Citra Journal of Innovative Education Practices

Journal homepage:
https://citralestari.my/index.php/cjiep/index
ISSN: 3093-6942

Evaluation of the DDR Method for Developing Technology-Enhanced Learning Frameworks in Higher Education: A Bangladeshi Context

Motia Mannan[1,*], Tarekol Islam Maruf[2], Md Liaquat Ali[3]

[1] Department of Education, Universiti Tun Abdul Razak (Unirazak), Malaysia
[2] Department of Business, Management & Technology, Alfa University College (AUC), Malaysia
[3] Department of Pediatrics, North Bengal Medical College, Sirajgonj, Bangladesh

ARTICLE INFO

Article history:
Received 15 August 2025
Received in revised form 25 September 2025
Accepted 1 October 2025
Available online 10 October 2025

Keywords:
Design Development and Research (DDR); technology-enhanced learning; critical thinking; higher education; Bangladesh

ABSTRACT

Higher education in Bangladesh is expanding rapidly, but many academes prioritize lecture-based teaching over critical thinking and peddling. This results in a mismatch between learners' experiences and the competences required by academic and professionals. In response to this challenge, this study examines the application of the Design, Development, and Research (DDR) method to develop a TEL framework for enhancing critical thinking in Bangladeshi tertiary education. The aim of this study is to explore how DDR can be designed and evaluated local perspectives. A qualitative research methodology has been used to reach the objective of this study. After the DDR phase, there were three successive phases in the research: design phase, in which the framework was designed based constructivist and student-centered learning principles, development phase, where interactive digital modules and collaborative activities were developed; and evaluation phase, in which qualitative methods such as focus group discussions, classroom observations and reflective interviews with students and instructors was carried out. The main findings demonstrate that the DDR approach allowed for an iterative process in constructing context-sensitive and adaptable framework. Students commented that technology-based tasks promoted deeper questioning as well as more robust inquiry practices and they felt confident about sharing their diverse opinions. Instructors reported higher levels of classroom engagement and depth of academic conversation in their classes than when they lectured. The main implication is that the DDR approach is useful for the construction of models that enhance learning through technology and helps promote critical thinking in Bangladeshi universities. The originality of this research work lies in its dual application of DDR, not only as an evaluation but also as a design tool being employed in a unique way in the context of the HEIs of Bangladesh.

* *Corresponding author.*
E-mail address: motia0024@gmail.com

https://doi.org/10.37934/cjiep.3.1.1324

1. Introduction

The higher education system in Bangladesh has experienced rapid growth over the past few decades, with more students attending school and an increasing number of universities. Despite these developments, however, the majority of universities still teach with traditional lecture-based models that transmit information rather than facilitate learning. Such methods frequently do little to develop more advanced cognitive abilities, particularly critical thinking, a fundamental skill that students can use in their studies and profession [56]. Critical thinking is not just about having information but being able to understand and apply the information, analyze the inferences that are drawn from it, generate a conclusion about what might be happening, evaluate whether those conclusions fit with available data and reject or confirm possible answers, and consider all possibilities in the first place.

Technology-Enhanced Learning (TEL) has significant potential in tackling the requirements for more stimulating, participatory and student-centred learning [34]. Research by Yadav [65] asserted that TEL leverages digital technologies and interactive environments to provide more engaging learning experiences for students where they can be challenged with authentic problems, work collaboratively with their peers, and reflect on the learning process. It creates conditions favorable to active learning, in which students must work intensely with the material and be critical about it.

The DDR (Design, Development and Research) approach is particularly appropriate to the development of TEL frameworks targeting local contexts and specific educational aims [5,58]. This design, which promotes responsive adaptation and ongoing feedback, supports the framework in keeping pace with practitioner demands and the changing needs of students and teachers. (Munafo [40] and Naser and Harb [41] mentioned that DDR grounded in DBR Design-Based Research (DBR) encompasses designing educational interventions that you can subsequently test, evaluate and refine based on collaborative research. This method will be applied in this research to develop a TEL model, which develops critical thinking among the Bangladeshi students.

This study will examine two principal inquiries. Which design concepts and contextual elements should inform the development of a technology-enhanced learning framework aimed at promoting critical thinking in higher education in Bangladesh? How can the DDR technique be utilized to create digital modules and collaborative learning activities that enhance critical thinking in university students? This study aims to enhance the ongoing discourse on educational innovation in Bangladesh by exploring these questions and offering a customizable and replicable applied model, particularly relevant to other developing countries with analogous contextual factors.

2. Literature Review

2.1 Theories Underpinning Critical Thinking

Critical thinking is a foundation of an education and without being able to think critically students will struggle with complex issues that they encounter in both scholastic and professional situations. It's not so much about what you know as it is your ability to ask questions, assess evidence and draw conclusions. A number of important theories underpin the development of critical thinking in educational institutions, including higher education.

i.Constructivism: Derived from the work of Jean Piaget and Lev Vygotsky, constructivist theory argues that knowledge is actively constructed by students rather than it being passively transferred [67]. Constructivist theory of learning is characterised by learners who are seen to construct their own knowledge in interaction with the environment leading to stages of cognitive development [44,64].

The active process of learning in constructivism is not only to improve critical thinking and encourage skepticism or finding the truth but also think about what one thinks about mental processes. This theory promotes critical thinking by emphasizing problem solving, collaboration and reflection [27]. Vygotsky also stressed the social aspects of learning and acknowledged that meeting more knowledgeable peers or experts has an important effect in promoting critical thinking [8]. Research by Nguyen [42] found that Vygotsky's Zone of Proximal Development model implies that one major factor to critical thinking is the guidance from "more knowledgable" peers or experts. Vygotsky also supports the implementation of collaborative learning and peer feedback in the classroom, which both include critical thinking.

ii. Bloom's Taxonomy: Bloom's taxonomy (1956), an influential model in educational theory, classifies cognitive skills into levels of increasing difficulty, ranging from simple remembering of facts to more complex thinking that doesn't rely on prior knowledge like evaluation, synthesis and creation [46]. The model has been useful in the creation of instructional design, offering a defined approach for educators to construct learning goals that require critical engagement with academic material [39]. When students are taught to look closely at case studies, consider the means of solving them, and assimilate different perspectives; Bloom's Taxonomy is employing teachers who help develop individuals having a critical outlook at all levels of study [14].

iii. Cognitive Load Theory: Cognitive Load Theory claims that the brain can only process a limited amount of information at any given time. This has important consequences for the design of instruction, indicating that while learning activities should be guided to minimise cognitive load they must also be expected to allow for deep thinking [61]. In the field of TEL, these patterns emphasize the need for a design of digital content that is engaging but not overwhelming and provides the opportunity for students to concentrate on higher-order thinking activities without disturbance [21, 24].

2.2 The DDR Method and its Role in Educational Design

The Design, Development, and Research (DDR) approach is a variant of design-based research (DBR), focused on the active cycle of designing, testing, and refining educational interventions. DDR achieves its flexibility from the real-world context, which makes it a appropriate methodology of TEL systems creating [38].

Phase Design: The first of the two DDR's phases correspond to the visualization and conceptualization of learning framework for initial situation, theoretical elements and context features [31]. This is especially critical in a nation like Bangladesh, which faces unique cultural, technological, and resource-related barriers [3]. Adhikari, [2] opined that The TEL design is compatible with constructivist learning theory and pedagogy as well as student centered teaching values which facilitate active participation, social interaction and reflection. Besides, Rebelo *et al.,* [53] highlighted that the decisions to be taken in this phase are concerning the digital tools, how collaborations activities could be structured and organization of the learning modules to promote critical thinking.

Development phase: In this phase the designed framework is converted to reality. Here the emphasis has shifted to generating interactive digital modules and cooperative learning resources that meet the socio educational objectives. Research by Xie *et al*., (2025) found that project-based learning

(PBL) and scenario-based simulation may be designed that encourage student engagement with authentic problems by students needing to think critically. This phase also involves the creation of assessment instruments to assess student engagement and critical thinking power [17].

Evaluation Phase: It is not explicit within the research questions, but the evaluation phase has an important function in establishing whether the TEL framework proved to be successful [36]. Third phase of evaluation will incorporate qualitative research tools such as focus groups, interviews and observations to collect data from students and instructors. An analysis is conducted on this data to understand how the framework has been in achieving critical thinking, student engagement and the perceived success of faculty at enabling more active learning in the classroom.

2.3 Technology-Enhanced Learning (TEL) and Critical Thinking

Technology-Enhanced Learning (TEL) has been a valuable asset in promoting critical thinking in higher education. Incorporating digital technologies, including online systems, multimedia resources, and interactive simulations, TEL aims to convert passive traditional teaching into more active forms of learning that are better centered around the learner [59]. These tools provide students with the space to collaborate, reflect, and engage in content at deeper levels, as skills required to think critically [15].

Research has demonstrated that TEL can enhance student engagement, problem solving and peer collaboration- three important aspects of the learning process enabling the development of critical thinking [12]. For instance, noted the importance of interactive simulations in which students solve real-world problems and have to interpret data, consider various solutions and reflect on outcomes. These simulations, which are a cornerstone of many TEL tools, facilitate the experience with difficult situations and teach how to think in critical way by facing real-life problems [48].

In addition, online interactional environments (forums, discussion boards and wikis) offer students the opportunity to participate in peer learning, argumentation and knowledge co-construction [33]. This is consistent with Vygotsky's concept of social constructivism where knowledge is developed in the presence of others. In the situation of TEL, this collaborative activity leads to students being able to evaluate multiple perspectives critically, gain a much deeper understanding and become accustomed more subtle approaches on solving problems [32].

Nevertheless, the effective use of TEL depends on a critical reflection on technological infrastructure. Given the issues of internet connectivity, access to devices, and digital literacy in Bangladesh, TEL frameworks must be flexible and inclusive [30]. On the other hand, Yassin [66] mentioned that the proliferation of mobile learning and open educational resources (OER) offer great potential to extend the reach of technology access and encourage critical thinking in education. Resources strapped environments themselves can use mobile apps and online platforms for engagement and deeper learning [52].

2.4 The Theoretical Framework

Interactive Digital Modules: These modules are interactive and offer students the opportunity to work in real-world contexts, with video documentary, simulation games and virtual worlds.

Cooperative Learning Techniques: These may include such things as group discussions, peer review, and group projects that help students to challenge each other’s thinking, compare disparate perspectives, and construct a cumulative understanding of the materials.

Reflection: This will encourage the use of contemplative exercises for students to practice metacognition, such as developing journals entries, self- and peer-assessments that reflect on how they think, how cognitive biases may be influencing them, or how their thought process can become more complex.

This model will serve as the yardstick for designing and evaluating the TEL framework, with a clear emphasis on relevance for critical thinking and fit with the specific context of Bangladeshi higher education.

2.5 Conceptual Framework

The concept is built upon the principles underlying constructivist learning, student-centered pedagogy and Technology Enhanced Learning (TEL) to establish an integrated pedagogical model for promoting critical thought. It focuses on active learning, cooperation and reflection, which are all necessary to foster higher-level thinking skills.

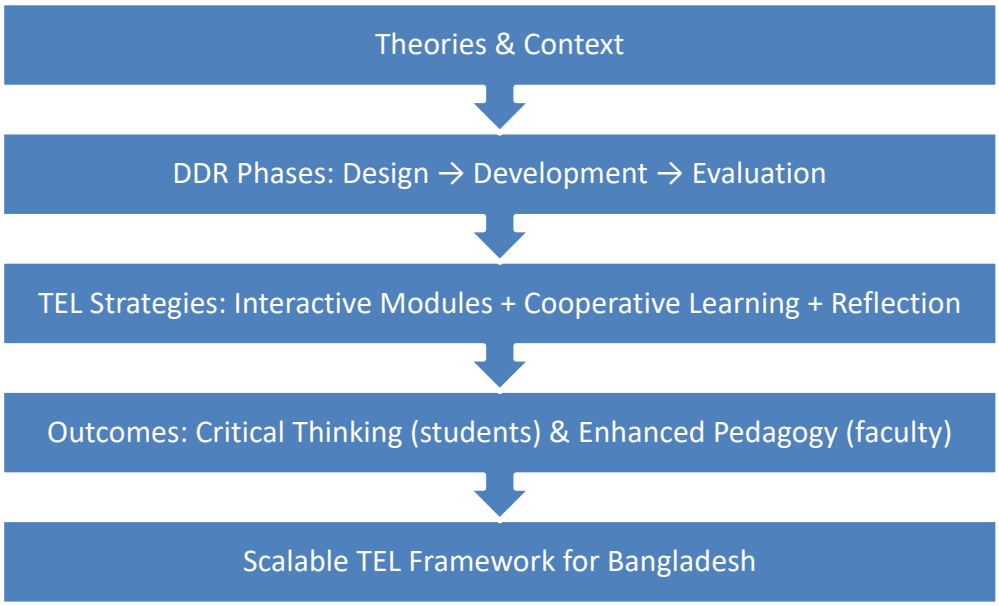

Fig. 1. Conceptual Framework (Source: Surbakti *et. al.*, [61])

3. Research Methodology

This study utilizes a qualitative design-based approach grounded in the Design, Development, and Research (DDR) methodology. DDR is particularly advantageous for the creation and evaluation of educational frameworks, as it integrates iterative design, contextual development, and empirical validation. This research used DDR to ensure that the final Technology-Enhanced Learning (TEL) framework is contextually pertinent and aligned with the needs of Bangladeshi higher education institutions. The DDR methodology guided the research through three interconnected phases.

3.1 Design Phase

The framework was constructed utilizing principles from constructivism, Bloom's Taxonomy, and cognitive load theory to ensure alignment with the objectives of critical thinking. Selecting appropriate digital tools, designing collaborative learning activities, and establishing interactive modules that foster problem-solving, reflection, and peer engagement were all critical design considerations. Experts from the higher education faculty and curriculum specialists were solicited for their thoughts to validate the initial concept.

3.2 Developmental Stage

The conceptual strategy was transformed into practical learning modules utilizing TEL techniques such as interactive simulations, project-based learning (PBL) initiatives, online discussion forums, and multimedia teaching resources. Cooperative learning frameworks, such as group projects and peer reviews, were implemented to promote collaboration and dialogue. Digital literacy training sessions were incorporated to assist individuals who may struggle with utilizing modern technology.

3.3 Evaluation Phase

The framework was assessed in several Bangladeshi universities to determine its efficacy.
Methods for Data Collection:
Conduct Focus Group Discussions (FGDs) with students to gather their insights on enhancing critical thinking and their utilization of the product. Classroom observations to assess student engagement, collaboration, and introspection during TEL activities. Partially organized Interviews with educators to evaluate pedagogical adaptation, perceived benefits, and challenges.

3.4 Data Analysis

Researchers employed thematic analysis to identify recurring patterns in the responses of both students and teachers. They utilized data from multiple sources to enhance the reliability of the assumptions.

3.5 Sampling

Researchers employed purposive sampling to select participants from two public universities and one private university in Bangladesh. Twenty-five undergraduate students from the faculties of education and business participated in TEL-based classroom activities and reflective exercises. Besides, a group of around eight lecturers with varying degrees of digital literacy was included to provide views into pedagogical adaptability and implementation challenges.

4. Result and Discussion

4.1 Contextual Challenges in Implementing TEL in Bangladesh

The adoption of Technology-Enhanced Learning (TEL) in Bangladesh is riddled with profound challenges, mainly related to infrastructure and digital literacy. Rural state universities especially have unreliable access to the internet and limited availability of digital devices [25]. The digital divide makes it impossible for students to participate equally in online learning platforms, and does nothing

but create disparity in education. To overcome these challenges a coordinated solution is required that involves using offline learning modules, mobile-based learning solutions and affordable digital technology [23]. Furthermore, faculty and students both have challenges with digital literacy. Digital skills training are needed to support both groups in order that they can successfully participate with technology-enhanced learning. These will aid to close the digital divide enabling all students irrespective of their borders or financial backgrounds enjoy the TEL into their countries [13,18].

4.2 The Contribution of Faculty Training to TEL Deployment

TEl naturally involves staff and their involvement also plays a crucial role in determining the success of implementation. A significant number of Bangladeshi teachers follow predominantly lecture method based traditional pedagogy that does not promote critical thinking or active learning [28]. Hence, professional development programs are necessary for training lecturers in how to construct interactive, technology-supported learning tasks that trigger high-level thinking among the students [7]. Training must consider the pedagogical benefits for students, not only the technical functionalities of TEL tools. Continued support systems through access to instructional designers, peer networking opportunities and IT-support are also essential in assuring that teachers feel confident and supported using TEL [45,54]. Hence, Shohel *et al*., [55] opined that with adequate capabilities and support, faculty in Bangladesh can efficiently embed TEL into higher education.

4.3 TEL Framework Evaluation on Developing Countries

Assessment of TEL institutions in other developing nations that are relatively advanced compared to Bangladesh can inform the schemes' prospects for success in Bangladesh [35]. Such as in India and Kenya, and other countries that face comparable difficulties but have progressed meaningfully in making use of mobile learning and interactive digital platforms to keep students engaged [4]. And mobile learning applications have demonstrated impressed capabilities in mitigating network connectivity challenges through the offline access to educational materials [22]. This is an important lesson for TEL frameworks that flexibility must be built in to them and iterative feedback from teachers and students must be sought [20]. Further, feedback-based evolutionary process ensures that TEL model is ever-responsive to the changing demands of its local context [47].Othman *et al*., [47] highlighted that by utilizing such global examples, Bangladesh may develop a TEL model that is contextually appropriate; promotes critical thinking and the active participation of students through collaborating in learning and solving problems.

4.4 Cost-Effectiveness and Scalability of TEL Frameworks

For TEL to have a sustainable future in Bangladesh, it needs to be developed with scalable plan [9]. TEH frameworks should be cost efficient since the country’s finances are tight using low maintenance technologies which do not need to be upgraded in very short intervals [49]. Solutions such as OER and affordable digital resources can provide a cost-effective means to implement these standards while still providing quality learning experiences. There’s also the issue of scalability [26]. A TEL framework has to be flexible, for instance, in its applicability to different institutions of higher education ranging for example from large public universities to small private colleges [19]. Pilot projects can be launched in some schools, with the model iterated and improved before it’s rolled out across the county [16]. Starting with flexible and scalable framework for developer, TEL can be

well practiced throughout the various educational institutions in Bangladesh and enhance technology-based learning among students [62].

4.5 Ethical and Equity issues in TEL Implementation

When designing TEL frameworks, the ethical and equity issues need to be taken into account to provide equal learning opportunities for all students irrespective of their background or geography [1]. In Bangladesh, unequal access to technology is one of the greatest challenges. Students from poorer or more rural backgrounds may not have the same access to digital devices and stable internet as their urban counterparts [11]. Re-mediation for this issue could be soft loans on device systems, student discount network packs or supply of off-line learning materials that don't require endless internet [50,51]. Furthermore, TEL models need to involve data privacy consideration, especially protecting the student's personal and academic information. Guidelines for data protection and notification should be also created to avoid privacy misgivings and comply with international standards [37].

4.6 TEL in Bangladeshi Higher Education in the Future

Future of TEL in Bangladesh is bright and advanced learning technologies like AI, VR and personalized learning system can be the next step [60]. AI powered tools, for one thing can give students targeted feedback and insight into what they might want to study next, and VR can involve them in a virtual environment that facilitates hands-on learning and critical thinking [57,63]. Policy makers need to realize the TEL is important for improving quality of education and facilitate its expansion by means of funding and policies [10]. With sufficient resources and support, TEL can revolutionise Bangladeshi HE in a way that produces graduates who are not only good at technology but good at thinking creatively and solving problems [8].

Through scaling such as infrastructure, faculty preparedness, scalability and equity etc., the proposed TEL framework will be modified to meet Bangladesh higher education system necessity [6]. Given the changing terrain of educational technology, this is a scalable and inclusive model for developing critical thinking with TEL [43]. Kayes [29] mentioned that with continued support, consideration of design and technology options TEL has the potential to transform the learning environment for students in Bangladesh.

5. Conclusion and Future Work Direction

This study evaluated the effectiveness of the Design, Development, and Research (DDR) process in developing a Technology-Enhanced Learning (TEL) framework aimed at improving critical thinking abilities among Bangladeshi higher education students. The framework, which drew on constructivist ideas, Bloom's taxonomy, and cognitive load theory, emphasized interactive digital modules, cooperative learning approaches, and reflective practices. Focus groups, classroom observations, and instructor comments all show that the DDR technique supported an iterative and context-sensitive design process. Students indicated greater confidence in inquiry-based and collaborative learning, while teachers reported higher levels of classroom engagement compared to traditional lecture approaches. These outcomes demonstrate DDR's ability to incorporate instructional theory and technological innovation in situations with limited resources.

Despite its facts, this study has considerable limitations. The study used a qualitative methodology and had a small sample size, which limited the generalizability of the findings. The

review was completed with a focus on immediate perceptions rather than long-term outcomes. Contextual obstacles, such as digital literacy gaps and disparities in infrastructure between institutions, also hampered the implementation process. Furthermore, the study focused exclusively on student and instructor perspectives, failing to thoroughly investigate institutional laws, administrative help, or financial processes that influence TEL uptake.

These limits signal substantial opportunities for future initiatives. Longitudinal and mixed-methods research will be conducted to assess the long-term effects of TEL frameworks on student results across semesters and higher education environments. Expanding the focus to include rural colleges and business organizations will provide new insights into scalability and adaptation. Future research should look into the use of future technologies such as artificial intelligence (AI), virtual reality (VR), and adaptive learning platforms to improve customization and interactivity. Finally, future research should emphasize issues of fairness, inclusivity, and ethics, particularly providing access to impoverished students and ensuring data privacy.

Finally, the study provides both a practical framework and a theoretical contribution by demonstrating how DDR can serve as a systematic method to the development and assessment of TEL in higher education. The approach is based on the circumstances in Bangladesh, but it can also be applied in other countries facing similar challenges. It demonstrates how to create higher education institutions that are more student-centered, use more technology, and promote critical thinking.

References

[1] Adel, Amr, Ali Ahsan, and Claire Davison. "ChatGPT promises and challenges in education: Computational and ethical perspectives." *Education Sciences* 14, no. 8 (2024): 814. https://doi.org/10.3390/educsci14080814

[2] Adhikari, Anasuya. "Autopoiesis and the Montessori Educational Paradigm: A Theoretical Framework Relating its Resonance with NEP 2020." *International Research Journal of Education and Technology* 8, no. 7 (2025): 500-514.

[3] Ahatsi, Emmanuel, and Oludolapo Akanni Olanrewaju. "Resilience in Humanitarian Supply Chains: Addressing Artificial Intelligence and Big Data Hurdles Across Borders." *Engineering Reports* 7, no. 7 (2025): e70310. https://doi.org/10.1002/eng2.70310

[4] Akpan, Ikpe Justice, Onyebuchi Felix Offodile, Aloysius Chris Akpanobong, and Yawo Mamoua Kobara. "A comparative analysis of virtual education technology, e-learning systems research advances, and digital divide in the global south." In *Informatics*, vol. 11, no. 3, p. 53. MDPI, 2024. https://doi.org/10.3390/informatics11030053

[5] Al Amri, Kamla Sulaiman. "Guidelines for Integrating Care Pedagogy into Faculty Development for Future Emergency Remote Teaching (ERT) in Higher Education: The CARE Framework." (2025).

[6] Alam, Taufique. "Impact and challenges of introducing blockchain technology in procurement and supply chain management for power transmission utilities: a case study of Power Grid Bangladesh PLC." PhD diss., BRAC University, 2025.

[7] Alanazi, Abdulaziz Abdullah, Kamisah Osman, and Lilia Halim. "Development of technology-enhanced higher order thinking learning module based on scaffolding and guided discovery approaches." In *2024 Yearbook Emerging Technologies in Learning*, pp. 485-509. Cham: Springer Nature Switzerland, 2025. https://doi.org/10.1007/978-3-031-80388-8_26

[8] Asrifan, Andi, Sitti Nurhidayah Ilyas, A. Sri Wahyuni Asti, Fadhilah Afifah, Angri Lismayani, and Syamsuardi Saodi. "Educational Experience and Expertise: Exploring Terminological Dimensions in Shaping Childhood." In *Shaping Childhood Through Educational Experiences*, pp. 1-28. IGI Global Scientific Publishing, 2025. https://doi.org/10.4018/979-8-3693-9969-9.ch001

[9] Azim, Mohammad Istiaq, and Samina Rahman. "Digital Financial Inclusion: A Lifeline for Sustainable Development Goals—Lessons from Bangladesh Through Crisis and Beyond." In *Financing of Sustainable Development Goals (SDGs) Challenges and Opportunities*, pp. 193-216. Cham: Springer Nature Switzerland, 2025. https://doi.org/10.1007/978-3-031-80478-6_9

[10] Azizah, Siti, and Dede Aprylasari. "FARMER: THE DECISION MAKER." *Yayasan Drestanta Pelita Indonesia* (2025).

[11] Begum, Najma, and Nabi Gul. "Bridging the Gap: The Role of Technology in Reducing Educational Inequality in Developing Countries." *ASSAJ* 3, no. 02 (2025): 2409-2421.

[12] Cong, Lin, and Chinaza Solomon Ironsi. "Integrating mobile learning and problem-based learning in improving students action competence in problem-solving and critical thinking skills." *Humanities and Social Sciences Communications* 12, no. 1 (2025): 1-11. https://doi.org/10.1057/s41599-025-05397-4

[13] Demirdis, Bahaddin. "Integrating digital literacy to enhance emotional and social skills in education." In *Innovative Educational Frameworks for Future Skills and Competencies*, pp. 1-38. IGI Global Scientific Publishing, 2025. https://doi.org/10.4018/979-8-3693-7555-6.ch001

[14] Devassy, Jithin, Mihika Sameer Godbole, and Ishita Ishita. "Restructuring Leaner-Centric Approach Framework Through Revised Bloom Taxonomy." In *Psychological Patterns and Lifestyle Influences in Academia Experience*, pp. 201-226. IGI Global Scientific Publishing, 2025. https://doi.org/10.4018/979-8-3693-8709-2.ch008

[15] Dignam, Christopher. "Makerspace and the 5 C's of learning: Constructing, collaborating, communicating, critically-thinking, and creatively-thinking." *International Journal of Studies in Education and Science* 6, no. 1 (2025): 104-127. https://doi.org/10.46328/ijses.135

[16] Diyaolu, Christianah Omolola. "Advancing maternal, child, and mental health equity: A community-driven model for reducing health disparities and strengthening public health resilience in underserved US communities." *World J Adv Res Rev* 26, no. 03 (2025): 494-515. https://doi.org/10.30574/wjarr.2025.26.3.2264

[17] Dizon, Arnie G. "Development of a Framework for the Assessment of Critical Thinking in Grade 10 Social Studies." *The Social Studies* 116, no. 2 (2025): 95-115. https://doi.org/10.1080/00377996.2024.2364669

[18] Enny, Farjana Soriya, Motia Mannan, and Tarekol Islam Maruf. "The Impact of Globalization on Intercultural Communication and Education: A Qualitative Study."

[19] Filippou, Kalypso, Emmanuel O. Acquah, and Anette Bengs. "Inclusive policies and practices in higher education: A systematic literature review." *Review of Education* 13, no. 1 (2025): e70034. https://doi.org/10.1002/rev3.70034

[20] Fleckney, Paul, James Thompson, and Paulo Vaz-Serra. "Designing effective peer assessment processes in higher education: a systematic review." *Higher Education Research & Development* 44, no. 2 (2025): 386-401. https://doi.org/10.1080/07294360.2024.2407083

[21] George, A. Shaji, T. Baskar, and P. Balaji Srikaanth. "The erosion of cognitive skills in the technological age: How reliance on technology impacts critical thinking, problem-solving, and creativity." *Partners Universal Innovative Research Publication* 2, no. 3 (2024): 147-163.

[22] Ghoulam, Khalid, and Belaid Bouikhalene. "Exploring the Impact of Mobile Devices in E-Learning: A case Study Evaluating its Effectiveness." *Educational Challenges* 29, no. 2 (2024). https://doi.org/10.34142/2709-7986.2024.29.2.06

[23] Han, Siew Ping, and Ben Kumwenda. "Bridging the digital divide: Promoting equal access to online learning for health professions in an unequal world." *Medical Education* 59, no. 1 (2025): 56-64. https://doi.org/10.1111/medu.15455

[24] Isaacson, Atara. "Promoting Creativity and Independent Learning." In *Creative Methods in Teaching and Learning: Fostering Teacher-Student Success*, pp. 9-37. Cham: Springer Nature Switzerland, 2025. https://doi.org/10.1007/978-3-031-94653-0_2

[25] Islam, Md Hafizul, Md Abdun Nayeem, Md Istiak Ahamed Liton, Junaid Jamill Sizan, and Siam Sadik. "The role of educational technology in enhancing learning in developing countries." *Journal of Scientific Reports* 7, no. 1 (2024): 197-212. https://doi.org/10.58970/JSR.1051

[26] Ismail, Syofianis, and Zhang Ling. "Digital Learning: A Solution for More Inclusive and Affordable Education." *International Journal of Education and Digital Learning (IJEDL)* 3, no. 4 (2025): 191-200. https://doi.org/10.47353/ijedl.v3i4.260

[27] Johnson, Daniel C. "Music listening and critical thinking: Teaching using a constructivist paradigm." (2024). [28]Jony, M. S. (2025). *Effectiveness of the Teachers' Training Programs Offered in the Government Teachers' Training Colleges in Providing Quality Teaching at Secondary Schools in Bangladesh* (Doctoral dissertation, © University of Dhaka).

[29] Kayes, Mohammad Abul Hossain. "Comprehensive Analysis of Strategic Approaches in the Digital Transformation of the Higher Secondary Education in Bangladesh." *Bangladesh Teacher Education Journal (BTEJ)*: 87.

[30] Khan, Faiyaz Morshed. "Exploring usability issues of e-government websites in Bangladesh and their impact on users with limited digital literacy." PhD diss., Brac University, 2025.

[31] Kusharyadi, Rahmat, Siti Fatimah, and Kusnandi Kusnandi. "A praxeological review of concept-sequence and series: Comparing Malaysia and Indonesia textbooks." *Jurnal Elemen* 10, no. 2 (2024): 239-259. https://doi.org/10.29408/jel.v10i2.24079

[32] Le, Ha Van, and Long Quoc Nguyen. "Promoting L2 learners' critical thinking skills: the role of social constructivism in reading class." In *Frontiers in Education*, vol. 9, p. 1241973. Frontiers Media SA, 2024. https://doi.org/10.3389/feduc.2024.1241973

[33] Mannan, Motia, and Tarekol Islam Maruf. "Perceived Usefulness and Perceived Ease of Use in the Worth of Online Education System in Bangladesh." In *Second International Conference on Innovations in Management, Science, Technology and Automation in Sports (ICIMSTAS-2023)*. 2024.
[34] Mannan, Motia, Zaida Binti Mustafa, S. F. B. A. Aziz, and Tarekol Islam Maruf. "Technology adoption for higher education in Bangladesh–development and validation." *Journal of Education and Social Sciences* 24, no. 1 (2023): 1-9.
[35] Mannan, Zahed. "Public Private Partnership in the Higher Education Sector in Bangladesh: A Study on Model Building for Efficient Management System and Implementation Mechanism." PhD diss., © University of Dhaka, 2024.
[36] Maxim, Raluca Ionela, and Joan Arnedo-Moreno. "Identifying key principles and commonalities in digital serious game design frameworks: Scoping review." *JMIR Serious Games* 13 (2025): e54075. https://doi.org/10.2196/54075
[37] Mohamed, Yasir Abdelgadir, Abdul Hakim Mohamed, Akbar Kannan, Mohamed Bashir, Mousab AE Adiel, and Muawia A. Elsadig. "Navigating the ethical terrain of ai-generated text tools: a review." *IEEE Access* (2024). https://doi.org/10.1109/ACCESS.2024.3521945
[38] Mohsin, Norharyanti, and Siti Hajar Halili. "Implementing Design-Based Research in Developing Mobile Flipped Learning Module at TVET Institution." In *Multidisciplinary Educational Perspectives on Design-Based Research*, pp. 429-470. IGI Global Scientific Publishing, 2025. https://doi.org/10.4018/979-8-3693-8452-7.ch010
[39] Montello, M. B., SA Bezerra de Moura, and B. J. Abreu. "Bloom's taxonomy as a tool for educational objectives applied to human anatomy." *Morphologie* 109, no. 364 (2025): 100943. https://doi.org/10.1016/j.morpho.2024.100943
[40] Munafo, Koran Nichole. *Using Design Based Research (DBR) to Map an Online Universal Design for Learning (UDL) Multidisciplinary Framework of Instructional Coaching*. University of Hawai'i at Manoa, 2024.
[41] Naser, Khadijeh Mohammad, and Esraa Saleem Harb. "Application of Design Based Research (DBR) in Instructional Technology: Middle East Education Perspective." In *Global Perspectives and Implementations of Design-Based Research*, pp. 65-100. IGI Global Scientific Publishing, 2025. https://doi.org/10.4018/979-8-3373-2086-1.ch003
[42] Nguyen, Thi Thanh Thao. "Teacher Scaffolding and Collaborative Learning in Public Speaking: Voices of Students." *International Journal of English Language Studies* 7, no. 1 (2025): 01-07. https://doi.org/10.32996/ijels.2025.7.1.1
[43] Noroozi, Omid. "Towards Technology-Enhanced Transformative Learning Environments." *International Journal of Technology in Education* 8, no. 2 (2025): 541-556. https://doi.org/10.46328/ijte.1209
[44] Nurhasnah, Nurhasnah, Nana Sepriyanti, and Martin Kustati. "Learning theories according to constructivism theory." *Journal International Inspire Education Technology* 3, no. 1 (2024): 19-30. https://doi.org/10.55849/jiiet.v3i1.577
[45] Nzuza, Siyacela Thandazani. "Preparing Pre-Service Teachers for Equitable Technology-Enhanced Learning (TEL) in Diverse Classroom Settings." In *Empowering Pre-Service Teachers to Enhance Inclusive Education Through Technology*, pp. 127-154. IGI Global Scientific Publishing, 2025. https://doi.org/10.4018/979-8-3693-8759-7.ch005
[46] Orhani, Senad. "Preparation of tests from the subject of mathematics according to bloom's taxonomy." *International Journal of Research Publication and Reviews* 5, no. 2 (2024): 2335-2345. https://doi.org/10.55248/gengpi.5.0224.0542
[47] Othman, Mahfudzah, Aznoora Osman, Siti Zulaiha Ahmad, and Natrah Abdullah. "A Comparative Study of Interactive Technology-Enhanced Learning (TEL) Models with Gamification and Multimedia for Low Achievers in Programming." In *2022 2nd International Conference on Electronic and Electrical Engineering and Intelligent System (ICE3IS)*, pp. 334-339. IEEE, 2022. https://doi.org/10.1109/ICE3IS56585.2022.10010275
[48] Papaneophytou, Christos, and Stella A. Nicolaou. "Promoting Critical Thinking in Biological Sciences in the Era of Artificial Intelligence: The Role of Higher Education." *Trends in Higher Education* 4, no. 2 (2025): 24. https://doi.org/10.3390/higheredu4020024
[49] Rahman, Md Ashiqur, and Rawnaq Ara Parvin. "Advancing Bangladesh's Digital Transition: From Digital Foundations to Technological Leadership." (2024). https://doi.org/10.20944/preprints202410.0441.v1
[50] Raisa, Khadija Khan. "Navigating Sustainable Finance in Bangladesh: The Role of Banks and Financial Institutions." (2024).
[51] Rana, Masud, Hasibul Islam, Md Abdullah Al Mamun, and Rebeka Sultana Rekha. "Impacts of bank loan performance, stability and risk factors on sustainable development goals: insights from South and Southeast Asia." *Asia-Pacific Journal of Regional Science* 9, no. 2 (2025): 449-478. https://doi.org/10.1007/s41685-025-00377-7

[52] Rayan, Nafis, Srejon Ahamed Joy, M. D. Khan, and Abtahi Shipar. "Developing an intelligent virtual assistant for extended reality environments: a multi-modal approach for understanding user intent and context using computer vision, natural language processing, and large language model." PhD diss., Brac University, 2025.

[53] Rebelo, Hugo, Panagiota Christodoulou, Rita Payan-Carreira, Daniela Dumitru, Elena Mäkiö, Juho Mäkiö, and Dimitrios Pnevmatikos. "University–business collaboration for the design, development, and delivery of critical thinking blended apprenticeships curricula: Lessons learned from a three-year project." *Education Sciences* 13, no. 10 (2023): 1041. https://doi.org/10.3390/educsci13101041

[54] Sam, Rany. "Challenges and opportunities of educational technology integration in Cambodian higher education institutions: A literature review." *Available at SSRN 4849873* (2024).

[55] Shohel, M. Mahruf C., Md Ashrafuzzaman, Sabrina Ahmed, Nazia Tasnim, Tahmina Akter, GM Rakibul Islam, Mohammad Abu Bakar Siddik, and Sumaya Rahman Mitu. "Participatory pedagogical approaches in higher education: Understanding from the practices in Bangladesh, the UK and the USA." In *Inclusive Pedagogy in Contemporary Education*. IntechOpen, 2024.

[56] Silva, J., J. Edmond, and C. Jauregui. "Critical Thinking in the Classroom: Faculty Perspectives and Practices." *Journal of Education and Learning* 14, no. 3 (2025): 1-20. https://doi.org/10.5539/jel.v14n3p1

[57] Soriya, Farjana, Tarekol Islam Maruf, and Motia Mannan. "The Echoes of Partition: Representations of the 1947 Bangla Division in Bengali Short Stories."

[58] Soto, Brenda M. "Addressing Accessibility Barriers in Online Learning: A DDR Model Use Study Augmenting the R2D2/C3PO Model." PhD diss., National University, 2025.

[59] Stenseth, Hege Vistven, Simen Alexander Steindal, Marianne Trygg Solberg, Mia Alexandra Ølnes, Andrea Mohallem, Anne Lene Sørensen, Camilla Strandell-Laine et al. "Simulation-based learning supported by technology to enhance critical thinking in nursing students: protocol for a scoping review." *JMIR research protocols* 11, no. 4 (2022): e36725. https://doi.org/10.2196/36725

[60] Sultana, Rebaka, and Mohammad Faruk. "Does artificial intelligence increase learners' sustainability in higher education: insights from Bangladesh." *Journal of Data, Information and Management* 6, no. 2 (2024): 161-172.

[61] Surbakti, Rudy, Satria Evans Umboh, Ming Pong, and Sokha Dara. "Cognitive load theory: Implications for instructional design in digital classrooms." *International Journal of Educational Narratives* 2, no. 6 (2024): 483-493. https://doi.org/10.1007/s42488-024-00121-4

[62] Uddin, Md Ishtiak, Syed Sadrul Huda, Biswajit Das, and Promita Shabnam Khan. "Transforming education with smart educational platform in Bangladesh: A case study on 10 Minute School." *Journal of Information Technology Teaching Cases* (2025): 20438869251362868. https://doi.org/10.1177/20438869251362868

[63] Uddin, Mohammad Jashim. "Artificial Intelligence in Bangladeshi Higher Education: Future and Challenges." *Journal of Gender Education and Society* 4, no. 2 (2025).

[64] Wibowo, Sigit, Muhammad Nur Wangid, and Fery Muhamad Firdaus. "The Relevance of Vygotsky's Constructivism Learning Theory with the Differentiated Learning Primary Schools." *Journal of education and learning (EduLearn)* 19, no. 1 (2025): 431-440. https://doi.org/10.11591/edulearn.v19i1.21197

[65] Yadav, Seema. "Leveraging AI to enhance teaching and learning in education: The role of artificial intelligence in modernizing classroom practices." In *Optimizing research techniques and learning strategies with digital technologies*, pp. 211-238. IGI Global Scientific Publishing, 2025. https://doi.org/10.4018/979-8-3693-7863-2.ch008

[66] Yassin, Eiman. "Examining the relation of open thinking, critical thinking, metacognitive skills and usage frequency of open educational resources among high school students." *Thinking Skills and Creativity* 52 (2024): 101506. https://doi.org/10.1016/j.tsc.2024.101506

[67] Yildiz, Tolga. "From Constructivism To Cultural Cognition: A Comparative Analysis Of Piaget, Vygotsky, And Tomasello'S Theories Of Cognitive Development." *Humanitas-Uluslararası Sosyal Bilimler Dergisi* 13, no. 25 (2025): 411-429. https://doi.org/10.20304/humanitas.1601228