Supercharging teaching and learning practical skills within AI-enabled interactive technologies

Chapter

Supercharging Teaching and Learning Practical Skills within AI-Enabled Interactive Technologies

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Abstract

This chapter examines the integration of AI-enabled interactive technologies into higher education, focusing on their potential to develop practical skills required for contemporary work environments. Drawing upon qualitative methods and illustrative examples from immersive virtual reality, conversational AI systems, and digital human avatars, the chapter explores how these tools support simulation-based learning, iterative practice, and personalised feedback. While the findings offer valuable insights into design considerations, pedagogical frameworks, and implementation strategies, they are not intended to be generalised due to the study's methodological approach, sample size, and the specific institutional context in which the data were collected. Limitations of the study are primarily contextual and include the absence of longitudinal data, which restricts the ability to assess long-term impacts. Nonetheless, the chapter contributes to ongoing debates on the evolving role of universities in preparing graduates for the workplace and provides evidence-informed guidance for educators seeking to adopt these technologies in a sustainable and scalable manner.

Keywords: Generative AI, AI, immersive technologies, practical skills, higher education, learning, teaching, lifelong learning

1. Introduction

Higher education is undergoing a period of significant transformation, shaped by economic, political, social, and technological developments. Over the past decade, these shifts have become increasingly visible, affecting how universities operate, how students engage with learning, and how institutions prepare graduates for employment [1]. Among these influences, interactive artificial intelligence (AI) technologies, particularly generative systems, virtual environments, and large language models, are beginning to exert a strong and immediate impact on student expectations, behaviour and learning experiences [1, 2].

This chapter discusses how such technologies are being introduced into learning environments to support the development of practical, work-relevant skills [1]. It is informed by academic literature as well as my own experience designing and delivering immersive learning sessions using immersive technologies. These include the use of immersive virtual reality (VR) environments populated by digital human avatars and the pilot of a conversational Generative AI (GenAI) tool designed to help students practice interpersonal skills through dialogues using a voice-only interface.

The wider relevance of this discussion lies in the continuing debate within academia and the public sphere regarding the role of universities in preparing graduates for the workplace. Employers increasingly expect graduates to contribute from the outset, applying both technical knowledge and a set of interpersonal and behavioural skills [3]. These practical abilities, such as communication, adaptability, empathy, and leadership, are now seen as essential complements to disciplinary knowledge [1, 2]. For instance, a business graduate beginning a career in sales must not only understand pricing models and closing techniques but also manage client expectations, listen actively, and adapt their style under pressure. These are not easily acquired through lectures or exams alone.

Traditional university environments, whether in-person or online, often struggle to deliver these forms of learning at scale [1, 2]. Role-plays and scenario-based activities can be effective, but they require time, preparation, and often the involvement of trained facilitators or actors. They can also be emotionally demanding for learners and difficult to deliver consistently across large groups [4]. As a result, while universities recognise the importance of practical skills, many students only develop them later in the workplace [1–3].

Recent advances in GenAI now offer tools that can help bridge this gap. These technologies allow educators to facilitate experiences that are realistic, adaptable, and scalable [5]. GenAI can create interactive scenarios, provide immediate feedback, and adjust its responses to individual users. These systems are powered by large language models, which generate spoken or written content based on patterns learned from vast datasets. Though they do not possess understanding in a human sense, they are capable of producing natural, context-aware responses in real time. When used thoughtfully, they can support personalised learning in a way that is flexible and responsive to individual needs.

These applications typically run on cloud infrastructure, which enables them to operate at scale and remain accessible to users without the need for specialised hardware. AI–as–a-Service allows institutions to deploy sophisticated systems without building them from scratch. A further development, known as retrieval-augmented generation (RAG), allows AI tools to incorporate external sources of information, making the learning experience more relevant and grounded in the subject matter being taught.

This chapter offers a reflective account of how these technologies are being used to support teaching and learning [6, 7]. The first part focuses on immersive VR. Between 2023 and 2025, I facilitated more than 700 VR training sessions involving learners from a wide range of contexts. These included sixth-form students in schools across Berkshire in England, undergraduate and postgraduate students, academic staff, civil servants, and professionals from the private sector. Each session focused on developing practical communication skills, including interview preparation, negotiation, conflict management, and leadership communication.

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The VR experiences were delivered using a commercially available platform (www.bodyswaps./co) that combines digital human avatars with structured scenarios built around conceptual frameworks.

Qualitative data were gathered to capture participants' perceptions and reflections about their experiences training soft skills in VR. Out of more than 700 participants who completed a VR experience, a total of 123 participants completed an online survey; 35 of them then voluntarily provided written reflections in response to an open-ended prompt: 'Describe your experience of training a soft skill in a Virtual World with Digital Human Avatars'.

The sample profile of respondents primarily consisted of young people and students across various academic levels. Out of 123 active responses, the majority were young people (53), followed by undergraduate students (39), master's students (21), PhD students (4), and academic/faculty members (6). This diverse mix indicates a strong representation of learners at different stages of their educational journey, with a predominant focus on early-career individuals. The demographic composition suggests that the feedback reflects the perspectives of those actively engaged in academic development and likely to benefit from innovative learning tools, such as VR-based soft skills training.

For this chapter, only the qualitative accounts were analysed. All responses were anonymous to ensure participants' privacy and confidentiality in line with ethical research practices [8]. The textual data were subjected to a thematic analysis following six-phase approach, which supports the identification of recurring patterns in participants' subjective experiences [9].

This inductive analysis allowed themes to emerge directly from the data without applying a pre-defined coding frame, which is suitable when exploring experiential or interpretative questions [10]. Codes were grouped into higher-order themes, including the value of self-directed learning, the role of feedback and reflection, the challenge of emotional presence, the importance of realism in practice, the motivational effects of gamification, barriers to learning in digital contexts, and learners' expectations of personalised experiences. Each of these themes is discussed in turn in the following section. Thematic analysis was selected as it offers a flexible yet rigorous framework for interpreting qualitative data in educational settings [9].

The second part of the chapter presents findings from a study with second-year undergraduate students enrolled in a business and management module at a British university. Students were invited to take part in an optional activity in which they practised a simulated sales call using a GenAI companion. The AI acted both as a potential customer interested in purchasing a product and as a virtual mentor, offering guidance and feedback after each interaction.

The inductive data analysis [10] draws on interviews with twelve students and transcripts of interactions from thirty sessions between the students and the GenAI companion, carried out between February and May 2025. Only insights were extracted from the data to report students' perceptions of practicing a sales call with a GenAI system. Among other insights discussed in this chapter, I discuss the student's perceptions that the simulation helped them reflect on their communication style and build confidence before engaging in a real-world similar situation. They were often surprised by the AI's ability to vary its responses and introduce unexpected challenges. These findings are explored in detail later in the chapter.

The author reduced internal bias by cross-checking outputs with educators during seminars and workshops promoted at one international conference and two workshops delivered by the author to academics in two British universities. These sessions with academics were recorded, transcribed, and used by the researcher to support data analysis and interpretation. The data collected were stored securely in a private institutional cloud repository, and all data were anonymised.

Only the researcher has access to this data. The data collection was reviewed by the ethics committee of the leading university and granted ethical approval. The questionnaires for the VR project were answered voluntarily, and participants provided consent in doing so by scanning a QR code provided just after the experiences, in which only respondents who consented to participate answered. All participants were informed that the data collected would be anonymised and used only for academic writing. Access to the data can be requested from the corresponding author.

The remainder of this chapter is organised into four parts. First, it presents findings from immersive VR sessions using digital human avatars. Second, it discusses the use of conversational GenAI to support interpersonal skill development. Third, it explores adaptive learning approaches enabled by AI and their role in lifelong learning. Fourth, it considers the ethical challenges raised by these technologies, focusing on issues of bias, privacy, and accessibility, before concluding with reflections on their implications for higher education.

2. Learning with digital human avatars: Student voices and data-driven insights

Imagine entering a virtual setting that closely replicates the physical world with remarkable detail. This immersive, three-dimensional environment is inhabited by AI-driven digital avatars designed to communicate in a natural and emotionally expressive way. These avatars are capable of maintaining eye contact, actively listening, and engaging in meaningful dialogue that reflects contextual awareness and emotional intelligence. Within this space, learners can interact with avatars in scenarios that demand critical thinking and empathy, whether negotiating agreements, resolving disputes, or participating in simulated job interviews. The overall experience is crafted to feel both realistic and emotionally resonant, enhancing the sense of presence and engagement.

This immersive environment illustrates the principles of active learning pedagogy [7], in which learners are directly engaged in activities that require analysis, problem-solving, and decision-making rather than passively receiving information. By engaging in realistic role-play and scenario-based activities, learners actively build their understanding, experiment with various approaches, and reflect on the consequences of their decisions. The interactive nature of these simulations promotes deeper cognitive engagement and the development of transferable skills, as participants must navigate evolving situations and respond to subtle emotional and contextual cues. The safe virtual environment encourages exploration, the seeking of feedback, and repeated practice, enabling learners to hone both interpersonal and cognitive competencies that are vital for tackling complex, real-world challenges.

VR headsets significantly enhance the realism of virtual learning environments by tracking learners' eye movements, vocal tone, speech pace, and head motion. These features are vital for creating a genuine sense of presence and embodiment, both of which are essential for meaningful interaction within virtual settings [11, 12]. At the end of each session, learners receive personalised feedback through an AI-generated performance dashboard. This typically includes whether they maintained eye contact, the clarity of their speech, their use of filler words, and how their body language may have been perceived. These insights play a central role in the learning process by highlighting specific areas for improvement and prompting immediate reflection.

The transition from traditional face-to-face learning to learning with digital human avatars can be understood by examining key dimensions of the learning experience. **Table 1** presents a side-by-side comparison of these two approaches, highlighting how the shift in interaction mode, emotional engagement, feedback mechanisms, scalability, and adaptability alters the nature of active skill development. This comparison illustrates how immersive, AI-powered environments extend the possibilities of active learning by combining realistic, context-rich scenarios with the benefits of automation, scalability, and personalised feedback.

Such analytical feedback supports the learner's ability to assess and develop practical skills, such as communication, presentation, and negotiation. These personalised data points contribute to increased self-awareness and allow learners to monitor their progress more effectively [13]. In particular, GenAI avatars embedded within high-fidelity three-dimensional (3D) environments have been

Dimension	From: Active learning (face-to-face)	To: Learning with digital human avatars
Interaction mode	Physical presence with human actors or peers	Virtual presence with AI-powered digital human avatars
Emotional engagement	Generated through in-person cues, such as body language and tone	Generated through realistic avatar behaviour, voice synthesis, and emotional AI
Feedback	Provided by facilitators or peers, variable in immediacy and detail	Immediate, consistent, data-driven AI feedback on communication and non-verbal cues
Scalability	Limited by time, space, and the availability of skilled facilitators	Scalable for large groups, accessible from anywhere with internet and hardware (mobile, desktop, or VR headsets)
Cost & resources	Requires trained facilitators, physical venues, and scheduling	Requires VR/AR equipment and platform licences, lower marginal cost per learner
Psychological safety	May involve social pressure or performance anxiety	Reduced social judgement, allowing safe experimentation and failure
Adaptability	Adjustments depend on the facilitator's awareness and skill	AI can adapt scenarios in real-time based on learner responses
Repetition	Limited by time and resource availability	Unlimited practice opportunities with scenario resets
Data capture	Mostly observational, subject to facilitator bias	Automated collection of interaction metrics for detailed progress tracking

Source: Compiled by the author.

Table 1.
From face-to-face active learning to digital human-avatar learning.

shown to support realistic, context-sensitive conversations that mirror real-world interactions [14, 15]. These systems respond to learner input in natural language, allowing for a more lifelike learning experience.

The value of such immersive simulations is especially evident when learners must navigate complex social situations [16]. Previous research suggests that learners prefer avatar-based simulations over traditional video, citing fewer distractions and greater focus on the learning message [15–17]. Unlike video, avatar-led experiences reduce the intimidation that learners may feel when faced with human actors, while still encouraging emotional engagement and concentration. This enables learners to build communication skills in a psychologically safe environment [15, 16].

The visual appearance of avatars also influences learner engagement. Consistency in avatar behaviour, coupled with realistic gestures, facial expressions, and voice tone, contributes to a stronger sense of connection [18, 19]. Participants in virtual learning sessions reported feeling a stronger presence of avatars, which contributed to reduced feelings of isolation and increased willingness to engage in tasks. These findings are consistent with earlier studies on the role of presence and embodiment in digital learning environments [11, 12, 14].

Nevertheless, limitations persist. Some learners experience physical discomfort, such as motion sickness and fatigue, particularly during longer sessions. The technology also raises concerns about privacy, as VR systems collect extensive personal data, including movement, gaze, and voice patterns [20]. Additionally, not all learners are comfortable using VR hardware, especially those less familiar with immersive technologies. These factors highlight the importance of inclusive design, clear guidance, and technical support during implementation.

Despite these constraints, immersive environments supported by AI show significant potential for enhancing educational outcomes. VR can facilitate all stages of active learning [7], not only offering hands-on experience but also supporting action and reflection [7]. This is particularly valuable in developing skills such as leadership, negotiation, and communication, which require learners to practise in dynamic, context-rich environments that feel emotionally and socially authentic [15, 21].

Learners consistently emphasised how VR encouraged active, self-directed learning. Rather than passively absorbing content, participants navigated evolving scenarios based on their responses, reinforcing their sense of control and agency [22, 23]. Several participants stated they felt ‘more in control’ of their learning, particularly when they were able to rehearse presentations or interviews in a low-risk environment. One student remarked that the experience was ‘a very unique experience’, while another stated, ‘It reminded me of a lot of qualities that I forget are important’. Such reflections reinforce the cognitive and reflective elements supported by active learning pedagogy [7]. Moreover, feedback emerged as a key driver of improvement. Participants highlighted that AI-driven feedback, focused on tone, clarity, and delivery, was more consistent and immediate than that offered by human facilitators, enhancing both self-awareness and performance [21, 22].

Feedback emerged as a powerful learning mechanism. Participants noted that, unlike human facilitators who may hesitate to provide honest criticism, the system delivered direct and consistent feedback. This included metrics on speech speed, tone, clarity, and posture. One participant noted, ‘The feedback was immediate and really helped me understand what to improve’, while another shared, ‘I want to improve and try again after seeing how I sounded’. These comments reinforce the

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role of the AI system in supporting a feedback loop that fosters reflection and active experimentation [7].

Emotional engagement also featured prominently. While some expressed nervousness before their first session, many acknowledged that the realistic digital human avatars and immersive setting prompted genuine emotional responses. Learners described moments of hesitation, empathy, and self-reflection, particularly when discussing sensitive topics with avatars trained to simulate distress or disagreement. A student commented, 'I was nervous at first but felt more confident by the end', while another described the scenario as 'engaging and very realistic'. These insights accentuate the emotional realism and sense of presence evoked by embodied VR interactions [15, 24, 25].

Realism and embodiment were also linked to the effectiveness of feedback. Learners appreciated how avatars responded to subtle changes in tone and body language, and how these nuances were included in their performance feedback. A participant captured this perspective when stating, 'It was like seeing yourself from the other side of the table'. Such comments highlight how embodiment and perspective-taking function as integral parts of the learning process, enhancing the learner's ability to reflect on their behaviour and performance in realistic social settings [25, 26].

In comparing these findings with global research, similar studies highlight consistent themes. For instance, Dubiel et al. [26] emphasised how VR-based soft skills training in professional education improved communication and teamwork, echoing the experiences observed here. Other international studies [15, 22] noted both opportunities and constraints, reinforcing that, while VR promotes engagement, challenges around accessibility and inclusivity remain globally relevant [15, 22]

Finally, several learners explicitly likened the training to gameplay, indicating that gamification positively influenced motivation. Some described it as 'enjoyable and immersive', while others said it made them 'want to improve and try again'. These reactions suggest that the training's game-like structure, with performance indicators and repeated trials, encouraged persistence and a desire for improvement, particularly among younger participants. The motivational effect of this structure supports existing assumptions about the efficacy of gamification in skill development [27].

Gamified virtual environments were seen as promoting self-directed learning, as students explored, repeated tasks, and interacted with non-player characters (NPCs) at their own pace [27]. Similar to our study participants, younger students in prior research reported that the rewards and immediate feedback loops helped them 'want to improve and try again', validating the motivational power of gamification [27]. Moreover, authors found that students immersed in gamified metaverse experiences displayed higher levels of engagement and intrinsic motivation compared to traditional approaches, reinforcing the relevance of these elements in education beyond entertainment [28].

Finally, learners demonstrated a clear desire for personalisation. Many wished for the system to provide adaptive tips, learning pathways, or suggested practice routines tailored to individual weaknesses. This was particularly relevant for those with prior experience in communication or public speaking, who felt that more advanced challenges would maintain their engagement.

These VR training experiences, drawn from a range of contexts and analysed through participants' voices, reflect the growing potential of immersive technology to enhance practical learning. They also highlight several implementation challenges – technical, pedagogical, and organisational – that educators must consider. The analysis suggests that when VR is well-designed and carefully facilitated, it supports meaningful learning and equips learners with critical social and communication skills for increasingly complex and dynamic professional settings.

3. Conversational GenAI: Practicing skills, companionship, and personalised constructive feedback

Early chatbot systems in education were based on rule-driven conversational structures. These relied on predefined dialogue paths and could only respond when the user's input matched a programmed utterance. An utterance referred to the exact words or phrases entered, while the intent described what the user was trying to achieve, such as asking for a deadline or clarification. These systems, although innovative at the time, lacked flexibility and often failed to manage variations in language or unexpected user queries. For example, while a chatbot might respond correctly to 'When is my essay due?', it might not recognise 'What's the hand-in date for the paper?', unless specifically programmed. As a result, the exchanges often felt mechanical, superficial, and limiting in terms of user engagement.

Despite their limitations, rule-based chatbots initially supported administrative tasks such as routine queries and reminders. However, their rigidity and maintenance demands made them unsuited for developing interpersonal or reflective skills. Conversational chatbot systems have evolved significantly from their early, rule-based forms to the advanced GenAI and digital human agents available today. While early models supported basic administrative functions such as routine queries and reminders, their limited adaptability and reliance on pre-programmed responses made them unsuitable for developing complex interpersonal or reflective skills.

Over time, advances in natural language processing, sentiment analysis, and intent recognition have enabled systems to interact with greater context awareness, realism, and coherence. These capabilities are now applied across diverse domains, including municipal services. **Table 2** outlines this progression, showing the timeline of key systems, their core capabilities, and their limitations.

GenAI has brought forward more sophisticated solutions. For instance, the City of Amarillo introduced Emma, a digital human assistant able to converse in over 60 languages, designed and deployed with Dell's infrastructure and AI Factory framework [29, 30]. In aviation, Qatar Airways partnered with UneeQ to create Sama 2.0, a digital human flight attendant who engages customers with empathetic, real-time conversations via apps, kiosks, and immersive platforms [31, 32]. These implementations illustrate how GenAI has evolved systems from functional chatbots to adaptive, emotionally attuned digital human agents offering richer learning and service experiences.

These systems now respond with context awareness, realism, and coherence, enabling more authentic and flexible interaction. They are being integrated into teaching and learning processes as tools for developing practical competencies through simulation, feedback, and repeated practice. For example, Alelo provides cloud-based GenAI sessions in which professionals engage in challenging

Year	Example	Capabilities	Limitations
1966	ELIZA (MIT)	Basic pattern matching simulates conversation by recognising keywords	No understanding of context; limited to pre-programmed scripts
2001	SmarterChild (AOL/ MSN Messenger)	Interactive Q&A, entertainment, basic info retrieval	Limited adaptability; fixed responses; no emotional intelligence
2014	Microsoft XiaoIce	Emotionally aware conversation; context retention across sessions	Cultural/linguistic constraints; limited domain knowledge
2023	City of Amarillo 'Emma' (Dell AI Factory)	Converses in 60 + languages; supports city services	Domain-limited to municipal services; dependent on accurate data
2024	Qatar Airways Sama 2.0 (UneeQ)	Digital human flight attendant: empathetic, real-time conversation via multiple channels	Primarily customer service-focused; not a full training platform
2025	Alelo AI training	Cloud-based professional simulations; real-time personalised feedback; practice anytime	Requires internet access; dependent on the quality of AI feedback
2025	Retorio AI coaching	Simulates sales conversations; analyses verbal and non-verbal communication	Requires camera and microphone; accuracy varies with the environment
2025	Mursion	Blends immersive simulation with live coaching for workplace skills	High setup cost; limited scalability without automation.
2025	Promova Practice with AI	Language learning with idioms and vocabulary, real-time corrections, and context-rich practice	Focused on language learning; limited professional application.

Source: Compiled by the author.

Table 2.
Timeline evolution of conversational chatbot systems.

conversations with socially intelligent avatars, receiving immediate, personalised feedback and practicing as often as needed, resulting in significantly faster skill acquisition than with traditional methods [33].

Similarly, Retorio offers AI coaching software that simulates sales conversations and delivers tailored feedback on both verbal and non-verbal communication, helping staff refine their approach in a secure environment [34]. Mursion blends immersive simulations with expert coaching to support upskilling in workplace interactions, such as giving feedback or managing difficult dialogues, with evidence of strong learner engagement and transfer to real-world practice [35].

In the domain of language learning, several mobile applications support users in practising idioms through context-rich, bite-sized lessons. For instance, Promova's Practice With AI feature enables students to engage in dynamic vocabulary exercises, prompting them to use new words in sentence form, receive real-time corrections and guidance, and gradually build speaking confidence as they practise at their own pace [36].

The use of conversational AI companions in simulation-based training supports not only technical proficiency but also the development of critical thinking and communication strategies. These tools enable learners to exercise both individual judgement and social reasoning, reflecting recent calls to strengthen both dimensions of critical thinking in management education [37].

This study contributes to this agenda by examining how students cognitively and emotionally engage with AI companions when practising tasks that require persuasion, adaptability and reflection. Through structured role-play, reflective feedback, and user interactions, the study offers insight into how students engage cognitively and affectively with AI companions as part of their learning journey [37]. To support these aims, I have developed and implemented a voice-enabled AI tool for undergraduate business students to practise sales dialogues.

The AI plays two roles: first, as a customer interested in purchasing a VR headset, and second, as a sales mentor providing personalised feedback. Students access the system through a web interface and initiate voice interactions. The system introduces the simulation, explains its purpose, and invites the student to begin. The student is expected to identify the customer's needs, link these to the product's value and features, and manage any objections that arise. If the customer agrees to purchase, the student concludes the session by simulating payment collection. After the call, the AI delivers feedback linked to assessment criteria and provides an example of a model script. All interactions are stored securely and can be reviewed by educators to track progress and identify learning needs.

The tool provides a structured environment in which learners can repeatedly practise and refine professional behaviours. These learning opportunities reflect the principles of active learning pedagogies described by Scheuring and Thompson [38], whose research demonstrated that simulation-based experiences significantly support learners' self-assessed development of essential life skills, including adaptability, emotional intelligence, and decision-making. Their findings emphasise that simulations offer a safe space for experimentation, facilitate the application of theoretical knowledge in practice, and help build confidence in managing complex, real-world challenges.

These insights are directly relevant to the AI-powered sales simulation employed in this study, where learners are required to respond to diverse and often unpredictable scenarios in real time. This is particularly significant given previous research indicating that learners increasingly perceive such systems as supportive learning companions. These AI tools help extend understanding and encourage contextual application of knowledge, offering consistent and non-judgemental responses [39]. Similarly, Moundridou et al. [40] observed that GenAI systems enhanced the design and implementation of inquiry-based learning activities. Their ability to support task development, content adaptation, and guided questioning contributed to a more active and learner-centred approach.

Although their focus was on lesson planning, the implications for skill development are significant. The adaptability of these systems enables learners to move through stages of a task with real-time support, which is particularly relevant for practising skills such as negotiation, decision-making, and customer communication. This was reinforced by Maurya [41], who used ChatGPT as a simulated client in counselling training. Students practised responses, received immediate feedback, and repeated sessions until they felt confident. This iterative engagement helped to solidify learning, reinforcing the idea that AI companions can act as safe, private rehearsal spaces for developing interpersonal skills. These parallels emphasise the relevance of conversational AI not just in business education but also in emotionally complex domains such as counselling.

The benefits of early exposure to such simulations were explored by observing that first-year university students showed greater skill development than their final-year counterparts [38]. This supports the case for embedding AI-supported simulations early in degree programmes, particularly in modules that introduce professional communication and interpersonal skill-building. Furthermore, their extension of the life skills framework to include adaptability and resilience is especially relevant in AI-mediated simulations, where students are required to adjust to the AI's dynamic responses, manage uncertainty, and reflect on their performance.

From an educator's perspective, these technologies introduce opportunities for designing scalable, accessible, and personalised simulations [42]. By using cloud-based tools and natural language prompting, educators can create role-play experiences that adjust to each learner's level of performance. The strength of GenAI lies in its ability to simulate human-like engagement while remaining consistent and available at all times [43]. This opens new possibilities for offering continuous practice without increasing the teaching workload.

Students involved in the AI simulation research described the system as both useful and engaging. They were surprised by the variety and unpredictability of the AI's responses and felt encouraged to improve their product knowledge in preparation for subsequent attempts. These reactions are consistent with previous research, where it was found that business simulations not only improve subject-specific knowledge but also enhance self-assessed skills such as adaptability and resilience [38, 42]. Additionally, the findings of this study are consistent with those observed in studies of business simulations, which have been shown to strengthen both technical understanding and transferable skills [38]. In both cases, learners value the realism of the task, the safety of the environment, and the chance to fail without consequence.

The students' feedback also pointed to increased motivation and confidence. They valued the ability to practise multiple times in a private, low-pressure environment, at their own pace. Many preferred practising with the AI rather than with peers or tutors, citing the absence of social judgement and the system's consistent performance. Similar findings documented that students described AI voicebots as supportive, fair, and helpful [44]. Their presence filled a gap where human guidance was not available, particularly in formative stages of learning. Previous studies suggest that students practising counselling scenarios with ChatGPT not only improved their technical skills but also formed a sense of connection with the system [42].

This emotional engagement nurtured motivation to repeat and refine the interaction, an outcome echoed in my own study. Students reported feeling 'glad and happy' to use the sales companion, recognising the benefit of a non-judgemental partner that allowed for failure, experimentation, and growth. Students' willingness to engage repeatedly with the AI system indicates not only their desire to improve task performance but also an emerging disposition to revisit their assumptions and reframe their strategy. This affective dimension of critical thinking, curiosity, openness, and tolerance for ambiguity is crucial in preparing learners for AI-mediated work environments [37].

Despite these positive outcomes, several limitations must be noted. Students expressed a need for improved voice recognition, particularly for accents and varied phrasings. There were also occasional concerns about response consistency and the accuracy of information. These are valid observations, substantiated by other authors [39], who found that while learners appreciated the support of GenAI, they questioned the reliability of content and expressed concern about over-reliance on automated systems.

While learners valued the 24/7 availability and non-judgemental tone of the AI companion, there is a pedagogical risk that they may come to view its feedback as definitive. Authors caution that GenAI systems, due to their confident and coherent communication style, may lead students to adopt their outputs uncritically [37]. To mitigate this, we encourage educators to integrate reflection checkpoints that prompt learners to compare AI feedback with other sources or to explore what the AI might be omitting.

This discussion reinforces the need for careful oversight and integration by educators to ensure that AI tools complement rather than replace critical human judgement and feedback. This can be achieved with post-simulation debriefs, where students can be invited to reflect not only on their individual performance but also on the ethical and social dimensions of the simulated exchange. This reflects calls to develop students' social critical thinking and their capacity to question the broader societal assumptions embedded in AI-generated dialogues [37].

These findings align with global evidence. For example, Maurya [41] found that ChatGPT-based counselling simulations enhanced reflective practice among students, while Nyaaba et al. [39] described genAI as a 'learning buddy' valued for non-judgemental support. This comparative evidence suggests that the affective dimension of AI learning companions – motivation, confidence, and reflection – is consistently reported across diverse disciplines.

In summary, the integration of conversational genAI into higher education offers a valuable means of supporting the development of practical and transferable skills. These systems, when designed and deployed with pedagogical care, allow learners to practise, receive feedback, and grow in ways that reflect both industry expectations and academic standards. As Scheuring and Thompson [38] demonstrate, simulation-based learning can make a meaningful contribution to graduate employability. When combined with the flexibility and scalability of genAI, such tools represent a promising direction for enhancing life skills and learner agency in complex, technology-rich environments.

4. AI-enabled adaptive learning for lifelong learning

Adaptive learning refers to the use of technology, particularly AI, to personalise educational content and pace according to an individual learner's needs, abilities, and progress. Rather than following a fixed curriculum, adaptive systems analyse real-time data on learner performance, such as correct responses, time spent on tasks, and patterns of engagement, to adjust the level of difficulty, sequence of topics, and type of instructional resources provided [**45**]. This approach draws on AI algorithms for natural language processing, predictive analytics, and recommendation systems to ensure that the learner receives content that is both challenging and achievable, facilitating mastery before progression [46].

By providing personalised pathways and timely feedback, adaptive learning can nurture the motivation and confidence required for individuals to engage in learning as an ongoing practice rather than a one-off activity. When integrated into traditional teaching design, AI-enabled adaptive systems can complement existing curricula by offering targeted interventions, self-paced progression, and context-relevant challenges. This integration not only supports immediate mastery of subject matter but also cultivates the habits, self-regulation, and adaptability that underpin lifelong learning, equipping individuals to continuously update their knowledge and skills in response to evolving demands.

In this context, lifelong learning has become essential for career resilience, employability, and active participation in society [47]. It supports professional agility by ensuring that workers can update and expand their skills in response to emerging technologies and shifting market needs. In the age of AI, lifelong learning is particularly critical for professionals whose roles are being reshaped by automation and intelligent systems. The World Economic Forum [47] highlights that technological change is increasing the demand for cognitive skills such as analytical thinking, problem-solving, and creativity, alongside interpersonal abilities such as communication, emotional intelligence, curiosity, and collaboration. Without structured opportunities for continuous skill development, professionals risk skill obsolescence and reduced competitiveness in the labour market.

AI-enabled adaptive learning systems offer a scalable solution for fostering lifelong learning. By tailoring content and learning trajectories to individual needs, these systems become a cognitive partner that can support diverse learners, from undergraduates to senior professionals, in acquiring new competencies efficiently. They enable self-paced, personalised experiences, allowing learners to revisit challenging topics or accelerate through familiar material without relying on one-size-fits-all instruction [48]. Moreover, adaptive learning environments can integrate real-world simulations, scenario-based tasks, and AI-driven feedback loops to promote both technical and soft skills.

The benefits of AI-enabled adaptive learning systems are well-documented. Meta-analytic evidence indicates that these systems have a medium-to-large positive effect on cognitive learning outcomes compared with non-adaptive approaches [46]. They can enhance learner motivation, reduce dropout rates, and improve mastery by providing timely interventions and customised feedback [45]. Additionally, adaptive learning contributes to inclusivity by accommodating diverse learning styles, linguistic backgrounds, and levels of prior knowledge. Therefore, AI-enabled adaptive learning can be the catalyst for real symbiotic human–machine collaboration, fostering the development of unique human capabilities that distinguish themselves from AI capabilities. These are the skills and abilities previously cited in the World Economic Forum Report [47].

Practical applications demonstrate the versatility of these systems. Alelo's AI-driven avatars allow professionals to practise communication in high-stakes scenarios, offering immediate personalised feedback that accelerates skill acquisition. Similarly, Mursion blends AI simulations with live coaching to support skill development in leadership and customer service contexts. In language learning, platforms such as Promova integrate AI conversation partners for practising idioms and vocabulary, providing real-time corrections that improve fluency and confidence. Evidence from these implementations shows improvements in learner engagement, knowledge retention, and application of skills to real-world contexts [46, 48].

Findings from this study resonate with broader global research. Strielkowski et al. [45] argue that adaptive AI systems can transform educational delivery by supporting equity and inclusivity, while Wang et al. [46] provide meta-analytic evidence of medium-to-large positive effects on learning outcomes. Demartini et al. [48] further demonstrate how adaptive platforms in higher education foster targeted skill acquisition, consistent with the personalised pathways observed in this chapter.

Recent global work by UNESCO [49] also points to the transformative potential of genAI in reshaping assessment and pedagogy. The authors of this report argue that legacy assessment systems, particularly standardised testing, often constrain authentic learning and create systemic inequities. GenAI, when integrated into carefully designed educational environments, can enable continuous formative feedback, support multimodal knowledge creation, and reduce reliance on summative tests [49]. These perspectives align with the findings reported here, where adaptive AI tools fostered personalised and reflective learning pathways, and they underline the importance of designing AI use around principles of equity, inclusion, and epistemic justice.

However, several challenges remain. Ethical concerns include data privacy, algorithmic bias, and transparency in decision-making [45]. The successful adoption of AI-enabled adaptive systems also depends on educators' digital literacy, institutional readiness, and the availability of infrastructure. Over-reliance on AI tools risks reducing opportunities for human-to-human interaction, which remains essential for social learning and the development of empathy.

AI-enabled adaptive learning holds significant potential to transform lifelong learning by offering personalised, flexible, and effective educational experiences. By integrating these systems into both formal and informal learning pathways, education providers can equip learners with the skills necessary for professional resilience in an AI-driven world. However, realising these benefits requires addressing challenges around ethics, equity, and implementation to ensure that adaptive learning remains a tool for empowerment rather than exclusion.

5. Challenges and ethical assumptions in learning with AI-enabled interactive technologies

Despite the potential benefits of AI-immersive tools in education, several challenges and ethical considerations were raised. Many participants described their experiences with VR headsets as positive, while others highlighted barriers to effective learning. Some found online and independent learning demotivating without external structure, while a few reported motion sickness or discomfort when using the headset. Others expressed a preference for group activities or human feedback, noting the limitations of interacting solely with avatars. These perspectives underscore the importance of integrating VR into blended learning environments rather than offering it as a standalone solution.

The use of voice-over genAI simulations also presents challenges, particularly for international students whose first language is not English. Although the technology supports multi-language delivery, educators must consider whether it is appropriate for students to engage with content in their native language, even when enrolled in English-speaking programmes. Furthermore, when designing these applications, it is essential to ensure they are inclusive and accessible to learners with disabilities that may limit their ability to use such tools effectively.

Another critical issue is bias in AI models. Since these systems are trained on historical data, they may inadvertently replicate or amplify existing cultural, social, or linguistic biases, potentially affecting learners' experiences in unintended ways. Privacy and data security are also paramount concerns, as these tools often collect sensitive information, such as voice recordings, performance metrics, and behavioural patterns.

Additionally, there is a risk of over-reliance on automated systems, which could diminish opportunities for human interaction and peer learning if not carefully balanced. Finally, ensuring cultural appropriateness and inclusivity in avatar design, dialogue structures, and feedback mechanisms is vital to creating AI-enhanced learning environments that effectively serve diverse learner populations.

6. Conclusion

AI-enabled interactive technologies, such as conversational agents and digital human avatars, are reshaping how learners acquire and practise skills in both professional and educational contexts. Their ability to deliver personalised, context-aware, and realistic simulations offers clear benefits for developing practical competencies, critical thinking, and adaptability. However, these opportunities are accompanied by challenges related to ethics, bias, privacy, and cultural alignment. The effective integration of these tools requires a balanced approach that leverages their strengths while mitigating potential risks. This chapter has outlined their evolution, current applications, and implications for teaching and learning, highlighting the need for continued research into their impact and responsible use.

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