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Challenges in intercultural leadership: An overview of the SHUTTLE project and the incorporation of ethical AI in an HE context[1]

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Abstract

Intercultural leadership within the context of Education 5.0 is the ability to effectively navigate one's self and others through cultural differences as well as integrate technology, artificial intelligence (AI), personalized learning, and digital ethics to create learner-centered environments. Educators today are often eager to incorporate AI into their daily plans. However, research has shown that a gap in deep understanding of AI exists among higher education (HE) teachers and trainers. Therefore, many are unaware of the potential inaccuracies and discrepancies inherent to AI. Issues regarding fairness, privacy and bias being hardwired into any potential AI system fall under the tenets of ethical AI and are concerns that need to be properly analyzed in order to mitigate against unintended consequences and ensure that digital tools are not causing harm or being abused. This article will present an overview of the Erasmus+ SHUTTLE project, which aims to explore how AI-powered computing systems can extend or augment the possibilities of teaching, learning, and research while doing so ethically, responsibly, and humanely. Via a literary review and overview of relevant training for HE teachers, this article will discuss and draw attention to issues pertaining to the ethical creation of learner-centered environments in an HE context. An analysis of feedback surveys, piloted modules, pedagogical Framework, and an appendix of OER resources and Best Practices for educators will be presented. Recommendations for relevant future research and training will be described and assessed.

Keywords: Education 5.0, Artificial Intelligence, Ethical AI, Responsible AI

Introduction

In the past decade, aspects of Industry 4.0 such as Internet of Things and Artificial Intelligence (AI) have been incorporated into educational methodology. Education 4.0 emphasized a student-centered education style that incorporated digital technologies as active learning tools (de Souza and Debs, 2024) with the dual aim of promoting speed, accuracy, and knowledge while bringing education closer to the technological advances already in use by society and companies (Carvalho, 2023). However, with the rapid proliferation of smart technology and AI, Education 4.0 has evolved into the current tenets of Education 5.0, which seeks to both humanize the technology now used in teaching (Carvalho, 2023) and focus on students' social and emotional development, integrating AI and data-driven tools with humanistic pedagogies that emphasize

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creativity, emotional intelligence, and lifelong learning (Chigbu and Makapela, 2025, Hamedani et al., 2024).

However, as both Industry and Education evolve to their 5.0 theoretical frameworks, Chigbu and Makapela (2025) argue that a paradigm shift towards human-centric innovation, sustainable development, and digital transformation has taken place across industry, education, and the labor market. Nowhere is this shift more apparent than in the rapid, wide-scale implementation of AI into nearly all aspects of modern life.

Yet, the speed of AI development has led to a knowledge gap among many of its users. As educators and curricula rush to incorporate and utilize AI, there is often a training gap or deep understanding gap among educators who use AI. School Pulse Panel (2024) and Teaching for Tomorrow (2025) found that 68% of surveyed higher education (HE) teachers in the USA have not engaged in any AI training (even if such training was available). Such educators may therefore not be aware of the potential inaccuracies and discrepancies inherent to AI. Awareness and understanding of AI's impact are crucial, as AI-educated individuals are essential pillars of any successful AI system (Papagiannidis et al. 2025). Additional studies have mentioned potential ethical and academic concerns educators have over AI use (see AI in Education, 2024 and Mogavi et al. 2024). Issues regarding fairness, privacy and bias being hardwired into any potential AI system are concerns that need to be properly analyzed and addressed in order to mitigate against unintended consequences and ensure that such tools are not causing harm or being abused.

Within education, such problems pose a risk to both educators and students alike, as more and more schools and HE institutions adopt AI dependent tools and models into syllabi. In an attempt to mitigate the gaps in AI training and deep understanding among HE educators, AI training workshops and methodological best practices have been collected and piloted via the Sharing Future Learning Environments in Higher Education and Lifelong Learning (SHUTTLE) project, sponsored by Erasmus +. The project aims to explore how AI-powered computing systems can extend or augment the possibilities of teaching, learning, and research while doing so ethically, responsibly, and humanely.

This article presents an overview of the Erasmus+ SHUTTLE project and its completed outputs. It seeks to explore and mitigate the AI deep understanding gap among HE educators via SHUTTLE's training methodology while exploring ways to implement and utilize AI in the ethical creation of learner-centered environments in HE institutions. Best practices for educators will be highlighted as well as current problems and potential concerns surrounding AI. Additionally, a review of pertinent literature and relevant methodological resources will be discussed and analyzed.

Literature review

AI fundamentals and limitations

Artificial Intelligence (AI) is an outcrop of Machine Learning, a system that aims to simulate the human learning process in computers, with the goal of "creating systems that learn automatically in imitation of the way humans learn" (Sydle, 2021). Machine learning allows for fast processing of large datasets. Large Language Models (LLMs) are machine models that learn patterns and relationships from large volumes of text-based data to understand the structure of language (Ontotext, 2025) and work as statistical prediction machines that repeatedly predict the next word in a sequence, generating language that follows its learned patterns (Stryker, 2025). LLMs

essentially take a machine learning approach to designing predictive models based on patterns detected within sequences of words (Carroll and Borycz, 2024, Foster, 2021) Adapted for use in publicly available AI chatbots, the primary goal of these LLMs is to find statistical textual patterns in order to engage with users, resulting in a predictive text that allows for further user engagement. However, the question arises of which data sets are being analyzed. Carroll and Borycz (2025) have created a framework they call "The 5 I's" in an attempt to guide users' AI experience.

Their framework argues that search results are 1. *Incomplete* – due to LLM data sets primarily analyzing older sources which are readily open (free, not behind a paywall) and publicly available; 2. *Inconsistent* – multiple queries of the same question can often result in completely different responses that are based on previous user engagement and individual algorithmic patterns; 3. *Incoherent* – the origin or source of information is often not given at all (or can be made up); 4. *Illogical* – the chatbot is merely a machine that is predicting a response that will lead to further user engagement; 5. *Indulgent* – LLMs give priority to data that is the most popular, not the most accurate. Due to the inherent design of algorithms, when it comes to data, all clicks are equal. Subsequently, when it comes to AI, sources with the most clicks win.

It is easy to see the potential limitations of such a model, as users potentially need to independently verify the accuracy of any information given. Furthermore, several articles and publications have highlighted the inherent biases and algorithmic discrimination that can exist in current publicly available LLMs. The United States Department of Education (2023) warns against the "unintended consequences" of unscrutinized and unreflected AI use while highlighting issues related to potential bias and unfairness being hardwired into any potential AI system. Dai & Hua (2024) point out the feedback loop perpetuated by deep learning within potentially biased datasets. As more AI content is generated from these "tainted" datasets, the original bias is further entrenched within the model. This is further exacerbated if the generated content is wrong or inaccurate. It is therefore essential to find a way to work with AI in a way that does not reinforce these biases or inaccurate information. One suggestion for doing this is known as "Human in the Loop". Originally used in military, nuclear energy, and aviation contexts to allow humans to intervene in automated systems to prevent disasters, this method can be adapted in an AI context to give humans an opportunity to review and act upon AI-generated content (Prouty, Salesforce 2023, Liu et al. 2025).

AI ethics, fairness, and responsible AI in education

A brief survey of 94 students at UCT School of Business, Prague, Czech Republic, showed that 98% of students in the state Bachelor program used generative AI for their school work while over 60% used it for writing texts and/or solving academic problems. Nearly all students checked the accuracy of AI results and more than half of respondents believed the AI produced better work than their own (Zverinova, Hrebackova, 2025). In the USA, a recent survey revealed that 26% of teenagers had used ChatGPT for school work (Holtermann, 2025) while another American survey revealed around 36% of HE instructors described themselves as "frequent users of generative AI tools" (Hill, 2025). In the current educational environment, it seems that teachers are eager to incorporate AI into their teaching and lesson planning while students are both encouraged and warned against using it (Goldstein, 2025).

There exists additional disagreement in education circles over *who* and *when* AI should be used. According to a recent joint Welsh-Turkish research project, teacher response to student AI use

was inconsistent, highlighting the "need to develop a unified teacher identity that is shaped by GenAI literacy training, and supported by institutional policies" (Webb, Senaydin, 2024). Recent controversies have arisen over students being accused of cheating via improper AI use or after their work was flagged by AI detection software (see Holtermann, 2025, Engle 2025, and The Learning Network, 2025). In a 2023 survey, 58% of American teachers believed AI would negatively impact cheating over the next three years (Wiley, 2024). Yet a survey conducted by Lee et al. (2024) that same year found that cheating had not increased one year after the release of ChatGPT. Meanwhile, 68% of teachers regularly used AI detection software in the 2023/24 school year, despite these tools being ineffective and unreliable (Dwyer and Laird, 2024; Chaka, 2024). Further research from the University of Maryland found that AI detectors "frequently flag even minimally polished text as AI-generated [and] struggle to differentiate between degrees of AI involvement" (Saha and Feizi, 2025). To avoid false accusations, Holtermann writes that students have had to resort to "self-surveillance" measures such as recording their screens or keystrokes when doing their coursework.

At the same time, complaints have started to be made against teachers who use AI generated content for their own lesson plans and teaching materials. Hill writes of students at several American universities who have notified school administration and/or demanded course refunds after discovering that their teachers had used AI generated content for class materials or to provide feedback on work created by students. Holtermann writes that many educators and policy makers are not well-versed in AI and are being left to determine when AI is "evil" and when it is a "friend" on their own.

There also exists concerns related to the potential cognitive costs an over-reliance on AI tools may have, emphasizing the need for educational strategies that promote critical engagement with AI technologies (Gerlich 2025). Cheng et al. (2020) reported that some educators believe GenAI simplifies processes too much and can lead to students underestimating academic tasks, leaving them unable to discuss or present what they have produced. Mogavi et al. (2024) note concerns pertaining to an "overdependence" on AI tools that can increase student procrastination, decrease their sense of autonomy and competence, and hinder development of critical thinking and problem-solving skills. Additionally, Ahmad et al. (2023) discuss the relationship between the use of AI and loss in decision making, laziness, and safety in education, arguing that the increasing role of AI should be balanced by promoting authenticity, creativity, independence, and critical thinking in students, while emphasizing human-in-the-loop processes so that human scrutiny is not neglected.

Method

The Sharing Future Learning Environments in Higher Education and Lifelong Learning (SHUTTLE) project consists of team members from four partner universities: University of Applied Sciences in NYSA, Poland, Haaga-Helia Ammattikorkeakoulu Oy, Finland, Instituto Politecnico de Castelo Branco, Portugal, and Vysoka Skola Chemicko-Technologicka v Praze, Czech Republic.

At the start of the project, each partner was responsible for creating a transnational report based on a relevant transformational leadership skill within the context of Education 5.0 (self-leadership, collaborative leadership, business leadership, intercultural leadership, and digital leadership). Next, each partner conducted a literature review which focused on relevant background information, knowledge gaps, and main areas of need. Training events and

workshops were then organized for teachers and administrators of HE institutions based on mitigating the areas of need discovered via the literature review. Additionally, a relevant pedagogical framework and accompanying best methodological practices was developed and piloted to aid teachers and administrators in the implementation of ethical and responsible AI in HE institutions.

This article focuses primarily on the project work carried out by the team members at Vysoka Skola Chemicko-Technologicka v Praze, Czech Republic (UCT).

Literature review

In an effort to provide focus for the SHUTTLE partners, each partner institute carried out a literature review of pertinent articles and sources related to AI for each transformational leadership dimension. Team members at UCT carried out a non-systematic literature review between November 2024 and February 2025. The goal of the review was to establish context for the current issues regarding AI use in HE institutions and to focus on knowledge gaps which could be potentially ameliorated through the project. Team members were free to search articles via both academic and non-academic sources with no limitation to geographical or language origin. As a result, some limitations may apply, as article choice was informed by the professional and geographic interests of the individual team members. Each UCT team member chose 5 articles for review and created a summary of each via a standard summarization form that showed the source, link, and relevance of each article. Then, out of a cohort of approximately 25 articles, 5 were chosen for analysis in the transnational report, covering topics from Intercultural Communicative Leadership to Digital Leadership and AI Ethics, and AI or technologically assisted pedagogies.

Training

Training fell under the guise of “Train the Trainers” workshops where team members and administrators from partner institutes were given the opportunity to take part. These workshops were conducted in online and face-to-face (in-person) formats. Four online training sessions took place via the Zoom platform and one in-person session took place at UCT premises in Prague. Topics for the initial online training sessions included sessions on Framework completion and evaluation as well as those derived from areas of need established via the literature review. Feedback from these sessions determined the scope of the in-person session. Overall, topics included AI Literacy and Ethics, Sustainable Leadership, and Collaborative AI.

Training was carried out by both external trainers and project team members. Training workshops provided opportunities to pilot pedagogical modules develped for inclusion as best practices. The goal of the workshops was to familiarize participants with current issues pertaining to AI and its ethical use, give practical tips for incorporating AI in an individual educational context, and provide an opportunity for using some of the collected OER tools within the SHUTTLE framework.

The online training sessions were conducted between April and May 2025 and the in-person training session took place September 10-12 2025. Each online training session had between 13 and 42 participants while the in-person sessions had a range of 10 to 25 participants (depending on day or time). At the end of each session, a feedback form was administered via the google docs platform to participants. The results of the feedback were collected and analyzed by the respective partner institute in charge of the training and archived in the project google drive.

Cumulative analysis of the online training sessions by partner members then formed the basis for the workshops and training topics presented at the in-person training session.

The first online training session was conducted by an external trainer specializing in educational AI and focused on AI literacy and ethics. The trainer was selected by UCT team members after a search of available AI trainers for teachers on the Czech market. The rest of the online trainings were carried out by project team members and focused on the Framework, Sustainable Business Leadership, and Collaborative and Self-Leadership.

Feedback from the online sessions expressed a clear interest in deepening respondent knowledge of AI tool integration in both pedagogical and research contexts as well as further training on the use of AI tools within collaborative and sustainable leadership models. Therefore, the in-person training session included three workshops focusing on AI training and the piloting of modules dealing with issues pertaining to AI ethics and three workshops focusing on leadership skills (Collaborative, Sustainable Business/Value Creation, and Self).

The first of three AI-centric trainings was carried out by an external trainer and focused on familiarizing participants with available AI tools, chatbots, and relevant AI resources for use in education. Participants were able to actively use, edit, adapt, and create AI-powered teaching materials and explore AI-driven assessment strategies and interactive learning methods. Finally, participants were able to workshop prompt-writing exercises and activities.

Prompts, which are necessary for requesting information, content, or tasks from an AI chatbot, need to be written effectively in order to produce a quality output. Trainees learned of four general guidelines for prompt quality (provide context, submit a task, describe instructions and any potential constraints, and specify for whom, by what, etc.) and then workshopped and fine-tuned various prompt writing exercises.

The second workshop was the piloting of a module dealing with AI ethics, AI bias, and algorithmic discrimination while considering the Artificial Intelligence Assessment Scale (AIAS). Participants worked with a selected AI-based task design developed to demonstrate the key principles of machine learning, leading to user reflection on how ones' understanding of culture can be influenced by an unreflected use of AI. The module also introduced concepts such as AI bias, algorithmic discrimination, machine learning and data supervision, allowing participants space to critically reflect upon the relationship of culture and the way it is represented via technologies.

Finally, the third workshop focused on successfully utilizing AI in intercultural contexts. By focusing on the AI generation of specific cultural determinants, the module highlighted the importance of empirical human observation and verification, i.e., human-in-the loop, when dealing with real-world implications of AI outputs.

At the conclusion of the in-person training, all participants received a certificate of completion.

Framework

The AI teacher trainings were instrumental in the creation and piloting of best methodological practices, which have been compiled in the *Multidimensional Inclusive Pedagogical Learning Framework* (Shuttle, 2025). Open Educational Resources (OERs) are currently being piloted by team members at partner institutions and will be finalized upon completion of the project (2027). Piloting follows a standard format that has been agreed upon by all partners and is collected and

archived on the project google drive. All piloted modules take into account the feedback of participants and are curated to support the planning of learning scenarios using generative AI assisted tools. Furthermore, all OERs include examples of lesson plans, pedagogical practices, and applied pedagogical research.

The resulting four-part pedagogical Framework focuses on holistic development goals via integration of technology, sustainability, and human-centric learning with safe and ethical standards within the dimensions of transformational leadership. Among the goals of the pedagogical Framework is to provide structured guidelines for designing generative AI-assisted learning scenarios that foster skills development in core elements of Education 5.0.

The SHUTTLE Framework is divided into the following four components:

Part 1: A pedagogical Framework that describes in detail the dimensions of self-leadership, collaborative leadership, business leadership, intercultural leadership, and digital leadership in the context of Education 5.0. Concepts are clearly defined and guidance is provided for educators and students to explore, understand, and effectively apply them in an AI-centric practice.

Part 2: A visual representation of the pedagogical Framework which outlines the key dimensions and concepts that must be considered when designing future learning scenarios aligned with the SHUTTLE vision. The visual representation allows for quick reference of the transformational leadership dimensions which are part of the Framework.

Figure 1 The SHUTTLE Framework

Figure source: SHUTTLE 2025

Part 3. A toolbox of approximately 50 Open Educational Resources (OERs) that have been curated to support the planning of learning scenarios using generative AI assisted tools. This collection includes examples of lesson plans, pedagogical practices, and applied pedagogical research within the context of Education 5.0. and includes such resources as chatbots which can be modified and personalized by teachers and students alike, online courses and trainings relevant to ethical AI and prompt writing, and digital examples of best pedagogical practices and applied

pedagogical research. The toolbox is available on the SHUTTLE website and is organized as follows: Courses for Trainers and Teachers, Platforms and Tools, and Other Open-Source Materials. Each OER has a direct link to the resource, a relevant SHUTTLE dimension, a brief summary of the content and purpose, its relevance for HE, and a rating based on its potential to integrate principles of Education 5.0. Highlights from the toolbox are available in Appendix 1.

Part 4: Guidelines for trainers on each of the SHUTTLE Framework dimensions to help navigate and apply the above insights for relevant use in an HE context.

Results

The non-systematic literature review carried out by each partner institute on their respective transformational leadership skill resulted in four transnational reports, one for each partner. UCT Prague produced a report focusing on the interchange of digital and intercultural leadership with AI Ethics in technologically assisted pedagogies.

Training

Online training workshops

Three online training workshops were held with recorded participant feedback via online surveys (the fourth session did not record any feedback). In summary, a total of 23 responses were received. The responding cohort represented 12 different institutions and 13 areas of expertise. 61 % of respondents (14) self-assessed their experience using digital tools and AI as advanced, 35% (8) self-assessed their experience as beginner, and 4% (1) reported having no experience.

Participants were asked to rate several components of the training sessions and supporting materials using a 1–5 Likert scale. Analysis of the structure and clarity of the session was positively evaluated. The average score for the questions: “The session format was well structured and easy to follow” and “The learning objectives were clearly stated and explained” were 3.91/5 and 3.87/5, respectively.

Participants highlighted several benefits and found the training content engaging and suitable, with the only negative feedback concerning the limited time for each session, which, at times, restricted deeper engagement. Key takeaways from the sessions were a general consensus about the positive aspects of integrating specific AI tools to improve teaching and research activities and foster collaboration as well as the inherent responsibility and ethical considerations of using these tools.

As one of the main goals of the online training sessions was to clarify topics of interest for the face-to-face training session, respondents were asked to mention the topics they would be interested in having covered. Responses included: Practical use of specific AI tools in classes and for research; Practical leadership skills with AI and game scenarios; Ethical leadership and sustainable business models; Value creation; Critical analysis of what generative AI can and cannot do well and what the required human input is; and Formative assessment using AI.

Based on this feedback, several key areas for further training emerged, primarily centering on the practical and ethical integration of AI tools within higher education and a continued focus on leadership competencies. Additionally, there was a clear demand for more hands-on, practical training. This feedback was incorporated via the content and design of the face-to-face training sessions which later occurred.

Face-to-face training session

An online survey was given to participants of the face-to-face training session. 15 responses were received from participants representing all four partner institutes. All respondents worked in higher education, 13 were teacher/trainers, and 7 areas of expertise were represented. 60% of respondents (9) self-assessed their level of experience using digital tools and AI in education as advanced while 40% (6) self-assessed their level as beginner.

Participants were asked to rate several components of the training session and supporting materials using a 1–4 Likert scale. Analysis of the structure and clarity of the session were positively evaluated. The average score for the questions: "The session format was well structured and easy to follow" and "The learning objectives were clearly stated and explained" were 3.6/4 and 3.46/4, respectively. However, some participants felt some of the tested OERs were lacking, as one respondent gave a score of 2 to the question "The SHUTTLE Open Educational Resources (OERs) tested in each workshop were clear, engaging and usable", despite an overall average score of 3.4/4.

Participants highlighted several benefits and found the training content engaging and suitable. However, some negative feedback applied concerning the difficulty of some activities/tasks, as one respondent described the briefing as being not very objective while another respondent would have preferred more practical application of the given OERs instead of the theoretical approach applied. Similar to the online sessions, there were difficulties with the allotted time for the sessions, with one respondent citing the schedule as "quite exhausting" and not allowing for time to engage with other participants. One other negative feedback came in response to the question of whether diverse perspectives were encouraged during the workshop, with one respondent writing they "didn't think we succeeded very well in this goal", continuing that "it was not easy for participants to think about other people's perspectives" and that they "were surprised that there was relatively little talk from the students' perspective." However, the overall responses were positive, with key takeaways being an appreciation for idea exchange, the practical application and utilization of the relevant AI tools, and confirmation of the importance of applying critical thinking skills within an AI context.

Framework

An online training session was devoted to evaluation of the Framework and a subsequent online feedback survey was administered. Participation in this survey, compared to the others, was relatively low, as only 3 responses were given. All respondents were higher education teachers based in Portuguese institutions with over 10 years' experience in education, training, or related fields. Participants were "Slightly familiar" (2) and "Very familiar" (1) with leadership development concepts but self-assessed their level of experience using digital tools and AI in educational contexts as beginner.

Participants were asked to rate several components of the SHUTTLE framework and supporting materials using a 1–5 Likert scale. All items received a score of 4, which may seem to indicate a strong level of agreement and satisfaction. The evaluated aspects included questions regarding the clear definition of concepts within the Framework, support for the design of learning scenarios which address the needs of future learners in the context of Education 5.0, provision of sufficient guidance for educators and students to apply leadership dimensions, and questions

regarding the practicality, usefulness, and adaptability of the provided resources (Powerpoint, OER toolbox, Trainer Guidelines, pedagogical best practices).

The feedback indicates that participants understood the SHUTTLE pedagogical framework and considered its resources and guidelines to be practical and applicable. All components were rated positively (average score of 4), showing overall effectiveness and coherence.

Limitations

Some limitations apply to our methodology, which may have had unintended impact on the results. As the literature review was non-systematic, the ensuing articles chosen for review could be unintentionally biased in favour of individual team members' personal and professional interests, geographical or language limitations (or preferences), prior knowledge of the topic, and access to relevant research tools. Furthermore, due to the unstructured nature of the review, it is not possible to replicate the criteria for inclusion.

Regarding the training, participation was limited to the availability of individual team members, as participation in online training sessions was not mandatory. Furthermore, as the in-person training session was held in Prague, Czech Republic, some partner institutes may have had limited or imbalanced participation due to travel. Furthermore, level of individual engagement and active participation varied on an individual level.

One noticeable limitation was the inconsistent nature of participation in feedback surveys. One online session had no submitted responses while other sessions had relatively low response numbers. Although slides were prepared with QR codes for survey completion, strategies to encourage and ensure feedback submission were not successful. Respondents were either not motivated to reply or did not have enough time in the session structure for survey completion. Future training sessions will have to find more suitable ways to encourage active participation among participants as well as increased engagement with the feedback surveys.

Finally, as noted in the feedback comments, the trainings did not adequately take student perspectives into account, as they were primarily designed for HE teachers and trainers. However, in the future it could be useful and relevant to give a higher weight to student perspectives due to the nature of the HE environment.

Discussion

One of the goals of Education 5.0 is to harness digital transformation into a tool for social transformation and inclusion. Yet, as technological systems such as AI further engage in human-like processes (learning, predicting, summarizing, self-correcting, etc.) and the automation of repetitive tasks are steadily incorporated into education, there runs a risk that education can turn into a technological development rather than a human one (Shuttle, 2025). O'Regan & Ferri (2024) point out the issue of accountability and transparency, as "AI can produce outputs that appear to be humanly generated and therefore 'authentic', primarily by trawling through data that are already available and producing from that data hybridised outputs that appear plausibly coherent and real". As both students and teachers increase their AI use, the potential ethical implications will become harder to ignore.

One possible solution may be found via more systematic transparency of ones' AI use. Research conducted on EFL teachers by Webb and Senaydin (2024) emphasized teacher's calls for "a

fundamental overhaul of assessment practices, [that] embedded GenAI-enabled output inclusion with a clear grading criterion into the syllabus, which would encourage students to use GenAI tools ethically and responsibly". Webb (2025) promotes an AI Usage Rubric that describes five levels of AI use for any given assignment, ranging between 1., No AI, 2., AI-Assisted Idea Generation and Structuring, 3., AI-Assisted Editing, 4., AI Task Completion with Human Evaluation, and 5., Full AI. Furthermore, her rubric gives clear guidelines for what AI use is acceptable at each level and, additionally, includes an AI self-check list flowchart which students can consult to ensure AI was not used improperly on a given assignment. While *APA* guidelines suggest citing AI content as personal communication, the question can be asked whether students are expected to cite all uses of AI (such as on homework assignments) or only those used on graded exams, etc. As noted above, this is not only a problem for students. Educators and HE staff are often guilty of the same widespread AI use they accuse students of. Toncelli and Kostka (2024) have documented teachers' excitement, optimism, and curiosity about GenAI (quoted in Webb and Senaydin, 2024) while a recent series of articles published by the *New York Times* found that, among educators who use AI, they use it "as a tool to provide a better education" and to [save] time, [help] with overwhelming workloads and [serve] as automated teaching assistants" (Hill, 2025).

Despite these concerns, the technology is just too good not to use (Carroll and Borycz, 2025). Therefore, it is imperative that standards and awareness are established to ensure fair, safe, and ethical AI use. The framework of Trustworthy AI (also referred to as Responsible AI) is one attempt to do so. The framework calls for seven key requirements: 1., Human Oversight; 2., Technical Robustness and Safety; 3., Privacy; 4., Transparency; 5., Diversity and Fairness; 6., Societal and Environmental Well Being; and 7., Accountability (European Commission, 2024; see also Papagiannidis et al. 2025). Adherence to these guidelines can help maintain trust in AI systems while mitigating the potential risk factors associated with AI use (IBM, 2025).

Conclusion

It has become a common refrain that AI won't replace humans, but humans who use AI will replace those who don't. With that in mind, SHUTTLE's pedagogical Framework, OER Toolbox, and Best Practice Modules contribute towards bridging the AI deep-understanding gap among HE educators and the promotion of ethical AI within the context of Education 5.0.

Recommendations for future research

Responsible AI governance has been conceptualized as a framework that encapsulates the practices that organizations must implement in their AI design, development, and implementation to ensure AI systems' trustworthiness and safety (Papagiannidis et al. 2025). The SHUTTLE Framework, via its adaptation of transformational leadership skills into an AI context, has sought to more closely link these tenets to Education 5.0. However, further analysis and modification of the Responsible AI framework in an educational context could be a starting point for future research.

Recommendations for future training

The positive feedback on the structure, clarity, and engaging nature of the initial training sessions provides a strong foundation for future development. The focus for future training should shift from broad introduction to specific application and advanced concepts, directly addressing the

expressed needs and interests of the participants. Research attempts to find out and address the specific needs of HE teachers and trainers outside of the project group would also be a good opportunity to enhance professional development and directly contribute to the SHUTTLE project's goal of indirectly benefiting students through better-equipped educators.

Such possible future training can emphasize more practical AI use cases, focusing on “how-to” scenarios and specific strategies and tools that enable teachers to leverage AI for personalized learning pathways and efficient formative assessment methods. Another area of interest could include critical analysis of what GenAI can and cannot do well and what the required human input is. Tailored training for beginner users would also be beneficial as well as differentiated content or supplementary resources that cater to varying levels of digital and AI proficiency, ensuring that no participant is left behind.

Finally, it is essential to find ways to maximize participant engagement.

Researcher statement

The author contributed solely to the design, writing, and revision of this study. The author approved the final version of the manuscript and agrees to be accountable for all aspects of the work.

Conflict of interest statement

The author declares that there are no financial, commercial, or personal conflicts of interest related to this study.

Artificial intelligence usage and conflict of interest statement

The author states that no artificial intelligence was used in the writing, formatting, or language support of this article and that no conflict of interest exists.

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