to overcome challenges in the implementation process and achieve long-term sustainable development of digital education platforms through policy support, technological innovation, and international cooperation.

5. Suggestions for the Construction of Digital Education Platforms

5.1 Increasing User Engagement

The digital construction of educational platforms should develop incentive mechanisms to encourage users to actively participate in the creation and sharing of platform content, in order to enhance the platform's activity and resource richness. At the same time, educational platforms can design and implement user engagement enhancement plans, collecting data on platform using experience and satisfaction through regular user surveys and feedback mechanisms.

5.2 Enhancing Cultural Adaptability

The design of education platforms should not only incorporate multicultural elements to ensure that educational resources and teaching content are inclusive and attractive to learners from different cultural backgrounds, but also strengthen cooperation with education experts to ensure that platform content and teaching methods are in consistent with local education systems and learning habits.

5.3 Seeking Policy and Resource Support

In the construction and development process of digital education platforms, it is necessary to strengthen cooperation with the government and educational institutions to strive for policy support and financial investment and promote the construction of network infrastructure, especially in remote and resource-poor areas, so as to ensure the sustainable operation and resource updating of the platform.

5.4 Integration of Technological Innovation

The digital construction of educational platforms should continuously track the development trend of technology, and regularly update platform technologies to ensure that they are synchronized with the latest educational technologies and teaching methods. And then explore the application of cutting-edge technologies such as artificial intelligence and machine learning to personalized learning and intelligent recommendation systems, in order to improve learning efficiency and personalized experience.

5.5 Establishing Evaluation and Improvement Mechanism

In the process of digital construction of education platforms, on the one hand, it is necessary to develop and implement an evaluation framework and regularly conduct quantitative and qualitative analysis of the platform's educational effectiveness, in order to adjust and optimize it in a timely manner. On the other hand, a continuous improvement mechanism should be established to continuously optimize platform functionality and content based on evaluation results and user feedback, ensuring its long-term effectiveness and attractiveness.

The above suggestions aim to empower the construction and operation of education platforms with digital technology, to achieve the improvement of user participation, the enhancement of cultural adaptability, the pursuit of policies and resources, the integration of technological innovation, and the establishment of evaluation and improvement mechanisms, thereby promoting the sustainable development of education platforms and improving the quality of education.

6. References

1. Antonietti, C., & Amenduni, F. (2022). Can teachers' digital competence influence technology acceptance in vocational education? *Computers in Human Behavior*, 132, 107266.
2. Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice Hall.

3. Bergdahl, M. (2020). Student Engagement in Open, Distance, and Digital Education. In M. Bergdahl (Ed.), *Open, Distance, and Digital Education* (pp. 79-92). Springer, Singapore.
4. Bower, M., & Hedberg, J. G. (2005). Web-based learning: Pros, cons and issues without discussion. *Journal of Educational Technology Systems*, 33(4), 387-401.
5. Bower, M. (2018). Digital Education: Opportunities and Challenges for Developing Countries. *International Journal of Educational Development*, 61, 58-67.
6. Cuban, L. (2001). *Oversold and Underused: Computers in the Classroom*. Harvard University Press.
7. Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly*, 13(3), 319-340.
8. Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, 11(4), 227-268.
9. DELIMa. The Ministry of Education of Malaysia. Accessed Dec, 15, 2023. <https://d2.delima.edu.my>
10. Dong, C. (2024). Educational Concepts and Methodologies in the AI Era: Challenges and Responses. *Frontiers of Digital Education*, 1(1), 69-77.
11. Ertmer, P. A., Ottenbreit-Leftwich, A. T., Sadik, O., Sendurur, P., & Sendurur, E. (2012). Teacher beliefs and technology integration practices: A critical relationship. *Computers & Education*, 59(2), 423-436.
12. Guay, F., Ratelle, C. F., & Senecal, C. (2008). Optimal learning in the new millennium: The role of self-determination theory. *Canadian Psychology/Psychologie Canadienne*, 49(3), 232-256.
13. Harris, J. B., & Hofer, M. J. (2011). Technological pedagogical content knowledge (TPACK) in action: A descriptive study of secondary teachers' curriculum-based, technology-related instructional planning.

- Journal of Research on Technology in Education, 43(2), 139-168.
14. Jackman, J. A., Gentile, D. A., Cho, N.-J., & Park, Y. (2021). Addressing the digital skills gap for future education. *Nature Human Behaviour*, 5, 542–545.
 15. Jonassen, D. H. (1999). Designing constructivist learning environments. In C. M. Reigeluth (Ed.), *Instructional-design theories and models: A new paradigm of instructional theory* (Vol. II, pp. 49-72). Mahwah, NJ: Lawrence Erlbaum Associates.
 16. Koehler, M. J., & Mishra, P. (2009). What is technological pedagogical content knowledge (TPACK)? *Contemporary Issues in Technology and Teacher Education*, 9(1), 60-70.
 17. Li, Y., Shang, J., & Jiao, L. (2023). Review of China's Online Education Policy, 1999–2022. *ECNU Review of Education*, 6(1), 1-21.
 18. Luckin, R., & du Boulay, B. (1999). Using technology to support learning in the classroom. *Learning and Instruction*, 9(3), 221-237.
 19. Luckin, R., du Boulay, B., & du Boulay, J. (2006). Using technology to support learning in the classroom: A review of the literature. *Learning and Instruction*, 16(6), 509-523.
 20. Means, B., Toyama, Y., Murphy, R., Bakia, M., & Jones, K. (2010). Evaluation of evidence-based practices in online learning: A meta-analysis and review of online learning studies. U.S. Department of Education, Office of Educational Technology. Retrieved from <https://www2.ed.gov/about/offices/list/os/otep/evaltech/finalreport.pdf>
 21. Means, B., & Tyack, D. (2011). Technology and education: What can we learn from the evidence? National Center for Education Statistics, U.S. Department of Education. Retrieved from <https://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2011-0407>
 22. Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record*, 108(6), 1017-1054.
 23. National Resource Hub. The National Forum for Improving the Quality of Teaching and Learning in Higher Education in Ireland. Accessed Dec, 15, 2023. <https://hub.teachingandlearning.ie>
 24. OECD. (2023). Digital equity and inclusion in education: An overview of practice and policy in OECD countries. OECD Education Working Papers, No. 7.
 25. Ouyang, F., & Jiao, P. (2021). Artificial intelligence in education: The three paradigms. *Computers & Education*, 2(2021), 100020.
 26. Riskey, A., McAvinia, C., Desmond, Y., Bruen, C., Ryan, D., & Coughlan, A. (2020). Towards a devolved model of management of OER? The case of the Irish higher education sector. *Research in Learning Technology*, 28.
 27. Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55(1), 68-78.
 28. Scherer, R., & Teo, T. (2019). A meta-analysis of technology acceptance in education: A review of the Technology Acceptance Model (TAM). *Educational Technology Research and Development*, 67(2), 1-35.
 29. Schleicher, A. (2024). Toward the Digital Transformation in Education. *Frontiers of Digital Education*, 1(1), 4-25.
 30. Tawil, S., & Miao, F. (2024). Steering the Digital Transformation of Education: UNESCO's Human-Centered Approach. *Frontiers of Digital Education*, 1(1), 51-58.
 31. Tondeur, J., van Braak, J., Ertmer, P. A., & Ottenbreit-Leftwich, A. (2008). Understanding the acceptance of a computer simulation game in the classroom: The role of gender and social interaction. *Computers & Education*, 51(2), 873-883.
 32. UNESCO. (2023). Digital learning policies. UNESCO. Retrieved from <https://www.unesco.org/en/digital-education/policies>

33. Van de Werfhorst, H. G., Kessenich, E., & Geven, S. (2022). The digital divide in online education: Inequality in digital readiness of students and schools. *Computers & Education*, 3(Dec, 2022), 100100.
34. Villena-Taranilla, R., et al. (2022). Effects of virtual reality on learning outcomes in K-6 education: A meta-analysis. *ScienceDirect*, 174(1), 101790.
35. Voogt, J., & Roblin, N. P. (2012). A comparative analysis of technological pedagogical content knowledge. *Journal of Computer Assisted Learning*, 28(3), 203-219.
36. Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.
37. Warschauer, M. (2003). Technology and social inclusion: Rethinking the digital divide. *Teachers College Record*, 105(3), 467-490.
38. Warschauer, M., & Matuchniak, T. (2010). *New Technology and Digital Worlds: Analyzing Evidence of Equity in Access, Use, and Outcomes*. *Review of Research in Education*, 34(4), 179-225.
39. Warschauer, M. (2011). *Learning in the Cloud: How (and Why) Online Digital Breakthroughs Are Creating the Future of School*. Teachers College Press.
40. Wu, D., Wang, J., & Che, Z. (2024). Digital Education: Connotation, Pathway, and Trend. *Frontiers of Digital Education*, 1(1), 59-68.