

Technopreneurship and Presentation Skills as Dual Drivers of Digital Competence in Secondary Education

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Abstract. This report explains the crucial role of technopreneurship and presentation skills in developing strong digital competencies among secondary school students. By analyzing how these two domains, when integrated, provide a holistic approach to equipping students with the knowledge, skills, and attitudes necessary to thrive in the digital age, this report demonstrates their significant contribution to innovation and economic growth.

Keywords: Technopreneurship, Presentation Skills, Digital Competency, Secondary Education.

Introduction

Rapid technological developments and the global economic transformation towards digitalization have reshaped the contemporary educational landscape. Amidst these changes, the education system is faced with the demand to shift its focus from traditional literacy to a more comprehensive mastery of digital competencies. Digital competencies are no longer supplementary but have become a fundamental necessity embedded in every aspect of life—whether for actively participating in the digital society, enhancing competitiveness in the workplace, or engaging in lifelong learning processes. Marais (2023) follows the definition provided by the European Commission (DigComp 2.2, 2022), which states that digital competence means “the confident, critical, and responsible use of, and engagement with, digital technologies for learning, at work, and for participation in society.”

This competency encompasses a combination of knowledge, skills, and attitudes that enable individuals to actively adapt in the era of digital transformation. Therefore, secondary education, as a crucial phase in the formation of character and the foundation of students' competencies, must prioritize digital competency as a primary objective. This directly impacts curriculum development and interdisciplinary learning approaches, which are no longer limited to technology-based subjects but permeate all subjects.

In the context of strengthening digital competencies, this article highlights the importance of technological entrepreneurship and presentation skills as two complementary drivers. Both not only support mastery of digital tools, but also shape creative and innovative thinking, as well as the ability to communicate ideas effectively. (Zhang, 2021) in their study state that the use of digital technologies such as IoT, AI, and AR has “opened new opportunities for innovators and entrepreneurs” and driven changes in how entrepreneurship education is conducted.

This statement underscores that digital entrepreneurship is not merely a trend but an educational approach that enables students to address real-world challenges and design technology-based solutions. Such an approach hones critical thinking skills, problem-solving abilities, and digital content creation as part of entrepreneurial practice. In line with this, the ability to communicate ideas and

innovations convincingly is an important element that cannot be ignored. (Ni Luh Putu Ning Septyarini Putri Astawa & Ida Ayu Oka Purnami, 2024) in the article "Preparing Young Entrepreneurs: How Smart Presentation Applications Drive Innovation Among Vocational High School Students" states that the use of digital presentation applications (such as Canva) "significantly increases creativity in making innovative presentations" and supports students' ability to convey ideas effectively.

The combination of "doing" through technopreneurship activities and "communicating" through digital presentations forms a reflective and applied learning cycle. Students are not only users of technology, but also creators of value through structured and communicative ideas. (L. Chen et al., 2021) also highlight that the process of digital entrepreneurship "bridges the gap between theory and practice," including problem identification and the creation of digital solutions.

These activities implicitly foster mastery of various aspects of digital competencies, ranging from data literacy, content creation, to technology-based communication. However, for the innovations created to have a broad impact, the ability to communicate them effectively is crucial. (Ni Luh Putu Ning Septyarini Putri Astawa & Ida Ayu Oka Purnami, 2024) also discuss the importance of "multimedia elements" and "creative practice" in digital presentations, as well as how audiences can be more engaged in digital formats. This shows that the integration of these two domains is not merely about adding technical skills, but rather promoting a comprehensive understanding and application of digital competencies in real-world contexts.

This article aims to explore how technology entrepreneurship education and digital presentation skills development, either independently or in synergistic combination, can promote the improvement of digital competencies among secondary school students. The following sections will discuss the conceptual definitions of both domains, trace their respective contributions to promoting digital competence, analyze the synergy between them, and evaluate the benefits, implementation challenges, and best practices that can be adopted in an educational context. This study concludes with strategic implications for education stakeholders to promote sustainable transformation.

Methods

This article uses a qualitative literature review approach to explore the conceptual relationship between technological entrepreneurship, digital presentation skills, and the strengthening of digital competencies in secondary education students. A literature review was chosen because the topic discussed is conceptual in nature and emphasizes the integration of theory and educational practice from various reliable sources.

The literature sources reviewed include scientific articles from internationally reputable journals (Scopus-indexed and peer-reviewed), policy reports from official institutions such as the European Commission (particularly the DigComp framework), and recent research relevant to the topics of digital entrepreneurship, 21st-century skills education, and technology-based learning transformation. Data collection was conducted through academic databases such as Google Scholar, ScienceDirect, SpringerLink, and ResearchGate using the keywords: technopreneurship in education, digital presentation skills, digital competence in secondary education, and project-based digital learning. Literature selection considered credibility, thematic relevance, and publication year (particularly from 2019-2024).

The data was then analyzed thematically, grouping findings from various sources into several main categories: (1) the contribution of technopreneurship to digital competence, (2) digital presentation skills as a form of applied digital literacy, (3) the synergy between the two in the context of secondary education, and (4) challenges and best practices in implementation.

With this approach, this article aims to provide a systematic, reflective, and in-depth understanding of the dual role of technopreneurship and presentation skills in shaping students' digital competencies holistically.

Result and Discussion

Technopreneurship in Secondary Education: Conceptual Foundations

Technopreneurship is a form of traditional entrepreneurship that combines business aspects with digital technology to produce sustainable innovation. In the context of secondary education, this approach aims not only to produce young entrepreneurs, but also to shape a technology-based adaptive mindset.

(Ram & Ganuthula, n.d.) state that AI significantly influences digital entrepreneurship by enhancing efficiency, innovation, and providing a conceptual framework for technology-based entrepreneurship education.

Technology entrepreneurship education encourages students to think creatively, take initiative, and develop solutions to social problems with the support of technology. This supports the development of independent and effective individuals in the digital ecosystem. (Udekwe & Iwu, 2024) state that the integration of digital technology and innovation in entrepreneurship education acts as a “nexus” or catalyst, strengthening EI and student motivation through the development of innovative, proactive, and problem-solving mindsets.

The connection to digital competencies is evident in how digital entrepreneurship thinking aligns with the “problem-solving” and “digital content creation” dimensions within the DigComp framework. (Rodriguez & Lieber, 2020) found that exposure to entrepreneurship education enhances an entrepreneurial mindset, including creative thinking, initiative-taking, and problem-solving skills, which are relevant for all students, not just aspiring entrepreneurs.

Digital Presentation as Multimodal Literacy in Learning

The transformation of presentation skills into the digital realm has expanded their role from mere verbal delivery to a form of multimodal communication that integrates data visualization, digital narration, and interactive design. This ability is essential in the context of digital competence because it encompasses the strategic understanding and use of various media formats.

(Zeng et al., 2020) emphasize the importance of multimodal analysis – facial expressions, voice, body language – in presentations, as well as the role of visual/audio storytelling in enhancing emotional coherence and audience engagement in digital settings.

In line with this, (Harahap et al., 2024) note that digital storytelling, which integrates text, audio, images, and video, “creates a more engaging storytelling experience,” which is relevant for digital presentations.

Digital presentation skills require not only proficiency in using tools but also critical literacy in crafting strong, ethical, and meaningful messages. This ability enables students to become effective communicators in the digital space while enhancing awareness of copyright, data representation, and the social responsibility of the content they convey.

Digital Competence: Definitions and Pedagogical Relevance

Digital competence has become one of the essential learning outcomes in 21st-century education. The Digital Competence Framework for Citizens (DigComp) developed by the European Commission provides a comprehensive and applicable definition in the context of secondary education.

Digital competence is defined as “the confident, critical, and responsible use and engagement with digital technologies for learning, at work, and for participation in society,” encompassing a combination of knowledge, skills, and attitudes. The DigComp framework outlines five key areas:

- Information and Data Literacy,
- Communication and Collaboration,
- Digital Content Creation,
- Security,
- Problem Solving.

Marais (2023) emphasizes that digital competence encompasses the aspects of confidence, criticality, and responsibility to interact consciously with the digital world, not only technically but also metacognitively and participatively.

The difference between digital skills and digital literacy is clarified by Belshaw (2016) and reformulated in Bright (2022) as follows:

- ‘Digital skills’ = what and how digital tools are used,
- ‘Digital literacy’ = why, when, for whom, including critical considerations such as privacy and copyright.

The emphasis on critical understanding, ethics, and social reflection makes digital competence not merely a technical tool but a core component of character and life skills in the digital age. True digital literacy enables students not only to be users of technology but also conscious and responsible decision-makers in the digital world.

Table 1: Key Dimensions of Digital Competence (Based on the DigComp Framework)

Dimension	Description (according to DigComp)	Relevance to Secondary Education
Information and Data Literacy	Articulating information needs, finding and retrieving data, information, and digital content. Assessing the relevance of sources and content. Storing, managing, and organizing data, information, and digital content.	Equipping students with effective digital research skills, credible source evaluation, and structured information management for academic assignments and entrepreneurial projects.
Communication and Collaboration	Interact, communicate, and collaborate through digital technology while recognizing cultural and generational diversity. Participate in society through public and private digital services and participatory citizenship. Manage one's digital presence, identity, and reputation.	Developing students' ability to work in virtual teams, communicate effectively on digital platforms, and participate responsibly in online communities is important for collaborative projects and presentations.
Digital Content Creation	Creating and editing digital content. Enhancing and integrating information and content into existing knowledge bases while understanding how copyright and licensing should be applied. Knowing how to provide understandable instructions to computer systems.	Empower students to produce multimedia presentations, digital prototypes, and marketing materials for their tech entrepreneurship ideas, with an understanding of digital ethics and intellectual property.
Security	Protecting devices, content, personal data, and privacy in the digital environment. Protecting physical and psychological health, and recognizing digital technology for social well-being and social inclusion. Recognizing the environmental impact of digital technology and its use.	Instilling safe and ethical digital practices, protecting students from cyber threats, and ensuring responsible online behavior, which is especially important when exploring entrepreneurial ventures.
Problem Solving	Identify needs and problems, and solve conceptual and situational problems in the digital environment. Use digital tools to innovate processes and products. Keep up with digital evolution.	Encouraging the innovative mindset necessary for technological entrepreneurship, enabling students to identify challenges, design digital solutions, and continuously adapt to technological advances.

Technopreneurship as a Driver of Digital Competence

Technology entrepreneurship education at the secondary level has a direct contribution to the development of in-depth digital skills. Through activities such as business idea development and pitch simulations, students are actively involved in a learning process that integrates theory and practice in a balanced manner. Such training not only strengthens entrepreneurial competencies but also builds students' confidence in effectively communicating their ideas (Premananda, 2023). The approach used includes group discussions, project development, and idea presentations, thereby creating a holistic and contextual learning experience (Premananda, 2023).

An entrepreneurial mindset encompasses a spirit of innovation, the courage to take risks, and social sensitivity to create value through beneficial solutions (Premananda, 2023). Early exposure to entrepreneurial concepts and practices encourages students to develop a more independent and responsible future orientation (Premananda, 2023). Digital simulations enable students to translate abstract concepts into real-world problem-solving while practically strengthening their digital competencies.

An entrepreneurial mindset that emphasizes courage, innovation, and perseverance aligns with the principles of confident, critical, and responsible technology use as outlined in the digital competency

framework. This underscores that technology entrepreneurship education implicitly builds adaptive and reflective digital character.

A study by (Hsieh & Maritz, 2023) shows that integrating digital technology into entrepreneurship education enhances students' motivation, collaboration, and independent learning through a multimedia approach. (Lindberg & Vesterinen, 2021) demonstrate that using ERP-based business simulations (SAP ERPsim) significantly improves students' understanding of business concepts and technical skills. (D. Chen et al., 2015) add that serious games develop competencies such as opportunity identification, risk management, and strategic thinking.

These simulations create personalized learning paths and encourage real-time decision-making – key factors in strengthening authentic digital skills. (Yang et al., 2022) also show that virtual simulations promote the development of creativity, problem-solving, and critical thinking. Additionally, the teamwork and self-efficacy fostered enhance student engagement in the learning process. (Shabbir & Pallares-Venegas, 2024) emphasize that business plan simulations bridge theory and practice, strengthening applied digital competencies.

The Role of Teachers and Learning Environment

Teachers have a central role in the implementation of technological entrepreneurship, where teachers' digital competence (TDC) is an indispensable foundation. The quality of teaching will be significantly influenced by how well teachers can understand and utilize technology in the learning process (Domínguez-González et al., 2025a). Without adequate mastery of TDC, teachers will not be able to effectively guide students in technology-based learning.

Continuous training is key to ensuring that teachers can adapt to digital developments and deliver material in a relevant and inspiring way (Domínguez-González et al., 2025b). Teachers' digital competencies include technical and pedagogical skills, as well as the strategic integration of technology into learning. The COVID-19 pandemic has further emphasized this need, driving a rapid and comprehensive transformation of teaching approaches.

Despite challenges such as administrative burdens and resource constraints, many teachers recognize the benefits of technology in improving communication with parents and supporting collaborative learning (Domínguez-González et al., 2025c). Therefore, tailored training programs supported by a collaborative culture are highly recommended. Beyond mere training, technology entrepreneurship leadership also emphasizes the importance of teamwork between teachers and students. When technology is meaningfully integrated, collaboration and the exploration of innovative solutions together are fostered (Rahmawati et al., 2024a).

Presentation Skills as Catalysts of Digital Literacy

Digital presentation skills have become an important element in innovation communication. (Harahap et al., 2024) shows that digital storytelling increases audience engagement and creates a strong narrative through a combination of visual, audio, and interactive elements. This skill requires critical literacy in composing relevant and meaningful messages across media.

Digital storytelling also strengthens students' receptive and productive skills (Shahid & Khan, 2022). Students engage in information seeking, writing, editing, and constructing visual stories that enrich information literacy and ICT competencies. (Kirk & Corti, 2020) highlight the role of data visualization in training analytical thinking and evidence-based decision-making. (Shao et al., 2024) found that data storytelling improves the efficiency and effectiveness of information comprehension compared to conventional visualization. (Gocen Kabaran & Duman, 2021) demonstrated that digital storytelling also enhances students' learning strategies, including concentration and selection of main ideas (Yu & Zadorozhnyy, 2022).

Technology Integration in Presentation Practice and Evaluation

Presentation evaluation is no longer limited to conventional methods. Video recordings, digital platforms, and social media have become part of evaluative practices that simultaneously build students' digital competencies (Suroto et al., 2023). Online platforms enable real-time communication and digital feedback, strengthening interaction and reflection. The use of social media and digital games also creates collaborative spaces that enrich students' learning and digital participation (Suroto et al., 2023).

The Synergy of Technopreneurship and Digital Presentation

When technological entrepreneurship and presentation skills are combined, they create a pedagogical synergy that strengthens comprehensive mastery of digital competencies (Premananda, 2023). (Shabbir & Pallares-Venegas, 2024) show that project-based simulation reduces the gap between theory and practice. Programs such as Young Founders League, MIT LaunchX, and B-BAY provide authentic experiences in pitching ideas to investors.

(Alharbi, 2022) emphasizes that: “Entrepreneurial pitch competitions in educational contexts facilitate the integration of digital content creation, critical communication, problem-solving, and data literacy, providing an authentic context for applying digital competence holistically.”

These digital simulations and competitions enable the simultaneous application of communication and entrepreneurial skills in real-world contexts. (Dellermann, n.d.) also highlights the role of simulation platforms in training market research, business plan writing, and collaborative digital presentations.

Educational Impact and Future Readiness

The integration of these two domains has a broad impact on student learning outcomes and career readiness. (Hammoda, 2024) notes that technology accelerates innovation and expands the job market. (Mishu et al., 2023) emphasizes that online presentations reduce student anxiety and increase self-confidence. (Alharbi, 2022) also mentions that digital pitches enhance communication, online collaboration, and digital leadership.

Business simulations like ERPsim strengthen student engagement and decision-making skills (Lindberg & Vesterinen, 2021). Teachers are also transforming into facilitators of collaborative and innovative learning. Technopreneurship-based programs equip students with 21st-century competencies, career readiness, and contributions to digital economic development (Ni et al., 2022).

(Motta & Galina, 2023) emphasize that experiential learning enhances resilience, creativity, and problem-solving. A study (Shabbir & Pallares-Venegas, 2024) supports that business simulations expand students' readiness for further education and the workforce.

The impact is not only technical but also social and economic. (Kalvakolu & Kraft, n.d.) show that VR field trips enhance collaboration and digital literacy. (Ismiati, 2024) adds that project-based STEAM learning promotes the mastery of 21st-century skills through an integrated interdisciplinary approach.

Implementation Challenges and Best Practices

The implementation of technology entrepreneurship and the development of digital presentation skills in secondary education faces various structural and cultural challenges. One of the main obstacles is teacher digital competence (TDC). Although many teachers understand the potential of technology-based education, they are often burdened by administrative tasks, pressure to communicate with parents and colleagues, and limited supporting resources. The COVID-19 pandemic has further highlighted the need to strengthen TDC, as teachers were forced to adopt digital tools in a short period to ensure the continuity of learning.

However, on the other hand, students also face behavioral challenges, such as the tendency to associate digital tools solely with entertainment, potentially leading to the misuse of devices intended for educational purposes (Domínguez-González et al., 2025a).

In addition to human factors, infrastructure limitations are also a significant obstacle. Not all institutions have adequate devices to support digital activities, and low internet connectivity hinders online learning (Arifin et al., 2024). Many teachers also lack sufficient digital literacy to effectively design technology-based learning (Arifin et al., 2024). Popular digital applications like Canva also have feature limitations in their free versions, which are often used in schools (Triana Syafitri, 2023).

Meanwhile, rapid technological advancements pose additional challenges, including a gap in understanding between new technologies and established formal learning practices (Mayes et al., 2015). Ethical issues such as privacy, digital security, and equitable access to technology further complicate the design of fair and sustainable digital learning (Mayes et al., 2015). The lack of long-term empirical studies on the impact of these implementations also makes it difficult to generalize the results (Mayes et al., 2015).

Digital divides in both access and competence have the potential to deepen educational inequality. Therefore, the successful implementation of technology entrepreneurship education and digital presentation skills requires a systemic approach that encompasses technological, pedagogical, policy, and social dimensions.

To address these challenges, various best practices have proven effective in supporting program implementation. Continuous teacher training through Massive Open Online Courses (MOOCs), webinars, and collaborative learning communities is a crucial strategy (Domínguez-González et al., 2025a). Personalized training programs based on teachers' real needs are considered to enhance student learning effectiveness (Domínguez-González et al., 2025a).

Technological entrepreneurial leadership at the school level is also a key factor. This includes strengthening information literacy, strategically adopting technology, and fostering a culture of sustainable innovation (Rahmawati et al., 2024b). Such leadership encourages teachers to design creative teaching approaches that are responsive to technological changes and based on collaboration (Rahmawati et al., 2024a).

In the context of evaluation and assessment, (González-Prida et al., 2024) shows that integrating entrepreneurship education into cross-curricular programs can enhance students' creativity, entrepreneurial mindset, and critical thinking.

Case study methods and problem-based learning remain leading approaches in innovative education, as they train students in analytical thinking, decision-making, and effective communication of ideas. The implementation of such programs must be supported by curriculum reform, infrastructure support, and comprehensive teacher capacity building. The OECD (2023) emphasizes the importance of continuous training, such as MOOCs and peer-learning, to help teachers adapt to technological changes progressively.

Critical Synthesis and Educational Implications

The integration of technological entrepreneurship and digital presentation skills in secondary education forms a transformative pedagogical strategy in building deep and applicable digital competencies.

The synergy between entrepreneurship and digital presentation is not merely an additional strategy, but rather the main foundation for the formation of comprehensive digital literacy. For example, a technology entrepreneurship pitch scenario requires students to integrate innovative thinking, problem-solving, digital content production, and persuasive communication into a single learning activity (Premananda, 2023). This reflects the core elements of digital competencies according to DigComp: information and data literacy, communication and collaboration, digital content creation, security, and problem-solving.

(Yang et al., 2022) show that virtual simulation games in entrepreneurship education significantly enhance student engagement and practical entrepreneurial skills. This reinforces evidence that digital simulations provide a real bridge between theory and practice in 21st-century education.

(Sampson et al., 2025) emphasize that the education system must integrate digital competencies, AI literacy, and STEAM principles into the formal curriculum from an early stage to shape graduates who

are resilient in the digital age. They call for computer science and technology education to be systematic and cross-level rather than sporadic.

In addition to curriculum updates, investment in teacher professional development is crucial. Teachers need to be equipped with adequate pedagogical and technical competencies to facilitate project-based learning, simulations, and digital collaboration (Rahmawati et al., 2024a). The role of school leadership is central in ensuring the availability of resources, facilitating cultural change, and building a fair and inclusive digital learning ecosystem.

Of course, various obstacles still loom, ranging from the digital divide to teacher readiness (Arifin et al., 2024). However, with collaboration across sectors, including government, industry, and the education community, these challenges can be overcome gradually. Further research can explore the long-term impact of this integration on students' career paths and refine contextual digital competency measurement tools. Case studies of successful cross-regional implementation will also provide a strong empirical foundation for policy replication.

References

- Alharbi, B. (2022). SAUDI TEACHERS' KNOWLEDGE OF CRITICAL THINKING SKILLS AND THEIR ATTITUDES TOWARDS IMPROVING SAUDI STUDENTS' CRITICAL THINKING SKILLS. *Problems of Education in the 21st Century*, 80(3), 395–407. <https://doi.org/10.33225/pec/22.80.395>
- Arifin, Z. B., Farkhan, M. N., Tasjuddin, M. R., Rahmadhani, S. A., & Salsabila, U. H. (2024). Digital Literacy as a Fundamental Competency in the 21st Century Education. *Linguanusa Social Humanities, Education and Linguistic*, 2(3), 18–32. <https://linguanusa.com>
- Chen, D., Mennecke, B. E., & Marra, R. M. (2015). Exploring the learning effects of ERP simulations: Enjoyment, cognitive appraisal, and performance. *Journal of Information Systems Education*, 26(1), 67–76.
- Chen, L., Ifenthaler, D., & Yau, J. Y.-K. (2021). Online and blended entrepreneurship education: a systematic review of applied educational technologies. *Entrepreneurship Education*, 4(2), 191–232. <https://doi.org/10.1007/s41959-021-00047-7>
- Dellermann, D. (n.d.). *Accelerating Entrepreneurial Decision-Making Through Hybrid Intelligence*.
- Domínguez-González, M. de los Á., Luque de la Rosa, A., Hervás-Gómez, C., & Román-Graván, P. (2025a). Teacher digital competence: Keys for an educational future through a systematic review. In *Contemporary Educational Technology* (Vol. 17, Issue 2). Bastas. <https://doi.org/10.30935/cedtech/16168>
- Domínguez-González, M. de los Á., Luque de la Rosa, A., Hervás-Gómez, C., & Román-Graván, P. (2025b). Teacher digital competence: Keys for an educational future through a systematic review. In *Contemporary Educational Technology* (Vol. 17, Issue 2). Bastas. <https://doi.org/10.30935/cedtech/16168>
- Domínguez-González, M. de los Á., Luque de la Rosa, A., Hervás-Gómez, C., & Román-Graván, P. (2025c). Teacher digital competence: Keys for an educational future through a systematic review. In *Contemporary Educational Technology* (Vol. 17, Issue 2). Bastas. <https://doi.org/10.30935/cedtech/16168>
- Gocen Kabaran, G., & Duman, B. (2021). The Effect of Digital Storytelling Method on Learning and Study Strategies. *International Journal of Technology in Education*, 4(4), 681–694. <https://doi.org/10.46328/ijte.83>
- González-Prida, V., Sandoval-Trigos, J. C., Moreno-Menéndez, F. M., Gomez-Bernaola, K. O., Tello-Porras, D. A., & Pariona-Amaya, D. (2024). Fostering Entrepreneurial Mindsets: Factors Shaping Student Intentions in a Challenging Economic Landscape. *Societies*, 14(10). <https://doi.org/10.3390/soc14100202>
- Hammoda, B. (2024). The impact of educational technologies on entrepreneurial competencies: A systematic review of empirical evidence. *Knowledge Management and E-Learning*, 16(2), 309–333. <https://doi.org/10.34105/j.kmel.2024.16.015>
- Harahap, T. R., Nasution, B., Nasution, F., & Harahap, A. N. (2024). Digital Narratives: The Evolution of Storytelling Techniques in the Age of Social Media. *International Journal of Educational Research Excellence (IJERE)*, 3(2), 738–745. <https://doi.org/10.55299/ijere.v3i2.1004>
- Hsieh, H.-M., & Maritz, A. (2023). A Study of the Impact of the Application of Digital Technology-Integrated Entrepreneurship Education on Entrepreneurship and Entrepreneurial Performance. *International Journal of Emerging Technologies in Learning (IJET)*, 18(20), 126–136. <https://doi.org/10.3991/ijet.v18i20.43907>
- Ismiati, N. (2024). Implementing STEAM education in the independent curriculum: Enhancing 21st century skills. *Tadibia Islamika*, 4(1), 21–27. <https://doi.org/10.28918/tadibia.v4i1.7238>

- Kalvakolu, S., & Kraft, E. (n.d.). *Educational Virtual Field Trips based on Social VR and 360° Spaces*.
- Kirk, A., & Corti, K. (2020). The value of data storytelling in education. *Journal of Data Literacy*, 3(2), 20–35.
- Lindberg, I., & Vesterinen, L. (2021). The impact of serious games in economic and business education: A case of ERP business simulation. *International Journal of Game-Based Learning*, 11(3), 42–58. <https://doi.org/10.4018/IJGBL.20210701.oa1>
- Mayes, R., Natividad, G., & Spector, J. M. (2015). Challenges for educational technologists in the 21st century. *Education Sciences*, 5(3), 221–237. <https://doi.org/10.3390/educsci5030221>
- Mishu, A., Mohammed, H. A., Hakami, S. A. A., & Chowdhury, G. (2023). The impact of online presentations on reducing the introverted EFL learners' stress and anxiety. *Saudi Journal of Language Studies*, 3(1), 32–46. <https://doi.org/10.1108/sjls-03-2022-0037>
- Motta, V. F., & Galina, S. V. R. (2023). Experiential learning in entrepreneurship education: A systematic literature review. *Teaching and Teacher Education*, 121, 103919. <https://doi.org/10.1016/j.tate.2022.103919>
- Ni, A., Sri, W., & Agoes Ganesha, R. (2022). RESEARCH OF TECHNOPRENEURSHIP UNDERSTANDING AMONG UNIVERSITY STUDENTS: A CASE STUDY IN BALI PROVINCE. *RJOAS*, 9(129). <https://doi.org/10.18551/RJOAS.2022-09.04>
- Ni Luh Putu Ning Septyarini Putri Astawa, & Ida Ayu Oka Purnami. (2024). Equipping Young Entrepreneurs: How Smart Presentation Apps Foster Vocational High-School Students' Innovation. *International Journal of Community Service Learning*, 8(2), 140–148. <https://doi.org/10.23887/ijcsl.v8i2.78338>
- Premananda, N. L. P. U. (2023). High School Students with Digital Era Entrepreneurship Skills: A Basic Training Approach. *Jurnal Karya Abdi Masyarakat*, 7(2), 101–108. <https://doi.org/10.22437/jkam.v7i2.10183>
- Rahmawati, I., Lestari, H., Herlina, B., Trimulyo, J., & Awaludin, M. R. (2024a). *Development of Technopreneur Leadership to Improve High School Teachers' Teaching Performance: Innovative Approaches in Education* (Vol. 1, Issue 1).
- Rahmawati, I., Lestari, H., Herlina, B., Trimulyo, J., & Awaludin, M. R. (2024b). *Development of Technopreneur Leadership to Improve High School Teachers' Teaching Performance: Innovative Approaches in Education* (Vol. 1, Issue 1).
- Rodriguez, S., & Lieber, H. (2020). Relationship Between Entrepreneurship Education, Entrepreneurial Mindset, and Career Readiness in Secondary Students. *Journal of Experiential Education*, 43(3), 277–298. <https://doi.org/10.1177/1053825920919462>
- Sampson, D., Kampylis, P., Moreno-León, J., & Bocconi, S. (2025). Towards high-quality informatics K-12 education in Europe: key insights from the literature. *Smart Learning Environments*, 12(1). <https://doi.org/10.1186/s40561-025-00366-5>
- Shabbir, S., & Pallares-Venegas, J. (2024). Enhancing students' business plan learning through experiential business plan simulation. *Entrepreneurship Education Journal*, 8(1), 11–29.
- Shahid, M., & Khan, M. R. (2022). Use of Digital Storytelling in Classrooms and Beyond. *Journal of Educational Technology Systems*, 51(1), 63–77. <https://doi.org/10.1177/00472395221112599>
- Shao, H., Martinez-Maldonado, R., Echeverria, V., Yan, L., & Gašević, D. (2024, May 11). Data Storytelling in Data Visualisation: Does it Enhance the Efficiency and Effectiveness of Information Retrieval and Insights Comprehension? *Conference on Human Factors in Computing Systems - Proceedings*. <https://doi.org/10.1145/3613904.3643022>
- Suroto, Sunyono, Haenilah, E. Y., Hariri, H., Pargito, & Trenggono, N. (2023). Evaluation of Presentation Skills in the Context of Online Learning: A Literature Review. In *International Journal of Information and Education Technology* (Vol. 13, Issue 5, pp. 855–860). International Journal of Information and Education Technology. <https://doi.org/10.18178/ijiet.2023.13.5.1879>
- Triana Syafitri, D. (2023). ELT-Lectura: Studies and Perspectives in English Challenges and Strategies of Teachers in Integrating Canva in English Classroom Teaching. *ELT-Lectura*, 10(1).
- Udekwe, E., & Iwu, C. G. (2024). The Nexus Between Digital Technology, Innovation, Entrepreneurship Education, and Entrepreneurial Intention and Entrepreneurial Motivation: A Systematic Literature Review. In *Education Sciences* (Vol. 14, Issue 11). Multidisciplinary Digital Publishing Institute (MDPI). <https://doi.org/10.3390/educsci14111211>
- Yang, Q., Zhang, Y., & Lin, Y. (2022). Study on the Influence Mechanism of Virtual Simulation Game Learning Experience on Student Engagement and Entrepreneurial Skill Development. *Frontiers in Psychology*, 12. <https://doi.org/10.3389/fpsyg.2021.772157>

- Yu, B., & Zadorozhnyy, A. (2022). Developing students' linguistic and digital literacy skills through the use of multimedia presentations. *ReCALL*, 34(1), 95–109. <https://doi.org/10.1017/S0958344021000136>
- Zeng, H., Wang, X., Wu, A., Wang, Y., Li, Q., Endert, A., & Qu, H. (2020). EmoCo: Visual analysis of emotion coherence in presentation videos. *IEEE Transactions on Visualization and Computer Graphics*, 26(1), 927–937. <https://doi.org/10.1109/TVCG.2019.2934656>
- Zhang, Z. (2021). *The Impact of Digital Technologies on Entrepreneurship Education A Literature Review for Progress and Prospects*.