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The Role of Artificial Intelligence in Supporting Icebreaking Activities and Communication in Academic Settings: A Narrative Review

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Abstract

Background: The adoption of artificial intelligence (AI) in education is rapidly transforming student-teacher interactions, particularly during the initial stages of academic courses. Traditional icebreaking activities, designed to ease anxiety and build community, are increasingly enhanced by AI-driven tools that provide real-time feedback, personalized engagement, and adaptive communication. This review aims to examine current research and practices on the role of AI in supporting icebreaking activities and communication in academic settings, identifying key opportunities, challenges, and considerations for effective integration.

Materials and Methods: A narrative review was conducted, focusing on studies published up to December 2024. Multiple databases-Scopus, Web of Science, ERIC, PubMed, and Google Scholar-were searched using keywords such as "artificial intelligence," "icebreaking," "teacher-student communication," and "personalized learning." Studies addressing AI in educational icebreakers or communication were included; those lacking an educational context or peer review were excluded. Two reviewers independently screened and synthesized the literature by key themes.

Results: AI-powered icebreakers enhance classroom engagement by creating welcoming, interactive environments that personalize activities and provide real-time feedback. These tools help teachers efficiently design and adapt icebreakers, monitor participation, and identify disengaged students for timely support. Additionally, AI automates routine tasks, freeing educators to focus on deeper teaching and relationship-building. However, challenges include risks of superficial engagement, over-reliance on technology, and diminished authentic human connection. The effectiveness of AI-driven icebreakers depends on their thoughtful integration alongside traditional interpersonal approaches.

Conclusion: AI-driven icebreakers hold significant promise for fostering inclusive, engaging, and supportive academic environments. To maximize their benefits, educators should thoughtfully integrate AI tools as complements-not replacements-for human interaction, ensuring that technology enhances rather than diminishes the core values of education.

Key Words: Artificial intelligence, Challenges, Icebreaking activities, Opportunities.

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1- INTRODUCTION

The integration of artificial intelligence (AI) in education is rapidly reshaping academic environments, creating new opportunities to enhance teaching and learning processes. As educational institutions increasingly implement AI-driven tools, the dynamics of teacher-student relationships and classroom interactions are evolving significantly (1, 2). A common challenge in academic settings, particularly at the beginning of courses or academic years, is overcoming initial communication and engagement barriers among students and between students and instructors. These barriers, often stemming from anxiety and unfamiliarity, can limit active participation and obstruct the development of a collaborative learning atmosphere (3).

Traditionally, educators have used icebreaking strategies-structured activities aimed at fostering trust, reducing social anxiety, and building community-to address these challenges (4). With AI's advancement, these conventional icebreaking methods are being reimagined and enhanced. AI-powered platforms, including chatbots and adaptive learning systems, facilitate real-time communication, provide instant feedback, and enable personalized engagement, thereby supporting more inclusive and effective icebreaking experiences (5, 6). For instance, AI tools like ChatGPT accommodate diverse learning styles and allow students to interact with content and instructors in ways tailored to their individual needs (1, 7).

Furthermore, AI's capacity to analyze student data supports the customization of learning experiences, enabling differentiated instruction and targeted interventions (8, 9). This personalization strengthens emotional connections between teachers and students and promotes a more collaborative and supportive classroom environment (10, 11). In specialized contexts such as sports or skill-based courses, AI-driven systems can gamify learning, monitor progress, and facilitate communication among students, teachers, and parents (12, 13).

Despite these benefits, integrating AI in education presents challenges. Concerns include potential reductions in human interaction, over-reliance on technology, and ethical issues related to data privacy and algorithmic transparency (2, 14). Balancing technological innovation with the preservation of meaningful human connections remains essential as AI continues to shape the future of education (15, 16).

This review aims to examine current research and practice regarding the role of AI in supporting icebreaking activities and communication in academic settings. By examining recent studies and practical experiences, this paper highlights the opportunities, challenges, and key considerations for the effective integration of AI-driven icebreaking strategies in educational contexts.

2- MATERIALS AND METHODS

This narrative review examines current research and practices on the role of artificial intelligence (AI)-particularly AI-driven icebreakers-in supporting icebreaking activities and communication within academic settings.

2-1. Research Question

The main research question guiding this review is:
"How can artificial intelligence tools, especially AI-driven icebreakers, improve communication, interaction, and engagement between teachers and students?"

2-2. Literature Search and Study Selection

A comprehensive review was conducted across major academic databases,

including Scopus, Web of Science, ERIC, and PubMed, as well as the Google Scholar search engine. The search targeted articles published up to December 2024 to ensure the inclusion of the most current research. To capture all relevant studies, combinations of the following keywords were used: “artificial intelligence,” “AI,” “icebreaking,” “icebreaker activities,” “teacher-student communication,” “academic environments,” “education,” “personalized learning,” and “collaborative learning.” These terms were applied to identify peer-reviewed articles and conference proceedings addressing the role of AI in supporting icebreaking activities and communication within educational contexts.

After removing duplicates, titles and abstracts were independently screened for relevance by two reviewers. Full texts of potentially eligible articles were then reviewed in detail by both reviewers. Any disagreements regarding the inclusion or exclusion of studies were resolved through discussion until consensus was reached.

2-3. Inclusion and Exclusion Criteria

Studies were included if they:

- Focused on the application of AI in educational or academic settings;
- Specifically addressed icebreaking activities, teacher-student communication, or collaborative learning facilitated by AI;
- Were published in English or Persian in peer-reviewed journals or conference proceedings up to December 2024.

Studies were excluded if they:

- Focused solely on technical AI development without an educational context;
- Were opinion pieces, editorials, or not peer-reviewed;
- Did not address communication or interaction in academic settings.

2-4. Data Extraction and Synthesis

For each included study, key data were extracted, including the authors, publication year, the educational context (e.g., higher education or specialized classrooms), the type of AI tool or intervention used, key themes, and the icebreaking or communication strategies implemented. Main findings from each study were recorded, along with identified opportunities or advantages and challenges or limitations. These data were then synthesized narratively and organized by key themes, including communication enhancement, personalized learning, collaborative activities, the teacher’s role, ethical considerations, and emerging opportunities.

3- RESULTS

AI-powered icebreakers significantly enhance the classroom experience by creating a welcoming and dynamic atmosphere that boosts student engagement and supports success through more personalized and interactive learning. These tools enable educators to efficiently design, adapt, and analyze activities, freeing valuable time to focus on deeper teaching and meaningful learning interactions. The main characteristics of relevant studies, including educational context, type of AI intervention, and key findings, are summarized in **Table 1**.

3-1. Opportunities of AI Integration in Icebreaking Activities and Communication

a) Facilitating Effective Icebreaking Activities:

AI-powered chatbots (e.g., ChatGPT) and virtual assistants are increasingly used to initiate and personalize icebreaking activities, especially in online and hybrid classrooms (2, 10). These tools help introduce students, prompt interactive games, and lower social barriers, making the initial classroom environment more

welcoming and inclusive (3, 17). By analyzing student profiles, preferences, and engagement patterns, AI recommends icebreakers tailored to diverse personalities and learning styles, ensuring all students can participate actively and confidently (1, 18). Moreover, the real-time feedback provided by AI platforms reduces anxiety and fosters openness, further enhancing the effectiveness of icebreaking activities (2, 19).

b) Personalized Learning Experiences and Enhanced Communication:

AI-powered tools are transforming education by enabling truly personalized learning experiences and enhancing communication between teachers and students. By analyzing student data, AI can adapt content, pacing, and feedback to meet each learner's unique needs, while adaptive learning platforms and intelligent tutoring systems provide immediate, individualized support that builds trust and strengthens emotional connections (1, 9).

In icebreaking activities, AI ensures relevance and accessibility for all, promoting active participation and a sense of belonging (20). Furthermore, AI-driven communication tools allow students to ask questions and receive instant feedback, reducing anxiety and fostering a more open, inclusive classroom environment (6, 16). By making interactions more engaging and tailored to diverse learning styles, AI not only supports academic success but also helps create a welcoming, connected community for all learners (9).

c) Collaborative Learning and Classroom Dynamics:

AI-driven platforms use gamification and adaptive content to create dynamic, participatory learning environments that boost student motivation and involvement (13, 21). These intelligent systems can group students for collaborative projects and icebreakers, fostering a sense of community and belonging (1).

By facilitating peer feedback, interactive discussions, and real-time monitoring of engagement, AI empowers teachers to provide targeted support and cultivate mutual respect and shared responsibility within the classroom (16).

d) Superficial Engagement and Technology Dependency:

While AI-driven icebreakers and communication tools can spark initial excitement and make classroom interactions more approachable, there is a real risk that these engagements may remain superficial, focusing more on the novelty of technology than on building meaningful human connections. Research shows that when students interact primarily with AI platforms instead of peers or teachers, the depth of relationships and genuine collaboration can suffer (22). Over time, the initial allure of AI tools may wear off-a phenomenon known as "novelty fade"-leading to decreased motivation and reduced effectiveness in sustaining classroom engagement. This highlights the need for educators to thoughtfully update and integrate AI tools to maintain their impact (23). Furthermore, excessive reliance on AI for social and educational interactions can foster technology dependency, potentially hindering the development of essential social skills, emotional intelligence, and independent problem-solving abilities (1, 22). If not carefully managed, this dependency may undermine the core purpose of icebreakers: cultivating authentic relationships and a supportive classroom community. By using AI as a complement-not a replacement-for human interaction, educators can ensure that technology enhances, rather than detracts from, meaningful learning experiences (23, 24).

e) Enhancing Classroom Management and Teacher Support through AI:

The integration of artificial intelligence into educational administration is

transforming classroom management by automating routine tasks such as grading, attendance tracking, and lesson planning. This automation significantly reduces the administrative burden on teachers, allowing them to dedicate more time to meaningful pedagogical interactions and relationship-building with students (1, 6, 9). As a result, educators can adopt more student-centered and responsive teaching approaches, enhancing the overall quality of instruction and fostering a supportive learning environment (15). In icebreaking activities, AI's real-time analytics and monitoring capabilities provide powerful support by tracking student participation and engagement. These tools can quickly identify students who appear disengaged or isolated, enabling timely and targeted interventions that promote inclusion and active involvement from the very beginning of the course (1, 9).

Moreover, AI streamlines the creation of icebreaker questions and activities by automating content generation and dynamically adapting to student feedback, keeping interactions fresh, relevant, and engaging throughout the session (9, 13). This combination of efficient content creation and proactive classroom management empowers educators to focus on facilitating rich discussions and delivering impactful, personalized learning experiences.

3-2. AI Icebreaker Examples for Academic Settings

In academic settings, practical AI-powered icebreakers are transforming how educators foster engagement, creativity, and meaningful connections among students. By leveraging AI tools, these activities become personalized, interactive, and data-driven, making them especially effective for today's diverse classrooms (2, 9). Below are several practical examples and approaches supported by recent research and best practices:

a) AI as a Brainstorming Assistant: AI tools like ChatGPT can serve as virtual brainstorming partners, helping students generate ideas for projects or discussions (1, 9).

b) Personalized Icebreaker Activities: AI can tailor icebreaker questions or challenges to individual student interests and learning styles (9).

c) Data-Driven Insights for Instructors: During icebreaker activities, AI can analyze student interactions and provide educators with insights into group dynamics and participation levels (9, 12).

d) Creative AI-Enhanced Icebreakers:

- AI Icebreaker Bingo (16),
- AI-Generated Superhero Names (9),
- AI-Generated Dream Vacation (25),
- AI-Generated "Would You Rather? (9),
- AI Personality Match-Up (16, 26),
- Social-Emotional Learning (SEL) Icebreakers (21, 25, 27).

3-3. Challenges and Considerations

a) Potential Reduction in Human Connection:

Over-reliance on AI for icebreaking and communication may weaken authentic human relationships and emotional bonds between teachers and students (15, 22). Some students may find digital icebreakers impersonal or less engaging, particularly if these activities are not adapted to cultural or individual differences (17).

b) Dependency and Superficial Engagement:

Excessive use of AI tools may lead to students becoming dependent on technology, reducing critical thinking, and consequently engaging more superficially with educational content (15, 28). The initial novelty of these tools may diminish over time-a phenomenon known as "novelty fade"-weakening their effectiveness (12, 23).

c) Ethical and Privacy Concerns:

The use of AI in educational settings, including communication and icebreaker activities, raises important concerns about data privacy, consent, and the security of sensitive student information (29, 30). Additionally, algorithmic bias may result in unequal experiences or inadvertently disadvantage certain student groups (14, 31).

d) Teacher Training and Technical Challenges:

Effective integration of AI in classrooms requires ongoing professional development to ensure teachers can use these technologies confidently and ethically (16). However, uneven access to training and digital literacy may limit some teachers' ability to leverage AI tools effectively (25). Technical issues or poorly designed AI applications can disrupt classroom flow (10, 32).

3-4. Balancing AI and Human Elements

Balancing AI and human elements in education is essential to harness the full potential of technology while preserving the vital role of educators. AI should serve as a powerful support system that enhances personalized learning, automates routine tasks, and boosts engagement without replacing the critical human functions of teachers as mentors, facilitators, and ethical guides (2, 16). This balanced approach also involves educating both teachers and students on the responsible use of AI and maintaining transparency about how AI tools are integrated into the learning process (25).

4- DISCUSSION

The rapid advancement of artificial intelligence (AI) is profoundly influencing educational practices worldwide. As classrooms become increasingly diverse and technologically integrated, educators are seeking innovative strategies to foster engagement, collaboration, and a sense of community among students (1, 2). Icebreaking activities-traditionally used to ease social barriers and promote interaction-are now being reimagined through the lens of AI. Leveraging adaptive platforms, intelligent chatbots, and data-driven insights, AI has the potential to personalize learning experiences, support inclusive participation, and transform the dynamics of classroom communication (5, 6). Recent research highlights that these technological innovations not only streamline classroom management but also create more welcoming, interactive, and equitable learning environments (7, 10). This discussion explores the transformative role of AI in academic icebreaking and communication, examining both the opportunities and challenges it presents in contemporary educational settings.

4-1. The Transformative Role of AI in Academic Icebreaking and Communication

The integration of artificial intelligence (AI) into academic icebreaking activities and classroom communication is fundamentally reshaping educational engagement, collaboration, and relationship-building. Recent studies consistently highlight AI's capacity to personalize learning, deliver real-time feedback, and foster inclusive participation, making it a powerful catalyst for positive change in both traditional and digital classrooms (1-3).

4-2. Personalization and Inclusivity

AI-powered chatbots and adaptive learning platforms are increasingly used to initiate and personalize icebreaking activities, particularly in online and hybrid environments (5, 19). These tools can analyze student profiles, preferences, and engagement patterns, recommending icebreakers tailored to diverse personalities and learning styles (20). Such personalization reduces social anxiety and

fosters a sense of belonging, which is essential for building effective classroom communities (6, 10). Meta-analyses confirm that adaptive learning technologies and AI-driven feedback mechanisms significantly improve both engagement and learning outcomes by meeting students at their individual readiness levels (27, 33). AI also enables more equitable participation, ensuring that all students-regardless of background or personality-can actively engage in classroom activities (7, 11).

4-3. Enhancing Collaboration, Creativity, and Classroom Dynamics

AI-driven platforms facilitate collaborative learning by dynamically grouping students, gamifying activities, and providing instant feedback (13, 21). For example, AI can form groups based on complementary skills or interests, fostering more meaningful peer interactions and a sense of community (12, 24). Gamified AI icebreakers-such as AI-generated bingo or creative challenges-have been shown to boost motivation and participation, especially in remote settings where traditional social cues may be absent (26).
AI's ability to analyze classroom interactions and provide actionable insights enables early identification of disengaged or isolated students, supporting timely interventions and promoting a more inclusive environment (22, 34). Additionally, AI streamlines administrative tasks such as attendance, grading, and lesson planning, allowing educators to focus on deeper pedagogical interactions and relationship-building (25, 35).

4-4. Challenges: Superficial Engagement, Technology Dependency, and Ethical Concerns

Despite these benefits, several challenges persist. Over-reliance on AI can result in superficial engagement, where interactions are more with technology than with peers or instructors (18, 36). The "novelty fade" phenomenon-where the initial excitement about AI tools diminishes over time-can reduce their long-term effectiveness (37). Excessive dependence on AI-mediated communication may also hinder the development of essential social and emotional skills (4, 27). Ethical and privacy issues remain central to the discussion. The use of AI in educational contexts raises concerns about data security, algorithmic bias, and transparency (14, 29). Without robust safeguards, AI systems may inadvertently reinforce stereotypes or disadvantage certain groups of students (30, 31). Teacher training and digital literacy are crucial for responsible and effective AI adoption, yet disparities in professional development can exacerbate inequities in implementation (32).

4-5. Practical Applications and Future Directions

Recent literature and case studies illustrate a wide range of practical AI applications in academic icebreakers:

- AI as a Brainstorming Assistant: Tools like ChatGPT help students generate ideas for projects or discussions, encouraging creativity and collaborative thinking (1, 9).
- Personalized Icebreaker Activities: Adaptive platforms tailor questions and challenges to individual interests, ensuring relevance and inclusivity (19).
- Data-Driven Insights: AI analyzes student interactions during icebreakers, providing educators with actionable information to refine group dynamics and target interventions (12).
- Gamified and Creative Icebreakers: AI-generated games and activities, such as icebreaker bingo or superhero name generators, make introductions fun and interactive, promoting community building (26).

4-6. Study Limitations

A primary limitation of this review is its reliance on a narrative synthesis rather than a systematic review or meta-analysis. Although efforts were made to include a broad range of recent and relevant studies, the selection process may have been influenced by publication and language biases, as only peer-reviewed articles and conference proceedings published in English or Persian were considered. Additionally, most of the included research focuses on higher education and specialized classroom contexts, which may limit the generalizability of the findings to primary or secondary educational settings. The rapid evolution of AI technologies also means that some of the latest developments or unpublished innovations may not have been captured. Consequently, while this review provides a comprehensive overview of current trends and challenges, future research employing more systematic and inclusive approaches is recommended to further validate and expand upon these findings.

4-7. Recommendations

Emerging research suggests that the most effective use of AI in icebreaking and communication is as a complement-not a replacement-for human interaction (1, 15, 28). To maximize benefits and mitigate risks, educators should:

- Regularly update and diversify AI tools to maintain engagement and avoid novelty fade (5, 10).
- Prioritize ethical considerations, transparency, and data privacy (14, 29, 30).
- Invest in teacher training and digital literacy to ensure equitable and responsible AI adoption (6, 32).
- Foster authentic human connections alongside technology-mediated interactions (2, 24).

5- CONCLUSION

This review explored how artificial intelligence (AI) is currently used to support icebreaking activities and communication in academic environments, focusing on both the opportunities and challenges of this integration. The findings indicate that AI-powered tools can significantly enhance classroom engagement, personalize learning experiences, and streamline administrative tasks, allowing teachers to focus more on meaningful interactions and relationship-building with students. AI-driven icebreakers and communication platforms offer innovative ways to reduce social barriers, foster inclusion, and promote creativity, ultimately contributing to a more supportive and dynamic learning community.

However, the review also highlights important challenges, including the risk of superficial engagement, potential dependency on technology, and concerns related to privacy and ethics. Over-reliance on AI may diminish authentic human connections and hinder the development of critical social skills if not balanced with traditional interpersonal approaches. Therefore, while AI presents promising opportunities to transform educational communication and icebreaking, its integration should be approached thoughtfully, ensuring that technological advancements complement-rather than replace-the essential human elements at the heart of effective teaching and learning.

6- AUTHORS' CONTRIBUTIONS

Study conception or design: HA, and AP; Data analyzing and draft manuscript preparation: AP and LT; Critical revision of the paper: AP; Supervision of the research: HA; Final approval of the version to be published: HA, AP, and LT.

Table-1: Key International Studies on AI in Icebreaking Activities and Communication in Academic Settings.

Authors, (Year), Reference	Educational Context	Type of AI Tool / Intervention	Icebreaking/Communication Strategy	Main Findings	Opportunities / Advantages	Challenges / Limitations	Key Themes
Holmes et al. (2022), 1	Higher Education	AI chatbots, adaptive platforms	Personalized introductions, adaptive feedback, interactive Q&A	Enhanced engagement, trust, inclusivity	Tailored feedback, emotional connection, supports diversity	Tech dependency, risk of reduced human connection	Communication, Personalization, Teacher role
Zawacki-Richter, et al. (2019), 2	Higher Education	Grouping algorithms, AI-driven peer feedback	AI-formed groups for collaborative icebreakers, peer review	Improved team-building, increased collaboration	Community building, effective group formation	Novelty fade, shallow relationships	Collaboration, Communication
Treve, (2024), 3	Higher Education, Vocational	AI chatbots, virtual assistants	Automated icebreaker games, conversational support	Reduced social anxiety, increased participation	Inclusivity, accessibility, anxiety reduction	Can be impersonal, requires adaptation	Communication, Personalization
Chen et al., (2023), 5	Higher Education	AI-powered chatbots	Personalized icebreaker prompts, real-time Q&A	Boosted engagement, personalized learning	Instant feedback, supports diverse learners	Bias, privacy concerns	Personalization, Communication
Kumar, & Rose, (2024), 6	Higher Education, Inclusive Classrooms	Adaptive learning systems	Adaptive icebreakers, differentiated group activities	Supports diverse learners, increases inclusion	Differentiation, targeted support	Requires robust data, teacher training	Personalization, Collaboration, Teacher role
Iqbal, et al., (2024), 7	Higher Education	AI chatbots, communication platforms	AI-driven introductions, group icebreakers	Enhanced engagement, improved communication	Real-time feedback, inclusivity	Over-reliance on technology, privacy	Communication, Personalization
Chen et al., (2020), 9	K-12, Higher Education	Adaptive platforms, analytics	Dynamic icebreaker tasks, engagement monitoring	Personalized feedback, improved participation	Supports diversity, real-time adaptation	Needs updating, bias risk	Personalization, Teacher role

Authors, (Year), Reference	Educational Context	Type of AI Tool / Intervention	Icebreaking/Communication Strategy	Main Findings	Opportunities / Advantages	Challenges / Limitations	Key Themes
Wang et al., (2023), 10	Higher Education	AI analytics, monitoring	Participation tracking, automated feedback	Early detection of disengagement, targeted support	Data-driven insights, teacher efficiency	Privacy, algorithmic bias	Teacher role, Ethics
Papamitsiou& Economides, (2014), 12	Higher Education	Learning analytics, data mining	Analysis of icebreaker participation, engagement patterns	Data-driven personalization, improved inclusion	Data privacy, technical complexity	Personalization, Teacher role, Ethics	Not described
Wang et al., (2021), 13	Higher Education	Gamified AI platforms	Gamified collaborative icebreakers	Increased motivation, dynamic participation	Engagement, collaboration	Superficial engagement, over-reliance on novelty	Collaboration, Communication
D'Mello, & Graesser, (2015), 17	Higher Education	Affective AI, emotion-aware systems	Emotion-aware icebreakers, supportive communication	Enhanced emotional engagement, reduced anxiety	Complexity, privacy, cultural fit	Communication, Ethics	Not described
Wollny et al. (2021), 18	Higher Education	Chatbots	Conversational icebreakers, brainstorming	Supports creativity, engagement	Accessible, scalable	Limited deep analysis, novelty fade	Communication, Personalization
Lin & Ye. (2023), 19	Higher Education	Generative AI chatbots	Personalized dialogue, real-time response	Enhanced engagement, inclusivity	Multilingual support, instant feedback	Academic integrity, bias	Communication, Ethics
Wang et al., (2024), 20	Higher Education	Adaptive learning systems	Personalized icebreakers, learning pathways	Supports differentiated instruction, active participation	Data privacy, algorithmic bias	Personalization, Collaboration	Not described
Joshi, & Joshi. (2024), 21	Higher Education	Gamified AI-driven assessments	Icebreaker quizzes, team challenges	Increased motivation, formative assessment	Engagement, instant feedback	May not suit all learners	Collaboration, Personalization
Nguyen et al., (2024), 22	Higher Education	AI-powered tools	Icebreaker activities, interactive Q&A	Enhanced engagement, active participation	Approachability, inclusivity	Superficial engagement risk	Communication, Opportunities

Authors, (Year), Reference	Educational Context	Type of AI Tool / Intervention	Icebreaking/Communication Strategy	Main Findings	Opportunities / Advantages	Challenges / Limitations	Key Themes
Chaudharyet al., (2024), 23	Higher Education	AI-powered educational tools	AI-generated icebreakers, feedback	Improved learning outcomes, engagement	Real-time adaptation, scalability	Over-reliance, novelty fade	Communication, Personalization
Sun et al., (2024), 24	Higher Education	Human-AI collaboration tools	Co-designed icebreakers, collaborative content	Enhanced innovation, peer learning	Requires teacher facilitation	Collaboration, Teacher role	Not described
Luckin et al., (2016), 25	Higher Education	AI monitoring systems	Real-time engagement monitoring	Timely support, dynamic adaptation	Privacy, transparency, human-AI balance	Teacher role, Ethics	Not described
Durlak et al. (2011), 27	Higher Education	SEL AI chatbots	SEL-focused icebreakers, relationship building	Improved SEL skills, positive climate	SEL support, tailored prompts	Cultural adaptation, privacy	Ethics, Communication
Yogendra Deora et al. (2024), 29	Higher Education	Data privacy/AI ethics tools	Secure communication, privacy-preserving icebreakers	Increased trust, transparency	Implementation complexity	Ethics, Teacher role	Not described
Baker & Hawn, (2022), 31	Higher Education	Bias detection/AI analytics	Fair group formation, bias monitoring	Promotes equity, reduces bias	Algorithmic bias risk	Ethics, Collaboration	Not described

Abbreviations:

AI: Artificial Intelligent, SEL: Social-Emotional Learning, Q&A: Question and Answer, K-12: Kindergarten through 12th Grade.

7- CONFLICT OF INTEREST: None.

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