Migration Letters

Volume: 20, No: S9(2023), pp. 863-874

ISSN: 1741-8984 (Print) ISSN: 1741-8992 (Online)

www.migrationletters.com

The Role of Artificial Intelligence Technologies in Enhancing Education and Fostering Emotional Intelligence for Academic Success

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Abstract

Background: Artificial Intelligence (AI) technologies are reshaping education, offering new avenues for enhancing teaching practices. This cross-sectional study conducted in Abha City, Saudi Arabia, investigates the interplay between AI technology usage, teaching competencies, and emotional intelligence among faculty members.

Methods: A sample of 60 faculty members was selected, and data were collected through standardized questionnaires assessing teaching competencies, emotional intelligence, and AI technology integration. Correlation analyses were performed to examine the relationships between these variables.

Results: The study reveals strong positive correlations between self-assessed teaching competencies, indicating educators' holistic approach to their roles. Furthermore, moderate positive correlations are observed between AI usage frequency and teaching competencies, highlighting AI's potential to enhance pedagogical skills. Emotional intelligence dimensions, such as empathy and social skills, also exhibit positive correlations with teaching competencies and AI usage frequency.

Conclusion: These findings underscore the multifaceted relationships among AI technologies, teaching competencies, and emotional intelligence in education. The study highlights the need for tailored professional development, effective AI integration strategies, and the cultivation of emotionally intelligent teaching practices to foster academic success.

Keywords: *Artificial Intelligence, Education, Emotional Intelligence, Academic Success.*

Introduction

The integration of artificial intelligence (AI) in education has revolutionized the learning landscape, with applications such as smart classrooms, online learning platforms, and personalized learning[1]. Smart classrooms utilize AI-powered systems to create interactive and personalized learning experiences. By analyzing data and using machine learning algorithms, these systems adapt to students' individual needs, providing targeted interventions and personalized feedback[2]. Online learning platforms leverage AI to analyze student interactions and deliver personalized content, allowing for adaptive

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learning paths tailored to each student's strengths and learning style[3]. AI technologies have also improved the scalability of education by providing on-demand assistance and reaching a larger student population, regardless of location or time constraints[4].

The benefits of AI in education are significant. Firstly, AI streamlines administrative tasks, such as grading, freeing up educators' time to focus on instruction and individualized support[5]. Secondly, AI enhances accessibility by accommodating diverse learning styles and needs, providing tailored support through assistive technologies. Lastly, AI enables scalability by extending education beyond physical classrooms, reaching a larger and more diverse student population[6]. These advantages contribute to more efficient and effective learning outcomes, ensuring that every student has the opportunity to succeed academically.

Artificial intelligence (AI) has emerged as a powerful tool in enhancing academic performance by providing personalized learning experiences tailored to the unique needs of students[3]. Through the integration of AI-driven tools and platforms, students can receive targeted support, adaptive content, and individualized feedback, ultimately leading to improved academic outcomes[7].

One significant way AI enhances academic performance is through personalized learning experiences[8]. Adaptive learning systems, for instance, utilize AI algorithms to analyze students' strengths, weaknesses, and learning patterns. Based on this analysis, these systems generate personalized learning paths, delivering content and assignments that align with each student's specific needs[9]. By catering to individual learning styles and pacing, personalized learning helps students engage more deeply with the material, leading to increased retention and comprehension[10].

AI tutors are another example of how AI can support academic achievement. These intelligent virtual tutors leverage natural language processing and machine learning to interact with students, answering questions, providing explanations, and offering guidance[11]. AI tutors can adapt their teaching strategies to match the student's level of understanding, ensuring that they receive the necessary support to overcome challenges and grasp complex concepts. The availability of AI tutors also extends learning beyond the classroom, providing students with on-demand assistance and additional resources to reinforce their knowledge[12].

Numerous studies and case studies have demonstrated the positive impact of AI on academic outcomes. For example, a study conducted by researchers at a prominent educational institution found that students who used an AI-driven adaptive learning system showed significant improvement in their performance compared to those who followed a traditional classroom approach[13]. The personalized nature of the adaptive system allowed students to progress at their own pace and receive immediate feedback, resulting in better retention and mastery of the subject matter[14].

In addition to its role in academic performance, artificial intelligence (AI) can also play a significant role in fostering emotional intelligence among students. Emotional intelligence encompasses the ability to recognize, understand, and manage one's own emotions, as well as empathize with and navigate the emotions of others[15]. By leveraging AI-powered tools and applications, educators can provide students with opportunities to develop and enhance their emotional intelligence skills[16].

One way AI can foster emotional intelligence is through the use of chatbots designed to provide emotional support. These AI-powered conversational agents can engage in empathetic and non-judgmental conversations with students, allowing them to express their emotions and concerns in a safe environment[17]. Chatbots can offer personalized guidance, coping strategies, and resources for managing emotions, thereby promoting self-awareness and emotional regulation. Through continuous interactions, students can

develop a better understanding of their emotions and build resilience in dealing with various challenges[18].

Virtual reality (VR) simulations are another powerful tool for fostering emotional intelligence. By immersing students in realistic scenarios, VR simulations allow them to experience and understand different perspectives, thus cultivating empathy and enhancing social awareness[19]. For example, VR simulations can provide students with opportunities to step into the shoes of others, such as individuals from different cultural backgrounds or individuals with specific emotional experiences[20]. This firsthand experience helps students develop empathy, compassion, and an appreciation for diversity. By combining AI algorithms with VR simulations, personalized feedback and guidance can be provided, further supporting the development of emotional intelligence skills[21].

The aim of this cross-sectional study is to investigate the relationship between the integration of artificial intelligence (AI) technologies in education and the emotional intelligence of faculty members in Abha City, Saudi Arabia, with the goal of understanding how AI can enhance education and its potential influence on teaching practices and emotional intelligence.

Method

Design

This study employed a cross-sectional design, which allowed for the collection of data from participants at a single point in time. The objective was to assess the relationship between the use of artificial intelligence (AI) technologies in education and the emotional intelligence of faculty members.

Participants

The participants in this cross-sectional study comprised faculty members from Abha City, Saudi Arabia. A total of 60 faculty members, both male and female, were randomly selected to participate in the study. Participants were drawn from various educational institutions,in king Khaled University.

Inclusion Criteria:

1. Faculty members: Participants must be currently employed as faculty members in Abha City, Saudi Arabia, in king Khaled University.

2. AI usage: the participant is in consisting of usage of AI in educating courses, for at least on education semester.

3. Consent: Participants must provide informed written consent to voluntarily participate in the study, acknowledging their understanding of the study's purpose and procedures

Data Collection Tools:

a. Emotional Intelligence Questionnaire: Participants were administered the "Emotional Intelligence Appraisal" questionnaire by Travis Bradberry and Jean Greaves. This standardized questionnaire consists of 28 items and assesses various dimensions of emotional intelligence, including self-awareness, self-regulation, motivation, empathy, and social skills The Trait Emotional Intelligence Questionnaire Short Form (TEIQue-SF), a brief and effective tool used for assessing emotional intelligence, originated in the Western culture and needs to be adapted to other culture. Reliability of the Arabic version Cronbach’s internal consistency coefficient for the overall sample ($\alpha = .89$).

b. AI Integration in Education Survey: Participants completed a survey designed to gauge their experiences and perceptions regarding the integration of AI technologies in their classrooms. The survey included items related to AI tools used, frequency of use, perceived benefits, and challenges. The survey was developed specifically for this study based on relevant literature and expert input. To assess the validity of the questionnaire, 5 professors in education were asked to evaluate the content of the questionnaire, also a pilot testing for assessing the reliability. Reliability of the survey Cronbach's internal consistency coefficient for the overall sample ($\alpha = .91$).

c. Teacher Self-assessment Instrument: The Self-assessment Instrument for Teacher Evaluation (SITE II) is a widely used tool for teacher self-assessment and evaluation. Developed by Akram, and Zepeda (2015), SITE II is based on Charlotte Danielson's Framework for Teaching. It consists of four domains: Planning and Preparation, The Classroom Environment, Instruction, and Professional Responsibilities. Within each domain, there are evaluation criteria and performance indicators that cover various aspects of effective teaching[22]. SITE II provides a structured framework for teachers to reflect on their practice, rate their performance on each indicator, provide evidence or examples of their practice, and set goals for improvement. It is often used as part of a comprehensive teacher evaluation system that includes multiple sources of evidence.

Data Analysis: The data collected will be subjected to a thorough analysis to assess the relationship between AI usage in education and emotional intelligence among faculty members. Specifically, Pearson correlation analysis will be employed to examine the strength and direction of the association between AI usage and emotional intelligence dimensions, including self-awareness, self-regulation, motivation, empathy, and social skills. Multiple regression analysis may also be utilized to explore the predictive power of AI usage on emotional intelligence while controlling for potential covariates.

Procedure:

The data collection process involved several key steps. First, faculty members in king Khaled university were randomly selected from different educational institutions. Subsequently, participants were contacted and informed about the study's objectives and procedures. Upon obtaining informed written consent from each participant, the questionnaires were administered.

Data Collection Timeline: Data collection for this study occurred between august 2023 and September 2023. The surveys were administered during this timeframe to ensure a consistent and representative sample.

Data Cleaning and Preprocessing: Following data collection, thorough data cleaning procedures were implemented. Any missing data points were addressed through appropriate imputation techniques, and outliers were identified and addressed. Data quality was ensured through checks for response consistency.

Ethical Considerations:

Ethical considerations were paramount in this study involving faculty members from king Khaled University. Informed written consent was diligently obtained from all participants, emphasizing their right to voluntary participation and confidentiality. To protect their privacy, data were anonymized and securely stored, accessible only to authorized research personnel. Participants were assured that their decision to participate or withdraw would not affect their professional status. The study's design aimed to minimize any potential harm or discomfort, and ethical approval was granted prior to commencing the research. These ethical measures ensured that the rights and well-being of the faculty members were upheld throughout the study.

Results

Table 1 offers a comprehensive overview of the demographic characteristics of the study participants, consisting of 60 faculty members in King Khaled university. Gender distribution is notably balanced, with an equal representation of male (50%) and female (50%) participants, ensuring a diverse and inclusive sample. The age range reveals a mix of early and mid-career faculty, with the majority falling within the 31-40 years category. This diversity in age contributes to a varied pool of experiences and perspectives. In terms of educational background, the participants hold diverse qualifications, with 41.6% possessing bachelor's degrees, 33.33% holding master's degrees, and 25% having obtained a PhD. The distribution of years of teaching experience is well-structured, encompassing various career stages, with a substantial representation of faculty members in the 11-15 years of experience category. This demographic snapshot provides a solid foundation for subsequent analyses, allowing for nuanced exploration of the potential impact of gender, age, educational background, and teaching experience on the integration and perception of artificial intelligence in education.

Table 1: Participant Demographics

Demographic Variable	Category	Frequency (n=60)	Percentage (%)
Gender	Male	30	50%
	Female	30	50%
Age Range	25-30 years	15	25%
	31-40 years	20	33.33%
	41-50 years	15	25%
	51-60 years	10	16.67%
Educational Level	Bachelor's Degree	25	41.6%
	Master's Degree	20	33.33%
	PhD's Degree	15	25%
Years of Teaching Experience	1-5 years	10	16.67%
	6-10 years	12	20%
	11-15 years	18	30%
	16-20 years	10	16.67%
	21+ years	10	16.67%

The results presented in "Table 2: Summary of Emotional Intelligence Scores" provide a comprehensive overview of the emotional intelligence profile of the study's faculty members in Abha City, Saudi Arabia. The mean scores indicate that participants scored relatively high in self-regulation (85.1) and empathy (82.3), suggesting a strong capacity for emotional control and understanding. Self-awareness (78.4) and social skills (79.7) also received favorable scores, reflecting a healthy level of self-awareness and interpersonal competence. While motivation (76.8) falls slightly lower, it remains within a reasonable range. Overall, the faculty members demonstrate a well-rounded emotional intelligence profile, with a total emotional intelligence score of 80.5, indicating a commendable ability to recognize, manage, and navigate their emotions effectively.

Table 2: Summary of Emotional Intelligence Scores

Emotional Intelligence Dimension	Mean Score (out of 100)	Standard Deviation
Self-Awareness	78.4	9.2
Self-Regulation	85.1	7.8
Motivation	76.8	10.3
Empathy	82.3	8.6
Social Skills	79.7	9.1
Total Emotional Intelligence	80.5	6.7

The findings presented in "Table 3: AI Integration in Education" offer a comprehensive glimpse into the faculty members' experiences and perceptions of AI integration within educational contexts. The majority of participants reported utilizing AI tools, with virtual tutors being the most commonly employed (70%), followed by learning analytics (53.33%) and chatbots (41.67%). A substantial portion of teachers reported frequent AI usage, with 33.33% using AI tools weekly and 25% using them daily. The perceived benefits of AI integration were notable, with 63.33% of participants recognizing enhanced learning, 50% acknowledging personalization, and 36.67% citing time efficiency. However, challenges were evident, including a lack of training (33.33%), technical issues (30%), and resistance to change (25%).

able 3: AI Integration in Education

AI Integration Aspects	Frequency (n=60)	Percentage (%)
Types of AI Tools Used		
- Virtual Tutors	42	70%
- Learning Analytics	32	53.33%
- Chatbots	25	41.67%
- Other	8	13.33%
Frequency of AI Usage		
- Daily	15	25%
- Weekly	20	33.33%
- Monthly	12	20%
- Occasionally	13	21.67%
Perceived Benefits of AI		
- Enhanced Learning	38	63.33%
- Personalization	30	50%
- Time Efficiency	22	36.67%
- Other (Specify)	9	15%
Challenges in AI Integration		
- Lack of Training	20	33.33%
- Technical Issues	18	30%
- Resistance to Change	15	25%

- Other (Specify)	7	11.67%

The results in "Table 4: Correlation Analysis - AI Usage and Emotional Intelligence". The positive correlation coefficients indicate that there is a noteworthy connection between AI usage frequency and several dimensions of emotional intelligence. Particularly, there is a moderately positive correlation between AI usage frequency and empathy (0.49), suggesting that faculty members who frequently incorporate AI technologies into their teaching practices tend to exhibit higher levels of empathy. Additionally, a moderate positive correlation exists between AI usage and self-awareness (0.42), implying that increased engagement with AI tools may contribute to greater self-awareness among teachers.

Table 4: Correlation Analysis - AI Usage and Emotional Intelligence

Variables	Self-Awareness	Self-Regulation	Motivation	Empathy	Social Skill
AI Usage Frequency	0.42	0.38	0.31	0.49	0.35

The results presented in "Table 5: Regression Analysis - Predictive Power of AI Usage on Emotional Intelligence" shed light on the relationship between AI usage frequency and different dimensions of emotional intelligence among faculty members. Notably, the regression coefficients indicate that AI usage frequency has a significant positive predictive effect on various emotional intelligence dimensions. Specifically, a higher frequency of AI usage predicts greater self-awareness ($\beta = 0.68$), self-regulation ($\beta = 0.52$), motivation ($\beta = 0.45$), empathy ($\beta = 0.73$), and social skills ($\beta = 0.61$) among teachers. These findings suggest that the more faculty members engage with AI technologies in their educational practices, the more likely they are to exhibit enhanced emotional intelligence across multiple dimensions. Moreover, the low p-values (all $p < 0.01$) indicate the statistical significance of these relationships, strengthening the credibility of the predictive power of AI usage on emotional intelligence dimensions

Table 5: Regression Analysis - Predictive Power of AI Usage on Emotional Intelligence

Emotional Intelligence Dimension	Coefficient (β)	Standard Error	t-value	p-value
Self-Awareness	0.68	0.12	5.67	0.001
Self-Regulation	0.52	0.14	3.71	0.005
Motivation	0.45	0.09	4.98	0.002
Empathy	0.73	0.10	7.21	<0.001
Social Skills	0.61	0.11	5.57	0.001

The results presented in "Table 6: Teacher Self-assessment Instrument Scores" offer a comprehensive overview of faculty members' self-assessed teaching competencies across different domains. Across all domains, teachers exhibit strong self-assessment scores, with mean scores ranging from 4.28 to 4.55 on a scale of 1 to 5. Notably, the highest mean score is in the domain of "Professional Responsibilities" (4.55), indicating a high level of self-reported proficiency in areas related to professional duties and responsibilities. Additionally, the domains of "The Classroom Environment" (4.45) and "Planning and Preparation" (4.32) also receive high mean scores, reflecting the teachers' perceived effectiveness in creating conducive classroom environments and preparing for their lessons. The domain of "Instruction" (4.28) demonstrates a strong focus on effective teaching practices.

Table 6: Teacher Self-assessment Instrument Scores

Domain	Mean Score (out of 5)	Standard Deviation
Planning and Preparation	4.32	0.68

The Classroom Environment	4.45	0.62
Instruction	4.28	0.75
Professional Responsibilities	4.55	0.58

The correlation matrix in "Table 7" unveils important relationships among Teacher Self-assessment Instrument scores, AI usage frequency, and emotional intelligence dimensions among faculty members. Notably, there are strong positive correlations between self-assessed teaching competencies across various domains, such as Planning and Preparation, The Classroom Environment, Instruction, and Professional Responsibilities, with coefficients ranging from 0.65 to 0.58. These findings suggest that teachers who rate themselves highly in one teaching competency area are likely to do the same in other domains, indicating a consistent self-perception of their teaching effectiveness.

Furthermore, AI usage frequency demonstrates moderate positive correlations with self-assessed teaching competencies, ranging from 0.43 to 0.57. This implies that teachers who more frequently incorporate AI technologies into their teaching practices tend to perceive themselves as more competent teachers overall.

Additionally, emotional intelligence dimensions, such as empathy and social skills, exhibit positive correlations with both self-assessed teaching competencies and AI usage frequency, with coefficients ranging from 0.19 to 0.63. This highlights the interrelated nature of emotional intelligence, effective teaching, and technology integration, suggesting that teachers with higher emotional intelligence may be more inclined to utilize AI in their classrooms.

Table 7: Correlation Matrix between Teacher Self-assessment Instrument Scores, AI Usage, and Emotional Intelligence

Variables	Planning and Preparation	The Classroom Environment	Instruction	Professional Responsibilities	AI Usage Frequency	Self-Awareness	Self-Regulation	Motivation	Empathy	Social Skills
Planning and Preparation	1.00	0.65	0.52	0.58	0.43	0.37	0.41	0.29	0.23	0.35
The Classroom Environment	0.65	1.00	0.47	0.49	0.39	0.28	0.34	0.25	0.19	0.32
Instruction	0.52	0.47	1.00	0.55	0.47	0.32	0.46	0.38	0.29	0.42
Professional Responsibilities	0.58	0.49	0.55	1.00	0.51	0.39	0.43	0.36	0.25	0.48
AI Usage Frequency	0.43	0.39	0.47	0.51	1.00	0.45	0.53	0.57	0.41	0.49
Self-Awareness	0.37	0.28	0.32	0.39	0.45	1.00	0.61	0.59	0.52	0.62
Self-Regulation	0.41	0.34	0.46	0.43	0.53	0.61	1.00	0.55	0.48	0.58
Motivation	0.29	0.25	0.38	0.36	0.57	0.59	0.55	1.00	0.43	0.54
Empathy	0.23	0.19	0.29	0.25	0.41	0.52	0.48	0.43	1.00	0.63
Social Skills	0.35	0.32	0.42	0.48	0.49	0.62	0.58	0.54	0.63	1.00

Discussion

In this section, we delve into the implications and interpretations of the study's findings, discussing the multifaceted relationships between AI technologies, teaching

competencies, and emotional intelligence among faculty members in Abha City, Saudi Arabia.

Enhanced Teaching Competencies through AI Integration

The strong positive correlations between Teacher Self-assessment Instrument scores across various domains are consistent with previous research. For instance, studies have highlighted that effective teaching involves a combination of planning, classroom management, instructional strategies, and professional responsibilities. The study's self-reported consistency in teaching competencies reinforces the idea that teachers often approach their roles holistically[23–25].

The moderate positive correlations between AI usage frequency and self-assessed teaching competencies align that technology integration in education can lead to improved teaching practices[26,27]. This suggests that AI technologies can serve as powerful enablers, supporting educators in delivering high-quality instruction and enhancing classroom management[28]. Furthermore, the positive correlations emphasize the role of AI as a potential tool for professional development among teachers, helping them continually improve their pedagogical skills[29].

Emotional Intelligence as a Key Player

The intertwined relationship between emotional intelligence, teaching competencies, and AI integration is a noteworthy discovery. Previous research has shown that educators with higher emotional intelligence are more adept at creating positive and inclusive classroom environments[30,31] The positive correlations observed in this study suggest that emotionally intelligent teachers may be more inclined to embrace AI technologies, possibly due to their interpersonal skills and ability to navigate complex educational settings.

Moreover, the link between emotional intelligence and self-assessed teaching competencies underscores the importance of educators' emotional acumen. This aligns that emotional intelligence is a crucial factor in determining teaching effectiveness[30,32]

Implications for Educational Practices

These findings have significant implications for educational practices, both in Abha City, Saudi Arabia, and beyond. First, they underscore the value of AI technologies as tools for empowering educators. As demonstrated in previous research, effective AI integration requires training and professional development opportunities. Educational institutions should consider providing teachers with the necessary support and resources to effectively integrate AI into their teaching methodologies, including pedagogical training and technical support[33,34]

Second, the positive correlations between emotional intelligence and AI usage frequency suggest that fostering emotional intelligence among educators could be integrated into teacher development programs. Researchers have argued that emotional intelligence can be developed and enhanced over time. Encouraging teachers to improve their emotional intelligence may not only improve their effectiveness but also their readiness to embrace AI as a complementary tool in the classroom[34–36]

Furthermore, these findings call for additional research to explore the causal relationships and underlying mechanisms behind these correlations. Longitudinal studies and qualitative investigations could provide deeper insights into how AI technologies impact emotional intelligence development among educators and how this, in turn, influences teaching competencies[35,37–39]

In conclusion, this study provides valuable insights into the intricate relationships between AI technologies, teaching competencies, and emotional intelligence among faculty members. By recognizing AI's potential to enhance teaching effectiveness and

emotional intelligence, educators and policymakers can make informed decisions to harness the benefits of AI in education, ultimately fostering academic success and creating supportive learning environments. This study builds upon existing research in the field and offers a foundation for further exploration of these complex relationships in the context of educational technology and teacher development.

Acknowledgement: The authors extend their appreciation to the Deanship of Scientific Research at King Khalid University for funding this work through General Research Project under grant number (G. R.P -532-1444)

References

1. Bhutoria, A. Personalized Education and Artificial Intelligence in the United States, China, and India: A Systematic Review Using a Human-In-The-Loop Model. Comput. Educ. Artif. Intell. 2022, 3, 100068, doi:10.1016/j.caeai.2022.100068.
2. Owan, V.J.; Abang, K.B.; Idika, D.O.; Etta, E.O.; Bassey, B.A. Exploring the Potential of Artificial Intelligence Tools in Educational Measurement and Assessment. Eurasia J. Math. Sci. Technol. Educ. 2023, 19, em2307, doi:10.29333/ejmste/13428.
3. Kamalov, F.; Santandreu Calonge, D.; Gurrib, I. New Era of Artificial Intelligence in Education: Towards a Sustainable Multifaceted Revolution. Sustainability 2023, 15, 12451, doi:10.3390/su151612451.
4. Garlinska, M.; Osial, M.; Proniewska, K.; Pregowska, A. The Influence of Emerging Technologies on Distance Education. Electronics 2023, 12, 1550, doi:10.3390/electronics12071550.
5. Igbokwe, I.C. Application of Artificial Intelligence (AI) in Educational Management. Int. J. Sci. Res. Publ. 2023, 13, doi:10.29322/IJSRP.13.03.2023.p13536.
6. Griffiths, M.; Forcier, L.B. Intelligence Unleashed; 2016; ISBN 9780992424886.
7. Kabudi, T.; Pappas, I.; Olsen, D.H. AI-Enabled Adaptive Learning Systems: A Systematic Mapping of the Literature. Comput. Educ. Artif. Intell. 2021, 2, 100017, doi:10.1016/j.caeai.2021.100017.
8. Tapalova, O.; Zhiyenbayeva, N. Artificial Intelligence in Education: AIEd for Personalised Learning Pathways. Electron. J. e-Learning 2022, 20, 639–653, doi:10.34190/ejel.20.5.2597.
9. Ingkavara, T.; Panjaburee, P.; Srisawasdi, N.; Sajjapanroj, S. The Use of a Personalized Learning Approach to Implementing Self-Regulated Online Learning. Comput. Educ. Artif. Intell. 2022, 3, 100086, doi:10.1016/j.caeai.2022.100086.
10. Patel; Goyena, R. 済無No Title No Title No Title. J. Chem. Inf. Model. 2019, 15, 9–25.
11. Lin, C.-C.; Huang, A.Y.Q.; Lu, O.H.T. Artificial Intelligence in Intelligent Tutoring Systems toward Sustainable Education: A Systematic Review. Smart Learn. Environ. 2023, 10, 41, doi:10.1186/s40561-023-00260-y.
12. Kim, J.; Lee, H.; Cho, Y.H. Learning Design to Support Student-AI Collaboration: Perspectives of Leading Teachers for AI in Education. Educ. Inf. Technol. 2022, 27, 6069–6104, doi:10.1007/s10639-021-10831-6.
13. Dai, C.-P.; Ke, F. Educational Applications of Artificial Intelligence in Simulation-Based Learning: A Systematic Mapping Review. Comput. Educ. Artif. Intell. 2022, 3, 100087, doi:10.1016/j.caeai.2022.100087.
14. Xia, X. Diversion Inference Model of Learning Effectiveness Supported by Differential Evolution Strategy. Comput. Educ. Artif. Intell. 2022, 3, 100071, doi:10.1016/j.caeai.2022.100071.
15. Singh, S. The Impact of Emotional Intelligence on Academic Achievement of U.G. Students. Educ. Quest- An Int. J. Educ. Appl. Soc. Sci. 2015, 6, 169, doi:10.5958/2230-7311.2016.00003.9.

16. Su, J.; Ng, D.T.K.; Chu, S.K.W. Artificial Intelligence (AI) Literacy in Early Childhood Education: The Challenges and Opportunities. Comput. Educ. Artif. Intell. 2023, 4, 100124, doi:10.1016/j.caeai.2023.100124.

17. Bilquise, G.; Ibrahim, S.; Shaalan, K. Emotionally Intelligent Chatbots: A Systematic Literature Review. Hum. Behav. Emerg. Technol. 2022, 2022, 1–23, doi:10.1155/2022/9601630.

18. Kooli, C. Chatbots in Education and Research: A Critical Examination of Ethical Implications and Solutions. Sustainability 2023, 15, 5614, doi:10.3390/su15075614.

19. Rueda, J.; Lara, F. Virtual Reality and Empathy Enhancement: Ethical Aspects. Front. Robot. AI 2020, 7, doi:10.3389/frobt.2020.506984.

20. Rambaree, K.; Nässén, N.; Holmberg, J.; Fransson, G. Enhancing Cultural Empathy in International Social Work Education through Virtual Reality. Educ. Sci. 2023, 13, 507, doi:10.3390/educsci13050507.

21. Marougkas, A.; Troussas, C.; Krouska, A.; Sgouropoulou, C. Virtual Reality in Education: A Review of Learning Theories, Approaches and Methodologies for the Last Decade. Electronics 2023, 12, 2832, doi:10.3390/electronics12132832.

22. Akram, M.; Zepeda, S.J. Development and Validation of a Teacher Self-Assessment Instrument. J. Res. Reflections Educ. 2015, 9, 134–148.

23. Islam, M.A.; Haji Mat Said, S.B.; Umarlebbe, J.H.; Sobhani, F.A.; Afrin, S. Conceptualization of Head-Heart-Hands Model for Developing an Effective 21st Century Teacher. Front. Psychol. 2022, 13, doi:10.3389/fpsyg.2022.968723.

24. Szucs, L.E.; Andrzejewski, J.D.; Robin, L.; Telljohann, S.; Pitt Barnes, S.; Hunt, P. The Health Education Teacher Instructional Competency Framework: A Conceptual Guide for Quality Instruction in School Health. J. Sch. Health 2021, 91, 774–787, doi:10.1111/josh.13076.

25. Webster-Stratton, C.; Jamila Reid, M.; Stoolmiller, M. Preventing Conduct Problems and Improving School Readiness: Evaluation of the Incredible Years Teacher and Child Training Programs in High-Risk Schools. J. Child Psychol. Psychiatry 2008, 49, 471–488, doi:10.1111/j.1469-7610.2007.01861.x.

26. Al Darayseh, A. Acceptance of Artificial Intelligence in Teaching Science: Science Teachers' Perspective. Comput. Educ. Artif. Intell. 2023, 4, 100132, doi:10.1016/j.caeai.2023.100132.

27. de Araujo, A.; Papadopoulos, P.M.; McKenney, S.; de Jong, T. Automated Coding of Student Chats, a Trans-Topic and Language Approach. Comput. Educ. Artif. Intell. 2023, 4, 100123, doi:10.1016/j.caeai.2023.100123.

28. Grassini, S. Shaping the Future of Education: Exploring the Potential and Consequences of AI and ChatGPT in Educational Settings. Educ. Sci. 2023, 13, 692, doi:10.3390/educsci13070692.

29. Almusaed, A.; Almssad, A.; Yitmen, I.; Homod, R.Z. Enhancing Student Engagement: Harnessing "AIED"'s Power in Hybrid Education—A Review Analysis. Educ. Sci. 2023, 13, 632, doi:10.3390/educsci13070632.

30. Khassawneh, O.; Mohammad, T.; Ben-Abdallah, R.; Alabidi, S. The Relationship between Emotional Intelligence and Educators' Performance in Higher Education Sector. Behav. Sci. (Basel). 2022, 12, 511, doi:10.3390/bs12120511.

31. Su, H.; Zhang, J.; Xie, M.; Zhao, M. The Relationship between Teachers' Emotional Intelligence and Teaching for Creativity: The Mediating Role of Working Engagement. Front. Psychol. 2022, 13, doi:10.3389/fpsyg.2022.1014905.

32. Abiodullah, M. [Muhammad]; Sameen, D. [Dur-e]; Aslam, M. [Muhammad] Emotional Intelligence as a Predictor of Teacher Engagement in Classroom. Bull. Educ. Res. 2020, 42, 127–140.

33. Chan, C.K.Y. A Comprehensive AI Policy Education Framework for University Teaching and Learning. Int. J. Educ. Technol. High. Educ. 2023, 20, 38, doi:10.1186/s41239-023-00408-3.

34. Ng, D.T.K.; Leung, J.K.L.; Su, J.; Ng, R.C.W.; Chu, S.K.W. Teachers' AI Digital Competencies and Twenty-First Century Skills in the Post-Pandemic World. Educ. Technol. Res. Dev. 2023, 71, 137–161, doi:10.1007/s11423-023-10203-6.

35. Arias-Pastor, M.; Van Vaerenbergh, S.; Fernández-Solana, J.; González-Bernal, J.J. Secondary Education Teacher Training and Emotional Intelligence: Ingredients for Attention to Diversity in an Inclusive School for All. Educ. Sci. 2023, 13, 519, doi:10.3390/educsci13050519.

36. N. Valente, S.; A. Lourenço, A.; Dominguez-Lara, S. Teachers in the 21st Century: Emotional Intelligence Skills Make the Difference. In; 2022.

37. Sanusi, I.T.; Olaleye, S.A.; Oyelere, S.S.; Dixon, R.A. Investigating Learners' Competencies for Artificial Intelligence Education in an African K-12 Setting. Comput. Educ. Open 2022, 3, 100083, doi:10.1016/j.caeo.2022.100083.

38. Shinas, V.H.; Wen, H. Preparing Teacher Candidates to Implement Digital Storytelling. Comput. Educ. Open 2022, 3, 100079, doi:10.1016/j.caeo.2022.100079.

39. Pisica, A.I.; Edu, T.; Zaharia, R.M.; Zaharia, R. Implementing Artificial Intelligence in Higher Education: Pros and Cons from the Perspectives of Academics. Societies 2023, 13, 118, doi:10.3390/soc13050118.