International Journal of Environmental Sciences
ISSN: 2229-7359
Vol. 11 No. 1s, 2025
https://www.theaspd.com/ijes.php

Sustainable Education Systems: A Future Vision for Developing Higher-Order Thinking Abilities

Abdellah Ibrahim Mohammed Elfeky[1]*, Mohammed Salah-Eldin Abdel-Aziz Hassanein[2], Amal Zayed[3], Yassine Mohammed Khalladi[4] and Marwa Yasien Helmy Elbyaly[5]
[1]Department of Curriculum and Instruction, College of Education, Najran University, Najran, Saudi Arabia
[2]Department of Administrative Sciences, Applied College, Najran University, Najran, Saudi Arabia
[3]Educational Psychology Department, Faculty of Education, Kafrelsheikh University, Kafr El-Sheikh 33516, Egypt
[4]Assistant Professor, Faculty of Education and Arts Sohar University Sultanate of Oman
[4]Assistant Professor, Department of Music and Musicology, Higher Institute of Music University of Sousse Republic of Tunisia
[5]Department of Home Economics, Faculty of Specific Education, Kafrelsheikh University, Egypt

[1]abdalah.elfeqi@spe.kfs.edu.eg, [2]mshassanein@nu.edu.sa, [3]amal.zayed@edu.kfs.edu.eg, [4]YKhalladi@su.edu.om and [5]Marwa.mohamed1@spe.kfs.edu.eg
[1]https://orcid.org/my-orcid?orcid=0000-0001-9208-8537, [2]https://orcid.org/my-orcid?orcid=0000-0001-9208-8537 and [5]https://orcid.org/my-orcid?orcid=0000-0001-5521-8494

ABSTRACT
Sustainable education systems based on developments in educational design for design variables specific to educational technology still occupy a large space in research priorities in many classified scientific journals, and among these variables augmented reality. In addition, educational data mining, intelligence applications in education, learning analytics, digital platforms, gamification, flipped learning/classroom, video-based learning, computer-based assessment, social networks, and psychological variables in the design of educational technologies.

Keywords: *sustainable education systems; future vision; higher-order thinking abilities*

INTRODUCTION
It may be important to develop undergraduate and graduate curricula that include topics related to educational technology innovations based on generative artificial intelligence, the Internet of Things, and other priority topics [1]. Include courses that promote international publishing in the field of educational technology [2]. Develop approved lists of technological and research competencies that should be enhanced and mastered across curricula [3-5].

It may be important to expand the launch of interdisciplinary programs in partnership between educational technology departments and other departments related to the specialization, as interdisciplinary specializations are one of the global trends for developing scientific specializations [6-9]. In this context, it is possible to consider launching interdisciplinary programs as follows: Educational Technology and Artificial Intelligence (in partnership between the Educational Technology Department and one of the departments of Artificial Intelligence) [10-12]. Digital Curricula (in partnership between the Educational Technology Department and one of the departments of Curricula and Teaching Methods) [13, 14]. Digital Art Techniques (in partnership between the Educational Technology Department and one of the departments of Art Education) [15, 16].

It is important to develop qualitative research maps for the field that represent the first start and the basic intellectual vision for the field's trends in the coming period, with experts in the field participating in developing these maps, taking into account the most important hot topics in the field. The most important

fields and topics with the highest citations in the field [17-20]. National priorities for developing the educational structure in the context of digital technology [21, 22].

Develop databases that enhance the research performance of researchers in the field of educational technology, for example, databases of internationally influential researchers. Lists of the most influential journals in the top quartile of databases. Databases of research priority issues [23-25]. Databases of hot papers in specific fields. Databases of papers ranked within the range of the most influential papers [26].

Partnerships with world-class universities to offer joint study programs may be one of the developmental solutions that help develop the field according to qualitative global practices that enhance the performance of the educational technology specialization [27]. This can be initiated through short diploma programs, or specialized master's programs in a specific technology [28]. It is also possible to work on launching study programs through the distance education system through which joint teaching is carried out [29].

Coordinating with educational technology associations to continue their active role in developing quality programs to enhance international publishing in the field of educational technology [30]. Working to transform their affiliated journals into journals classified within global databases [31]. Expanding the formation of specialized research groups. Expanding digital presence across networks and developing sustainable development plans and activities [32].

Generative AI

Generative AI is a high priority in educational technology research now. A large number of international journals have devoted special issues to generative AI research [33]. The issue of reconsidering the educational design processes for the use of generative AI tools is a priority so that the educational design is directed to the processes that occur when using AI tools and not the final product [34].

Internet of Things in Education

The use of the Internet of Things in education is one of the research topics that occupies a large space in the international arena. Internet of Things research is working to achieve a breakthrough in terms of the infrastructure of materials and technologies used in the educational process. In addition, how the community and spatial environment can be transformed into an integrated educational environment that enhances the learning process [35].

Subscription-Based Model for Learning

Subscription-Based Model for Learning Similar to major global networks - for example, Netflix - OSN - which have moved towards developing digital platforms that provide multiple digital media that allow the user, in return for a monthly subscription, to choose what he wants to watch and interact with without any restrictions related to the type of content, place or time. Research in the field of educational technologies is currently expanding in the development of digital platforms that provide educational content and training courses based on the idea of subscriptions (monthly/quarterly/annually) [36]. The number or type of content that the user wants to interact with, which supports the systems of, does not restrict that: continuous learning, lifelong learning, and digital professional development.

Digital and Comprehensive Online Assessments

Digital and Comprehensive Online Assessments is one of the research trends that aims to enhance and expand the capabilities of digital assessment. That research in this field reaches specifications for conducting all types of traditional tests digitally without any restrictions by developing digital tools and platforms that can be relied upon to implement oral and practical tests. In addition, integrating the learner's audio files with current testing systems so that the learner's analyses and explanations can be heard and a comprehensive evaluation of his answer can be given [37].

Digital Citizenship Techniques

Although digital citizenship has been a topic of scientific research for nearly ten years, studying digital citizenship as a hot topic requires a shift from studying stereotypical topics such as (password protection,

respect for privacy, etc.) to studying (mechanisms for enabling students to use digital resources through various technological innovations). This is done through multiple research areas, including [38]:

- Using tools to manage multiplicity of viewpoints and enhance digital interactions in the learning environment.
- Mechanisms for evaluating digital media and social participation in the learning environment.
- Mechanisms for using digital tools within educational environments to solve problems of growing societal problems.
- Using tools to enhance mental health and positive psychology variables across learning environments.

Online Learning Design

Online learning design is one of the main topics that have been worked on during the past ten years, but within the framework of the variables of the almost complete shift to distance learning, work on studying the design variables of online educational environments must focus on [39]:

- Tools to reduce the cognitive load in online learning environments.
- Tools for intelligent and adaptive support in online learning environments.
- Tools to enhance social interaction in online learning environments.

Digital Technologies that Promote Access and Equality

In the context of the variables associated with the Covid-19 pandemic and the Fourth Industrial Revolution, learning has completely shifted to the Internet. However, this shift has resulted in some groups being unable to obtain appropriate learning opportunities, either because they do not have the capabilities to participate in the new educational environment or because they have special needs, among other reasons. Accordingly, the following are important areas that educational technology research should focus on in this context [40]:

- Proposed models for employing learning management systems to achieve digital equity.
- Models for managing distance learning environments in poor and marginalized environments.
- Managing digital access processes for people with special needs through distance learning environments.

Social-emotional learning techniques

Social-emotional learning techniques this field focuses on how to manage emotions within the educational environment, build positive relationships, and enhance the climate that supports the learning process through digital learning environments. Here, educational technology research in this context should focus on the following [41]:

- Using educational technology tools and innovations to enhance and manage social-emotional learning.
- Design variables for online learning environments and their impact on social-emotional learning.

Diversity in research methodologies

Studying educational technology from different methodological perspectives, where the researcher monitored the use of the following methodologies in educational technology treatments, including for example [42]:

- Mixed research
- Systematic review research
- Bibliometric research
- Qualitative research (phenomenological approach)

CONCLUSION

Studying educational technology from different methodological angles, where the researcher monitored the use of the following methodologies in educational technology treatments, including, for example, mixed research, systematic review research, bibliometric research, and qualitative research (phenomenological approach).

ACKNOWLEDGMENT

The authors are thankful to the Deanship of Graduate Studies and Scientific Research at Najran University for funding this work under the Growth Funding Program grant code (NU/GP/SEHRC/13/49-3).

REFERENCES

1. Elfeky, A.I.M., A.H. Najmi, and M.Y.H. Elbyaly, *Effects of Big Data Analytics in Learning Management Systems for Improving Learners' Academic Success.* Profesional de la información, 2024. **33**(1).
2. Elfeky, A.I.M., T.S.Y. Masadeh, and M.Y.H. Elbyaly, *Advance organizers in flipped classroom via e-learning management system and the promotion of integrated science process skills.* Thinking Skills and Creativity, 2020. **35**: p. 100622.
3. Elfeky, A.I.M. and T.S.Y. Masadeh, *The Effect of Mobile Learning on Students' Achievement and Conversational Skills.* International Journal of higher education, 2016. **5**(3): p. 20-31.
4. Elfeky, A.I.M. and M.Y.H. Elbyaly, *The effectiveness of virtual classrooms in developing academic motivation across gender groups.* Ann. For. Res, 2023. **66**(1): p. 2005-2020.
5. Elfeky, A.I.M. and M.Y.H. Elbyaly, *The Impact Of Virtual Classrooms On The Development Of Digital Application Skills Among Teachers Of Digital Skills In Najran Region.* Ann. For. Res, 2023. **66**(1): p. 2044-2056.
6. Elfeky, A.I.M. and M.Y.H. Elbyaly, *Examining The Effects Of Virtual Classroom Use Inside Learning Management Systems On Enhancing Student Satisfaction.* Ann. For. Res, 2023. **66**(1): p. 1980-1990.
7. Elfeky, A.I.M. and M.Y.H. Elbyaly, *The Impact Of Project-Based Learning On The Development Of Cognitive Achievement In The Course Of Applications In Educational Technology Among Students Of The College Of Education At Najran University.* European Chemical Bulletin, 2023. **12**: p. 6643-6648.
8. Elfeky, A.I.M. and M.Y.H. Elbyaly, *MANAGING DRILL AND PRACTICE PROGRAMS WITH A MOTIVATIONAL DESIGN AND THEIR EFFECTS ON IMPROVING STUDENTS'ATTITUDES TOWARD INFORMATION AND COMMUNICATION TECHNOLOGY COURSES.* European Chemical Bulletin, 2023. **12**: p. 6567-6574.
9. Elfeky, A.I.M. and M.Y.H. Elbyaly, *The Effect of Simulation Programs On Enhancing Skills Of Digital Applications.* European Chemical Bulletin, 2023. **12**: p. 6588-6594.
10. Elfeky, A.I.M. and M.Y.H. Elbyaly, *The Impact of Mobile Learning On Developing The Skills Of Integrated Science Operations Among Students Of The Optimum Investment Diploma.* European Chemical Bulletin, 2023. **12**: p. 6629-6635.
11. Elfeky, A.I.M. and M.Y.H. Elbyaly, *The use of data analytics technique in learning management system to develop fashion design skills and technology acceptance.* Interactive Learning Environments, 2023. **31**(6): p. 3810-3827.
12. Elfeky, A.I.M. and M.Y.H. Elbyaly, *The Effect Of E-Tutorial Programs On Improving The Producing Digital Content Skill.* European Chemical Bulletin, 2023. **12**: p. 6581-6587.
13. Elfeky, A.I.M. and M.Y.H. Elbyaly, *Developing skills of fashion design by augmented reality technology in higher education.* Interactive Learning Environments, 2021. **29**(1): p. 17-32.

14. Elfeky, A.I.M. and M.Y.H. Elbyaly, *Multimedia: different processes.* Interactive multimedia-multimedia production and digital storytelling, 2019.
15. Elfeky, A.I.M. and M.Y.H. Elbyaly, *The impact of learning object repository (lor) in the development of pattern making skills of home economics students.* British Journal of Education, 2016. **4**(2): p. 87-99.
16. Elbyaly, M.Y.H. and A.I.M. Elfeky, *The Effectiveness Of Project-Based Learning On Enhancing The Critical Thinking Skills Of Optimal Investment Students.* Annals of Forest Research, 2023. **66**(1): p. 1595-1606.
17. Elfeky, A.I.M., S.M. Alharbi, and E.S.A.H. Ahmed, *The effect of project-based learning in enhancing creativity and skills of arts among kindergarten student teachers.* Journal of Positive School Psychology, 2022. **6**(8): p. 2182-2191.
18. Elfeky, A.I.M., *The effect of personal learning environments on participants' higher order thinking skills and satisfaction.* Innovations in Education and Teaching International, 2018.
19. Elfeky, A.I.M., *The use of CSCL environment to promote students' achievement and skills in handmade embroidery.* Journal of Home Economics, 2016. **26**(3).
20. Elfeky, A. *Social Networks Impact factor on Students' Achievements and Attitudes towards the" Computer in Teaching" Course at the College of Education*. in *International journal on E-learning*. 2017. Association for the Advancement of Computing in Education (AACE).
21. Elbyaly, M.Y.H. and A.I.M. Elfeky, *The impact of blended learning in enhancing the skill performance of producing digital content among students of optimal investment.* Ann. For. Res, 2023. **66**(1): p. 2031-2043.
22. Elbyaly, M.Y.H. and A.I.M. Elfeky, *The effectiveness of a program based on augmented reality on enhancing the skills of solving complex problems among students of the Optimal Investment Diploma.* Ann. For. Res, 2023. **66**(1): p. 1569-1583.
23. Elbyaly, M.Y.H. and A.I.M. Elfeky, *The Effectiveness of Employing Motivational Designed E-Learning Situations On Developing Achievement In Computer Science Curricula For Optimal Investment Students.* European Chemical Bulletin, 2023. **12**: p. 6595-6602.
24. Elbyaly, M.Y.H. and A.I.M. Elfeky, *The Efficiency of Instructional Gaming Programs In Stimulating Creative Thinking.* European Chemical Bulletin, 2023. **12**: p. 6613-6621.
25. Elbyaly, M.Y.H. and A.I.M. Elfeky, *The Efficiency of Online Learning Environments In Fostering Academic Motivation.* European Chemical Bulletin, 2023. **12**: p. 6622-6628.
26. Elbyaly, M.Y.H. and A.I.M. Elfeky, *The Effectiveness of Using Advanced Organizations Within The Virtual Classroom To Enhance The Acceptance Of Technology During Disasters.* European Chemical Bulletin, 2023. **12**: p. 6603-6612.
27. Elbyaly, M.Y.H. and A.I.M. Elfeky, *Collaborative E-Learning Environment: Enhancing The Attitudes Of Optimal Investment Diploma Students Towards The Digital Skills Course.* European Chemical Bulletin, 2023. **12**: p. 6552-6558.
28. Elbyaly, M.Y.H. and A.I.M. Elfeky, *The Impact of Problem-Solving Programs In Developing Critical Thinking Skills.* European Chemical Bulletin, 2023. **12**: p. 6636-6642.
29. Elbyaly, M.Y.H. and A.I.M. Elfeky, *Flipped Classroom: Enhancing Fashion Design Skills For Home Economics Students.* learning, 2023. **4**: p. 7.

30. Elbyaly, M.Y.H. and A.I.M. Elfeky, *The Effect Of A Simulation Program On Students At The College Of Education's Acquisition Of Hand Embroidery Skills.* European Chemical Bulletin, 2023. **12**: p. 6575-6580.

31. Elbyaly, M.Y.H. and A.I.M. Elfeky, *Investigating the effect of vodcast to enhance the skills of the Canadian smocking and complex problem solving.* Current Psychology, 2022. **41**(11): p. 8010-8020.

32. Elbyaly, M.Y.H. and A.I.M. Elfeky, *The role of metacognition in promoting deep learning in MOOCs during COVID-19 pandemic.* PeerJ Computer Science, 2022. **8**: p. e945.

33. Elbyaly, M.Y.H., *Heritage Revival by the Use of Saudi Bedouin Textiles in the Gulf Mantle.* Journal of Home Economics, 2016. **26**(4): p. 127-143.

34. Elbyaly, M. and E. El-Fawakhry, *Online teaching course to develop STUDENTS'CREATIVITY in handmade embroidery.* British Journal of Education, 2016. **4**(13): p. 30-51.

35. Elbourhamy, D.M., A.H. Najmi, and A.I.M. Elfeky, *Students' performance in interactive environments: an intelligent model.* PeerJ Computer Science, 2023. **9**: p. e1348.

36. Almalki, A.D.A. and A.I.M. Elfeky, *The effect of immediate and delayed feedback in virtual classes on mathematics students' higher order thinking skills.* Journal of Positive School Psychology, 2022: p. 432–440-432–440.

37. Alharbi, S.M., A.I. Elfeky, and E.S. Ahmed, *The effect of e-collaborative learning environment on development of critical thinking and higher order thinking skills.* Journal of Positive School Psychology, 2022: p. 6848-6854.

38. Ahmed, E.S.A.H., S.M. Alharbi, and A.I. Elfeky, *Effectiveness of a proposed training program in developing twenty-first century skills and creative teaching skills among female student teachers, specializing in early childhood.* Journal of Positive School Psychology, 2022: p. 4316-4330.

39. Masadeh, T.S.Y. and A.I.M. Elfeky, *Efficacy of open-source learning management systems in developing the teaching skills of English language student teachers.* American Journal of Educational Research, 2016. **4**(4): p. 329-337.

40. Masada, T.S.Y., *Immediate versus delayed feedback in promoting student teachers skills for lesson plan implementation.* Thouqan Saleem Yakoub Masadeh and Abdellah Ibrahim Mohammed Elfeky (2017) Immediate Versus Delayed Feedback in Promoting Student Teachers Skills for Lesson Plan Implementation, British Journal of Education, 2017. **5**(8): p. 43-58.

41. Elfeky, A.I.M., A.H. Najmi, and M.Y.H. Elbyaly, *The impact of advance organizers in virtual classrooms on the development of integrated science process skills.* PeerJ Computer Science, 2024. **10**: p. e1989.

42. Elfeky, A.I.M., A.H. Najmi, and M.Y.H. Elbyaly, *The effect of big data technologies usage on social competence.* PeerJ Computer Science, 2023. **9**: p. e1691.