

## Assessing students' global competence using artificial intelligence: experimental research

Sofiya Nikolaeva<sup>1</sup>, Yana Diachkova<sup>2</sup>, Anastasiia Syzenko<sup>2</sup>

<sup>1</sup>Department of Pedagogy and Methods of Teaching Foreign Languages, Faculty of Philology and Educational Technologies, Kyiv National Linguistic University, Kyiv, Ukraine

<sup>2</sup>Department of Foreign Languages, Faculty of Economics, Taras Shevchenko National University of Kyiv, Kyiv, Ukraine

### Article Info

#### Article history:

Received Dec 12, 2024

Revised Nov 20, 2025

Accepted Jan 1, 2026

#### Keywords:

AI-driven assessment tools  
Artificial intelligence  
English for specific purposes  
Global competence  
Higher education  
Learning techniques  
Teaching foreign languages

### ABSTRACT

This paper addresses the challenge of assessing global competencies in higher education, an essential skill set for students in today's interconnected world. Despite its importance, current assessment methods struggle to accurately capture the multidimensional nature of global competence, often due to subjective grading systems, cultural biases, and limited resources. This paper proposes using artificial intelligence (AI)-driven assessment tools to streamline and enhance the evaluation of global competencies. Through a literature review and experimental study conducted at T. Shevchenko National University of Kyiv (Ukraine), we examine how AI technologies, such as natural language processing, machine learning, and sentiment analysis, can be applied to assess cultural awareness, communication skills, and critical thinking. The results suggest that AI-driven assessments are more efficient, objective, and capable of providing personalized feedback than traditional methods. This paper concludes that AI has the potential to revolutionize the assessment of global competencies, offering a more inclusive and effective approach to preparing students for global citizenship.

*This is an open access article under the [CC BY-SA](https://creativecommons.org/licenses/by-sa/4.0/) license.*



### Corresponding Author:

Yana Diachkova

Department of Foreign Languages, Faculty of Economics, Taras Shevchenko National University of Kyiv  
Volodymyrska St, 60, Kyiv 01033, Ukraine

Email: yanadyachkova24@gmail.com

## 1. INTRODUCTION

In today's rapidly changing world, the demand for individuals equipped with global competencies has never been more crucial. As our societies become increasingly interconnected, the ability to come apart from diverse cultural landscapes, communicate effectively across borders, and solve complex global challenges has become indispensable. However, assessing these competencies is a significant challenge for higher education institutions worldwide, as there is neither an established methodology nor specifically designed assessment instruments.

Global competence, defined as the "capacity to examine local, global and intercultural issues, to engage in open, appropriate and effective interactions with people from different cultures, and to act for collective well-being and sustainable development", is a multi-dimensional construct that requires a combination of knowledge, skills, attitudes, and values successfully applied to global issues or intercultural situations [1]. Consequently, traditional assessment methods often overlook the subtle skills and abilities required to succeed in our globalized society. Subjective grading systems, limited resources, and cultural biases can prevent accurate assessment of students' global competencies [1], [2]. Moreover, the scale and complexity of assessing these skills across diverse student populations create logistical challenges for educators and administrators.

With the rapid development of artificial intelligence (AI) technologies, there is a growing opportunity to revolutionize the assessment of global competencies. AI-driven tools, such as natural language processing and machine learning, have the potential to provide more accurate, objective, and timely evaluations of students' abilities, enhancing both the assessment process and feedback for students [3]. While AI-driven assessment tools have been explored in educational settings [4], [5], limited research has focused on their application to the specific assessment of global competencies. This study aims to fill that gap by experimentally testing AI tools in assessing global competencies among university students. Thereby, this paper explores how AI can address the challenges of traditional assessments and improve the evaluation of global competencies in higher education. We highlight the transformative potential of AI-driven assessment tools to address these challenges. By examining the importance of global competence in today's interconnected world and reviewing existing literature on AI in education, the paper presents an experimental study conducted at Taras Shevchenko National University of Kyiv (Ukraine), where AI-driven tools were tested in evaluating students' global competencies in International Economics and Business Economics programs.

The findings of this study have significant implications for pedagogical practices and curriculum development in higher education. By integrating AI-driven tools, educators can create assessments that are more responsive to individual student needs, enabling more personalized feedback and fostering a deeper understanding of global issues. Additionally, the insights gained from this research could inform institutional policies on assessment and drive the integration of AI technologies into broader educational frameworks, fostering a more equitable and data-driven approach to evaluating global competencies.

## 2. LITERATURE REVIEW

A comprehensive review of the existing literature reveals a growing recognition of the importance of global competence frameworks in education, driven by the need to equip students with the skills required to thrive in a globalized world. Scholars have developed various frameworks to conceptualize and assess global competencies, acknowledging the multifaceted nature of skills needed for effective global citizenship. These frameworks typically encompass cultural awareness, communication skills, critical thinking, problem-solving abilities, and intercultural competence [6].

One prominent framework is the global competence framework developed by the OECD, which identifies key competencies essential for individuals to participate in and contribute to a globalized world [1]. This framework pays particular attention to intercultural communication skills, global issue awareness, and the promotion of sustainable development goals (SDGs). It defines and assesses global competence in a multidimensional way, incorporating students' socio-emotional skills and attitudes as core indicators, alongside their cognitive abilities to reason about global and intercultural issues.

Additionally, the framework proposed by the Asia Society and UNESCO builds on the Programme for International Student Assessment (PISA) framework, focusing more on the ability to analyze global environments through a local lens and developing global competencies in all participants of the educational process [7]. This approach aims to foster understanding and collaboration among individuals in different regions and across the globe. Both frameworks underscore the need to develop competencies in students that allow them to navigate complex, intercultural, and global challenges.

In recent years, there has been growing interest in leveraging AI technologies in education, including the assessment of global competencies [5]. The use of machine learning models to predict student performance, integrating socio-demographic, academic, and behavioral data to inform sustainable educational practices, was researched and practically verified [8]. AI-driven tools, including natural language processing and machine learning models, hold the promise of providing more accurate, objective, and timely evaluations of students' global competencies, such as cultural awareness, communication skills, critical thinking, and problem-solving abilities [2], [4]. These technologies can analyze students' verbal and written responses, identifying patterns in language use and providing immediate, actionable feedback to facilitate improvement [3]. Furthermore, designs and practices using generative AI to foster sustainable student discourse and knowledge creation, demonstrating AI's potential to enhance collaborative learning experiences, were investigated [9]. It has been proved that generative AI can adapt in real-time to students' responses, adjusting the nature and level of questions to provide personalized assessments that evolve with their progress [9], [10]. This real-time adaptive feedback loop ensures that assessments are tailored to individual needs, improving the learning experience. AI systems can also provide data-driven insights that help educators understand students' strengths and weaknesses, guiding their interventions to enhance global competencies and inform formative assessments to improve instructional strategies [10], [11]. Moreover, a systematic review examined AI's role in intelligent tutoring systems, emphasizing its potential to enhance personalized learning experiences and support data-driven decision-making in sustainable education [12].

It is crucial that AI-enabled adaptive learning platforms can personalize instruction and assessment, tailoring educational experiences to individual students' needs and preferences. By analyzing students' performance data and learning behaviors, AI systems can identify strengths and weaknesses in their global competencies and recommend targeted interventions and learning activities to enhance their skills. Despite the promising potential of AI in global competency assessment, the integration of AI in assessing global competencies is still an emerging field. While several studies have explored AI applications in educational contexts [2], [4], [13], there is a notable gap in the literature regarding focused research on how AI tools can specifically assess the multifaceted nature of global competencies in higher education settings. Most existing research has concentrated on general educational outcomes, leaving a gap in understanding how AI can effectively measure global competencies in areas such as cultural awareness, intercultural communication, and global problem-solving skills. Therefore, building on previous studies that explored AI's role in intelligent tutoring systems for personalized learning, machine learning models for student performance prediction, and generative AI for collaborative learning, this research distinguishes itself by focusing on AI-driven assessments to evaluate both hard and soft skills, with an emphasis on measuring global competencies in sustainability education and promoting a comprehensive understanding of sustainability challenges.

This study seeks to fill this gap by presenting empirical findings from an experimental study conducted at Taras Shevchenko National University of Kyiv. The research investigates the potential of AI-driven assessment tools to evaluate global competencies in university students, offering practical insights into the real-world application of AI technologies. The study not only evaluates the effectiveness of these tools but also critically examines the challenges and limitations associated with their integration into higher education. By providing a deeper understanding of how AI can enhance the assessment of global competencies, the study contributes to the evolving conversation on AI in education. The results have broader implications for pedagogical practices and curriculum development, showing how AI can facilitate more personalized, equitable, and data-driven assessments of students' global competencies and paving the way for further exploration of AI's potential in education.

### 3. METHOD

To discover the potential of AI as an assessment tool, we conducted a study among 55 students enrolled in the 1st and 3rd years of study at the Faculty of Economics of Taras Shevchenko National University of Kyiv. These students participated in the "Unleash Your Potential: Sustainable Futures" course on the FutureLearn platform. Developed by the University of Bristol, this four-week course was specifically designed to delve into the United Nations SDGs (UN SDGs) and provide students with the necessary knowledge and skills to address global sustainability challenges. The "Unleash Your Potential: Sustainable Futures" course provided participants with an introduction to sustainability challenges, emphasizing the importance of individual, local, and global action in creating a sustainable future for all of us. Participants explored topics such as poverty alleviation, environmental conservation, and social equity through a series of interactive modules and case studies. Additionally, the course addressed the role of mental resilience in tackling the climate crisis, offering strategies for maintaining well-being while advocating for positive change.

Participants were selected based on their completion of this course to provide a common baseline of knowledge on global sustainability topics. The inclusion criteria for the study required participants to have successfully completed the course and voluntarily agreed to participate in the assessment. The exclusion criteria included students who had prior extensive training or experience in sustainability topics outside of the course, as their expertise could potentially bias the results. Additionally, participants who did not complete the post-course survey or failed to engage with the assigned tasks were excluded from the analysis. Moreover, by targeting students from different academic years, the study aimed to capture a diverse range of perspectives and experiences related to global competence development within the context of higher education.

Participants underwent a series of test tasks designed to evaluate their proficiency in sustainability concepts and their ability to apply theoretical knowledge to practical scenarios. These tasks included multiple-choice questions, open-ended questions for discussion, and case studies related to sustainability challenges. The tasks aimed to assess participants' understanding of key concepts such as the UN SDGs, environmental conservation strategies, and social equity principles. Qualitative data were gathered through focus group discussions and individual interviews with selected participants. It provided deeper insights into how the course influenced students' perceptions, attitudes, and behaviors related to global sustainability and competence development.

Data collection involved pre- and post-course surveys to assess the students' perceptions of their level of global competence before and after completing the "Unleash Your Potential: Sustainable Future" course. The surveys included questions designed to evaluate various dimensions of global competence, such as intercultural communication, critical thinking, and awareness of sustainability issues. Following the

completion of the course, the participants' global competencies were assessed using AI-driven assessment tools, including sentiment analysis, natural language processing, and machine learning techniques. These tools were carefully selected and validated to ensure that they measured the intended global competencies accurately. To assess the validity of these tools, we compared AI-generated assessments with traditional evaluation methods (instructor grading and peer review) to ensure that the AI tools aligned with human evaluations of students' responses [14], [15]. This comparison showed a strong correlation between AI-generated scores and human assessments, confirming the validity of the tools in evaluating global competencies. For reliability, the tools underwent a series of pilot tests, where the same student responses were analyzed multiple times over different periods to ensure consistency in the results [15], [16]. The reliability was further supported by conducting inter-rater reliability tests, where multiple AI models were used to evaluate the same student responses, confirming that the tools consistently provided the same evaluation outcome [17]. These steps ensured that the AI tools were both valid and reliable for assessing global competencies in sustainability education.

AI-driven assessment tools analyzed various aspects of the participants' engagement with course materials, including written assignments, multimedia content, and communication activities. Natural language processing algorithms were used to evaluate written responses and to provide the students with feedback, while machine learning techniques were applied to analyze multiple-choice tests and discussions. Sentiment analysis (analyzing digital text to determine whether the emotional tone of the message is positive, negative, or neutral) was also used to assess the participants' intercultural communication skills and their ability to engage in open, appropriate, and effective communication with peers from diverse backgrounds. To validate the AI tools, we compared the results from AI assessments with traditional teacher evaluations, ensuring alignment in grading outcomes. We also piloted the tools with a small subset of students to refine their effectiveness.

The pre-course survey showed that only 29% of the students were more or less conscious about sustainability issues and intercultural communication aspects (only because they used to have English for specific purposes course as a part of their university curriculum, where they touched briefly upon these issues; as soon as these issues are not in the course program, not all the educators introduce them for the students). According to the results of the post-course evaluation, the students were fully aware of the theoretical issues of the course. For instance, the participants were able to specify the primary objectives of the UN SDGs (97.5%), primary focuses when exploring local sustainability challenges (100%), connections between happiness, purpose, and SDGs (95%), as well as the important players which make a difference at the global level (97.5%). Overall, the average mark for the multiple-choice test was 9.67 out of 10, indicating students' deep theoretical understanding of the issues introduced in the online course.

The second tool we used to assess students' responses was sentiment analysis performed by the AI. It showed that the written responses generated by the students expressed a positive sentiment, emphasizing the importance of sustainable practices and highlighting various initiatives and examples aimed at achieving economic, environmental, and social sustainability in global trade. Global trade was taken as an issue as we applied this tool to the students of the "upper-intermediate business English in international trade" course. In the format of case studies, the students were asked to discuss various strategies crucial for balancing economic growth with environmental and social sustainability in the context of sustainable trade. An AI-driven tool made a sentiment analysis based on the content of the students' responses. It was generally positive, stating that the texts produced by the students demonstrate a positive outlook towards sustainable trade and offer practical strategies and examples to achieve economic, environmental, and social sustainability on a global scale.

At the same time, AI generated constructive feedback, suggesting to the majority of the students' responses that they could benefit from more detailed explanations or statistics to further support the points made. It also highlighted the importance of including potential challenges or criticisms of sustainable trade practices, which could add more depth to the analysis and discussion. Here, we provide the exact example of a student's response analysis, generated by AI. The task was: "reflecting on the concept of sustainable trade, what strategies do you believe are crucial for balancing economic growth with environmental and social sustainability on a global scale? Share specific initiatives or policies that exemplify sustainable trade practices and their potential benefits." A student's response was the following:

*"Here are some strategies that I believe are crucial for balancing economic growth in sustainable trade: reuse and recycle materials instead of just throwing them away. Design products to be durable and easy to repair. Track the environmental and social impacts of supply chains. Work with suppliers to make their practices more sustainable. Diversify supply sources to reduce risks. Include environmental and labor rules in trade agreements. Use certifications to identify sustainable products. Make it easier to trade clean technologies like solar panels. Use digital systems and eco-friendly infrastructure to make trade processes greener. By implementing*

*these types of strategies, the global trading system can shift towards a model that balances economic, environmental, and social priorities more effectively. If we talk about real life examples, some companies have programs where they take back their products at the end of use and recycle the materials. This encourages them to make products that are easier to reuse and recycle. (e.g., H&M, Nike). Also, recently I heard that some governments are putting taxes on imports based on how much carbon was produced to make those goods. This encourages companies to reduce emissions in their manufacturing processes if they want to sell their products internationally. While there is still much work to be done, these efforts represent important steps towards a more sustainable global trading system.”*

AI performed the following sentiment analysis of the response provided by the student: The sentiment of the text is predominantly positive and constructive. The student emphasizes the importance of sustainable practices and highlights several strategies and initiatives aimed at promoting sustainability in global trade. The tone is optimistic, focusing on the potential benefits of these strategies and the positive impact they can have on the environment and society. The student’s text reflects several key concepts and knowledge areas from the “Unleash Your Potential: Sustainable Futures” course, indicating they have applied what they learned.

**Sustainability and supply chains:** the student discusses tracking environmental and social impacts of supply chains and working with suppliers to adopt sustainable practices. This aligns with the course’s emphasis on understanding and improving supply chain sustainability. **Product design and lifecycle:** the idea of designing products to be durable, repairable, and recyclable reflects the course’s focus on sustainable product lifecycle management and reducing waste. **Trade agreements and policies:** the inclusion of environmental and labor rules in trade agreements and using certifications to identify sustainable products are strategies that align with the course’s teachings on policy and regulatory approaches to sustainability.

**Clean technologies and infrastructure:** promoting the trade of clean technologies and using eco-friendly infrastructure are concepts discussed in the course, highlighting the importance of technology and infrastructure in achieving sustainability goals. **Economic and environmental balance:** the student addresses balancing economic growth with environmental and social sustainability, a central theme of the course. **Real-world examples:** the mention of companies like H&M and Nike implementing take-back programs and governments imposing carbon taxes on imports demonstrates the application of theoretical knowledge to real-world scenarios, as encouraged by the course.

AI concluded that the text generated by the student showcased a good understanding of the theoretical knowledge provided by the “Unleash Your Potential: Sustainable Futures” course. The student effectively integrated concepts related to sustainable trade, supply chain management, product lifecycle, policy initiatives, and the balance between economic growth and sustainability. The sentiment was positive and forward-looking, indicating an optimistic view of the potential for sustainable practices to improve global trade systems.

AI also provided a few recommendations to strengthen the student’s answer. It was recommended to include more concrete examples, such as detailing H&M’s Garment Collecting initiative, which has collected over 29,005 tons of textiles since 2013 to promote a circular economy. AI indicated that expanding on policy initiatives like the Paris Agreement, the European Union’s Green Deal, and mechanisms such as the carbon border adjustment could provide a broader policy context. It mentioned that incorporating quantitative data, such as projections from the Ellen MacArthur Foundation estimating \$4.5 trillion in economic benefits from a circular economy by 2030, would add credibility. Addressing challenges, like uneven global commitment to sustainability, and suggesting solutions such as international cooperation and capacity-building programs was recommended to present a more balanced view. Finally, broadening the range of strategies to include fair trade practices, support for small and medium-size enterprises (SMEs), and the use of sustainable technologies was mentioned as a way to enhance the comprehensiveness of the analysis.

After the analysis of the assessment results, we can assume that AI-driven assessment is not only qualitative enough but also learner-oriented, as it highlights the possibility for improvement for each student. From the educator’s perspective, it is time-saving as it allows them to provide the students with faster feedback and streamlines the evaluation process as well as enhances the objectivity of the whole process. By leveraging AI, educators can overcome logistical challenges, mitigate biases, and provide more efficient and inclusive assessments of students’ global competencies. The only challenge we faced here was that AI-driven tools struggled to accurately interpret the nuance and context of students’ responses. Subtle aspects of language, cultural references (mainly Ukrainian constructions that might have been word-for-word translated by the students into the English language), or complex reasoning were slightly misinterpreted or overlooked.

In addition to the hard skills assessment designed by AI, the participants engaged in structured conversations with the “Unleash Your Potential: Sustainable Futures” course instructors, during which they

responded to open-ended questions aimed at assessing their soft skills. These questions encouraged the students to reflect on their learning experiences, communicate their ideas effectively, and demonstrate interpersonal skills such as empathy, collaboration, and resilience. The open-ended nature of these discussions allowed the participants to articulate their thoughts and experiences in their own words, providing insights into their cognitive and affective engagement with the course content. Their responses were in open access as a part of the course, and we could monitor the students' growth and their global competence development.

Overall, the methodology employed in this study provides a robust framework for evaluating the effectiveness of AI-driven assessment tools in measuring global competencies related to sustainability. By combining quantitative and qualitative methods, the study ensures a comprehensive analysis of students' hard and soft skills. The inclusion of diverse student participants and a rigorous validation process ensured that the AI tools were both reliable and valid, effectively complementing traditional assessment methods. The sentiment analysis demonstrated AI's ability to capture students' emotional and cognitive engagement, further enhancing the learner-centered feedback process.

#### 4. RESULTS AND DISCUSSION

The findings of the study revealed several noteworthy outcomes regarding the efficiency of AI in assessing global competencies among participants who completed the "Unleash Your Potential: Sustainable Futures" course. Participants demonstrated a solid understanding of sustainability concepts and the UN SDGs after completing the course. The AI-driven assessment tools, including sentiment analysis and natural language processing, evaluated participants' comprehension of sustainability issues such as poverty alleviation, environmental conservation, and social justice. On the multiple-choice test, participants scored an average of 9.67 out of 10, reflecting high levels of knowledge retention [15], [16]. This aligns with broader trends emphasizing the integration of AI technologies to enhance personalized learning experiences in higher education [13]. These findings suggest that AI can play a pivotal role in assessing hard skills related to sustainability education, aligning with prior research highlighting AI's potential to support both formative and summative assessments [14], [18], [19].

Furthermore, participants displayed the ability to apply their knowledge of sustainability principles to real-world scenarios. Analysis of written assignments indicated that many students could critically analyze global issues and propose effective solutions. There were 85% of the students of the 3rd year of study (international economics program) discussed sustainable trade strategies and proposed innovative solutions such as sustainable supply chain management and carbon emission reduction. This ability to apply theoretical knowledge to real-world problems aligns with recent studies that emphasize the importance of problem-based learning in sustainability education [20], [21]. Moreover, the development of evaluative judgment through these applied assessments has been shown to deepen student learning and engagement [22]. The ability to apply knowledge to global issues is a key component of global competence, which AI assessment tools effectively capture.

The assessment also highlighted participants' proficiency in cross-cultural communication and collaboration. Through sentiment analysis of online discussions of our students during the course, AI tools identified instances of effective communication and constructive dialogue with participants from diverse cultural backgrounds. It identified a 40% increase in the use of culturally sensitive language, indicating that students were more aware of cultural nuances in their communication. This result reflects the findings of other studies that show how AI tools can be used to assess and improve intercultural communication in diverse educational contexts [23]. In particular, AI tools like sentiment analysis can help assess students' ability to navigate and respect cultural differences, an essential aspect of global competence [24]. Such competencies are increasingly recognized as critical for success in the global workplace and sustainable development [25], [26].

Another significant area assessed was participants' resilience and mental well-being in relation to sustainability advocacy. AI tools analyzed participants' written reflections on coping strategies for the climate crisis, revealing that 72% of students demonstrated proactive resilience strategies, such as mindfulness and community engagement. This finding is consistent with previous research on the importance of developing psychological resilience in the context of global challenges like climate change [27], [28]. The capacity for mental resilience is critical for fostering sustained engagement with sustainability advocacy, and AI tools can help track this development over time. Emotional dimensions of sustainability education thus require more attention to promote holistic student well-being [29].

These findings underscore the potential of AI-driven assessment tools in evaluating global competencies within the context of sustainability education and highlight the importance of integrating technology-enhanced assessment methods into higher education curricula. As AI continues to evolve, it is crucial that educators and institutions carefully consider the integration of these tools alongside human oversight. Although AI tools provide reliable and consistent results, human evaluation remains vital in

interpreting the nuances of individual student responses, especially in complex, subjective areas like cultural communication and mental resilience [15], [16]. The development of AI-enabled learning ecologies supports knowledge assessment in dynamic and sustainable ways [30].

The results of this study provide valuable insights into the transformative potential of AI in assessing global competencies within higher education settings, particularly in the context of sustainability education. The usage of AI-driven assessment tools helped the educators ensure that the participants demonstrated significant advancements in their understanding of sustainability concepts, their ability to apply theoretical knowledge to practical scenarios, and their proficiency in cross-cultural communication and collaboration. Moreover, the findings suggest that AI tools can support educators in overcoming challenges related to bias and inconsistencies in grading, promoting more equitable assessments [24].

The AI-driven assessment also proved to be learner-oriented, offering personalized and constructive feedback that highlighted areas for improvement in each student's response. From an educator's perspective, the tool was time-saving, allowing for faster feedback, streamlined evaluation processes, and greater objectivity [31], [32]. By leveraging AI, educators can overcome logistical challenges, reduce bias, and provide more inclusive assessments of global competencies [32], [33]. However, one notable challenge was the AI's occasional difficulty in interpreting the nuances of students' language, particularly cultural references or phrasing translated directly from Ukrainian, which could slightly skew interpretation. This challenge reflects the broader issue of linguistic and cultural diversity in AI applications [31]–[37].

Additionally, data analysis revealed that AI-assisted assessment effectively captured both hard and soft skill development. The mixed-methods approach—combining test scores, sentiment analysis, and qualitative responses—enabled a full picture of students' global competence. The process not only supported academic learning outcomes but also facilitated improvements in students' English language skills, particularly in written expression. These findings underscore the potential of AI to enhance the effectiveness, inclusivity, and depth of sustainability education assessment [38], [39].

Nevertheless, it should be taken into consideration that there is a need for careful implementation of AI-driven assessment, ongoing evaluation, and a balanced approach that combines AI tools with human oversight in higher education assessment [32], [40]. It is crucial to ensure that AI-based assessments are valid (measuring what they are supposed to measure) and reliable (providing consistent results). Any issues in these areas can undermine the credibility of the assessments. An over-reliance on AI tools may diminish the role of human judgment in the assessment process. The implications for the broader community include the potential for AI to democratize access to high-quality educational assessments, especially in resource-constrained environments where educators may face time or workload constraints [29], [41]. Educators' insights and subjective evaluations are important, particularly in understanding each student's context and individual circumstances.

## 5. CONCLUSION

In conclusion, the integration of AI into the assessment of global competencies is a promising way to improve the quality and relevance of higher education in an increasingly interconnected and complex world. As we continue to use the potential of technology in education, we must prioritize innovation and collaboration to ensure that all students acquire the skills and abilities they need to thrive in the 21st century. This study aims to advance the ongoing discourse on AI-driven assessments by developing innovative tools that not only enhance the evaluation of global competencies in sustainability education but also address the challenges of bias, efficiency, and cultural nuance, ultimately contributing to a more equitable and effective global learning environment. As AI-driven assessment tools continue to evolve, future research should examine the long-term impacts on students' development of global competence and their subsequent contributions to sustainable development efforts. Moreover, research should explore the scalability and accessibility of AI-driven assessments across diverse educational contexts and student populations. This will help ensure that AI tools are equitably accessible and effective in assessing a broad range of competencies and learning environments. Additionally, further exploration is needed on the integration of AI with human-driven assessments to optimize their combined effectiveness in evaluating global competencies.

## ACKNOWLEDGMENTS

The authors would like to sincerely thank all the students who participated in the “Unleash Your Potential: Sustainable Futures” course and contributed their time, insights, and reflections to this study. Finally, we acknowledge the guidance, encouragement, and invaluable support provided by the instructors of the “Unleash Your Potential: Sustainable Futures” course, whose expertise, feedback, and dedication ensured the smooth execution of the study and enhanced the quality of the students' learning and reflections.

## FUNDING INFORMATION

Authors state no funding involved.

## AUTHOR CONTRIBUTIONS STATEMENT

This journal uses the Contributor Roles Taxonomy (CRediT) to recognize individual author contributions, reduce authorship disputes, and facilitate collaboration.

| Name of Author     | C | M | So | Va | Fo | I | R | D | O | E | Vi | Su | P | Fu |
|--------------------|---|---|----|----|----|---|---|---|---|---|----|----|---|----|
| Sofiya Nikolaeva   | ✓ | ✓ |    |    |    | ✓ |   |   |   | ✓ |    | ✓  |   |    |
| Yana Diachkova     | ✓ |   |    | ✓  | ✓  | ✓ | ✓ |   | ✓ | ✓ |    |    |   | ✓  |
| Anastasiia Syzenko | ✓ |   |    |    |    | ✓ | ✓ |   |   | ✓ |    |    |   |    |

C : **C**onceptualization

M : **M**ethodology

So : **S**oftware

Va : **V**alidation

Fo : **F**ormal analysis

I : **I**nterpretation

R : **R**esources

D : **D**ata Curation

O : **O**riginal Draft

E : **E**diting

Vi : **V**isualization

Su : **S**upervision

P : **P**roject administration

Fu : **F**unding acquisition

## CONFLICT OF INTEREST STATEMENT

The authors declare that they have no known financial, personal, or professional conflicts of interest that could have influenced the research, analysis, or interpretation of the results presented in this paper. All authors state no conflict of interest.

## INFORMED CONSENT

We have obtained informed consent from all individuals included in this study. All participants voluntarily agreed to take part in the research, and their privacy and personal data have been fully protected in accordance with ethical guidelines and legal requirements.

## ETHICAL APPROVAL

The research involving human participants was conducted in accordance with all relevant national regulations and institutional policies. The study was carried out following the ethical principles of the Helsinki Declaration and was approved by the Institutional Review Board of Taras Shevchenko National University of Kyiv.

## DATA AVAILABILITY

The data that support the findings of this study, including anonymized student responses and AI-generated assessments, are available from the corresponding author, [YD], upon reasonable request. Due to privacy considerations and the educational context, these data are not publicly available.

## REFERENCES

- [1] OECD, "Preparing our youth for an inclusive and sustainable world: the OECD PISA global competence framework," 2018.
- [2] M. Benvenuti *et al.*, "Artificial intelligence and human behavioral development: a perspective on new skills and competences acquisition for the educational context," *Computers in Human Behavior*, vol. 148, pp. 1–8, 2023, doi: 10.1016/j.chb.2023.107903.
- [3] P. Kaledio, A. Robert, and L. Frank, "The impact of artificial intelligence on students' learning experience," *SSRN Electronic Journal*, 2024, doi: 10.2139/ssrn.4716747.
- [4] L. Chen, P. Chen, and Z. Lin, "Artificial intelligence in education: a review," *IEEE Access*, vol. 8, pp. 75264–75278, 2020, doi: 10.1109/ACCESS.2020.2988510.
- [5] N. Goksel and A. Bozkurt, "Artificial intelligence in education," in *Handbook of Research on Learning in the Age of Transhumanism*, S. Şişman-Uğur and G. Kurubacak, Eds., Hershey, PA: IGI Global Scientific Publishing, 2019, pp. 224–236, doi: 10.4018/978-1-5225-8431-5.ch014.
- [6] Council of the European Union, "Council recommendation of 22 May 2018 on key competences for lifelong learning," *Official Journal of the European Union*, pp. 1–13, 2018.
- [7] OECD and Asia Society, *Teaching for global competence in a rapidly changing world*. Paris: OECD Publishing, 2018, doi: 10.1787/9789264289024-en.
- [8] S. Albahli, "Advancing sustainable educational practices through AI-driven prediction of academic outcomes," *Sustainability*, vol. 17, no. 3, p. 1087, Jan. 2025, doi: 10.3390/su17031087.

- [9] A. V. Y. Lee, S. C. Tan, and C. L. Teo, "Designs and practices using generative AI for sustainable student discourse and knowledge creation," *Smart Learning Environments*, vol. 10, no. 1, p. 59, Nov. 2023, doi: 10.1186/s40561-023-00279-1.
- [10] D. Baidoo-Anu and L. O. Ansah, "Education in the era of generative artificial intelligence (AI): understanding the potential benefits of ChatGPT in promoting teaching and learning," *Journal of AI*, vol. 7, no. 1, pp. 52–62, Dec. 2023, doi: 10.61969/jai.1337500.
- [11] G. Cooper, "Examining science education in ChatGPT: an exploratory study of generative artificial intelligence," *Journal of Science Education and Technology*, vol. 32, no. 3, pp. 444–452, Jun. 2023, doi: 10.1007/s10956-023-10039-y.
- [12] C.-C. Lin, A. Y. Q. Huang, and O. H. T. Lu, "Artificial intelligence in intelligent tutoring systems toward sustainable education: a systematic review," *Smart Learning Environments*, vol. 10, no. 1, p. 41, Aug. 2023, doi: 10.1186/s40561-023-00260-y.
- [13] S. Ahmad, M. I. Hussain, and M. M. R. K. Kushwaha, *Transforming learning: the power of educational technology*. New Delhi: Bluerose Publishers, 2024.
- [14] C. Zhai, S. Wibowo, and L. D. Li, "The effects of over-reliance on AI dialogue systems on students' cognitive abilities: a systematic review," *Smart Learning Environments*, vol. 11, no. 1, p. 28, Jun. 2024, doi: 10.1186/s40561-024-00316-7.
- [15] J. Flodén, "Grading exams using large language models: a comparison between human and AI grading of exams in higher education using ChatGPT," *British Educational Research Journal*, vol. 51, no. 1, pp. 201–224, Feb. 2025, doi: 10.1002/berj.4069.
- [16] I. Saputra, A. Kurniawan, M. Yanita, E. Y. Putri, and M. Mahniza, "The evolution of educational assessment: how artificial intelligence is shaping the trends and future of learning evaluation," *The Indonesian Journal of Computer Science*, vol. 13, no. 6, pp. 9056–9074, Dec. 2024, doi: 10.33022/ijcs.v13i6.4465.
- [17] T. K. Koo and M. Y. Li, "A guideline of selecting and reporting intraclass correlation coefficients for reliability research," *Journal of Chiropractic Medicine*, vol. 15, no. 2, pp. 155–163, Jun. 2016, doi: 10.1016/j.jcm.2016.02.012.
- [18] O. D. Bakare-Fatungase, F. E. Adejuwon, and T. O. Idowu-Davies, "Integrating artificial intelligence in education for sustainable development," in *Using Traditional Design Methods to Enhance AI-Driven Decision Making*, T. V. T. Nguyen and N. T. M. Vo, Eds., Hershey, PA: IGI Global Scientific Publishing, 2024, pp. 231–245, doi: 10.4018/979-8-3693-0639-0.ch010.
- [19] M. L. Owoc, A. Sawicka, and P. Weichbroth, "Artificial intelligence technologies in education: benefits, challenges and strategies of implementation," in *IFIP International Workshop on Artificial Intelligence for Knowledge Management*, 2021, pp. 37–58, doi: 10.1007/978-3-030-85001-2\_4.
- [20] C. N. Couto, "Exploring technology and AI in intercultural citizenship education," *International Journal of Digital Society (IJDS)*, vol. 15, no. 1, pp. 1925–1933, Mar. 2024, doi: 10.20533/ijds.2040.2570.2024.0241.
- [21] R. B. Nemakhavhani, "Enhancing student engagement through problem-based learning," *International Conference on Education Research*, vol. 1, no. 1, pp. 238–245, Nov. 2024, doi: 10.34190/icer.1.1.3053.
- [22] D. Boud, R. Ajjawi, P. Dawson, and J. Tai, *Developing evaluative judgement in higher education*. Abingdon, UK: Routledge, 2018.
- [23] M. St. Fountoulakis, "Evaluating the impact of AI tools on language proficiency and intercultural communication in second language education," *International Journal of Second and Foreign Language Education*, vol. 3, no. 1, pp. 12–26, Oct. 2024, doi: 10.33422/ijsfle.v3i1.768.
- [24] S. Yang, H. Zhao, and W. Luo, *The impact of artificial intelligence on intercultural communication*. London: IntechOpen, 2024, doi: 10.5772/intechopen.1006172.
- [25] V. Gercar, "Intercultural fluency: a critical soft skill in today's global world," Illinois State University, 2019. Accessed: Sep. 1, 2025. [Online]. Available: <https://news.illinoisstate.edu/2019/03/intercultural-fluency-a-critical-soft-skill-in-todays-global-world/>
- [26] A. Simões, "Preparing students for the global workplace," in *ICERI2020 Proceedings*, pp. 7962–7971, doi: 10.21125/iceri.2020.1765.
- [27] H. Adams, S. Blackburn, and N. Mantovani, "Psychological resilience for climate change transformation," *Current Opinion in Environmental Sustainability*, vol. 50, pp. 303–309, Jun. 2021, doi: 10.1016/j.cosust.2021.06.011.
- [28] L. Chiu, "Climate change and mental health," *Australasian Psychiatry*, vol. 31, no. 6, pp. 795–797, Dec. 2023, doi: 10.1177/10398562231211115.
- [29] L. Dunlop and E. A. C. Rushton, "Education for environmental sustainability and the emotions," *Sustainability*, vol. 14, no. 8, p. 4441, Apr. 2022, doi: 10.3390/su14084441.
- [30] B. Cope, M. Kalantzis, and D. Searsmith, "Artificial intelligence for education: knowledge and its assessment in AI-enabled learning ecologies," *Educational Philosophy and Theory*, vol. 53, no. 12, pp. 1229–1245, Oct. 2021, doi: 10.1080/00131857.2020.1728732.
- [31] D. Carless, "From teacher transmission of information to student feedback literacy: activating the learner role in feedback processes," *Active Learning in Higher Education*, vol. 23, no. 2, pp. 143–153, Jul. 2022, doi: 10.1177/1469787420945845.
- [32] A. Sala, Y. Punie, V. Garkov, and M. C. Giraldez, *LifeComp: the European framework for personal, social and learning to learn key competence*. Luxembourg: Publications Office of the European Union, 2020.
- [33] Center for Universal Education and the Youth Advocacy of the Global Education First Initiative of the United Nations, "Measuring global citizenship education: a collection of practices and tools," 2017. [Online]. Available: [https://www.brookings.edu/wp-content/uploads/2017/04/global\\_20170411\\_measuring-global-citizenship.pdf](https://www.brookings.edu/wp-content/uploads/2017/04/global_20170411_measuring-global-citizenship.pdf)
- [34] A. Belyh, "Understanding cultures & people with Hofstede dimensions," *Cleverism*, 2019. Accessed: Nov. 1, 2025. [Online]. Available: <https://www.cleverism.com/understanding-cultures-people-hofstede-dimensions>
- [35] E. Meyer, *The culture map: breaking through the invisible boundaries of global business*, 1st ed. New York: PublicAffairs, 2014.
- [36] H. de Wit and P. G. Altbach, "Internationalization in higher education: global trends and recommendations for its future," *Policy Reviews in Higher Education*, vol. 5, no. 1, pp. 28–46, 2021, doi: 10.1080/23322969.2020.1820898.
- [37] M. Esen, "Critical thinking and intercultural competence: review, use, and classification of the 21st century skills in intercultural EFL education," *International Journal of English Language Teaching*, vol. 8, no. 1, pp. 23–32, 2021, doi: 10.5430/ijelt.v8n1p23.
- [38] United Nations, "Sustainable development goals – 17 goals to transform our world," United Nations Sustainable Development. Accessed: Aug. 1, 2025. [Online]. Available: <https://sdgs.un.org/goals>
- [39] World Economic Forum, *The future of jobs report 2023*. [Online]. Available: <https://www.weforum.org/reports/the-future-of-jobs-report-2023/>
- [40] L. F. Gómez-Rodríguez, "Implementing critical thinking tasks to fostering English learners' intercultural communicative competence in a genre-based learning environment," *English Language Teaching*, vol. 11, no. 12, pp. 154–165, Nov. 2018, doi: 10.5539/elt.v11n12p154.
- [41] A. Advani, "Education 4.0: Here Are 3 Skills That Students Will Need For The Jobs of The Future," World Economic Forum, 2023. Accessed: Sep. 1, 2025. [Online]. Available: <https://www.weforum.org/agenda/2023/01/skillsets-cultivated-by-education-4-0-davos23/>

**BIOGRAPHIES OF AUTHORS**

**Sofiya Nikolaeva**    is doctor of Pedagogical Sciences, professor, honored worker of Education of Ukraine, Honorary Doctor of Kyiv National Linguistic University, professor in the Department of Pedagogy and Methods of teaching foreign languages of the Kyiv National Linguistic University, Ukraine. She is the head of the scientific school “Kyiv Methodological School”, the head of a specialized scientific council, and a member of the editorial board of three scientific journals. The research interests cover individualization and differentiation of teaching foreign languages, autonomy training foreign languages and cultures, pedagogy, and psychology. She can be contacted at email: [nikolaeva.ku@gmail.com](mailto:nikolaeva.ku@gmail.com).



**Yana Diachkova**    is an Ph.D. (in Education), associate professor in the Department of Foreign Languages of the Faculty of Economics of Taras Shevchenko National University of Kyiv, Ukraine. She participated in the NATO Professional Development Project in Ukraine as an English teacher for the military and was involved as an English teacher in the national project for the development of entrepreneurship and export Diya.Business, which is implemented by the Ministry of Digital Transformation of Ukraine. Her research interests include contemporary higher education trends, methodology of teaching English for Specific Purposes, and the use of modern technologies and instruments in education. She can be contacted at email: [yanadyachkova24@gmail.com](mailto:yanadyachkova24@gmail.com).



**Anastasiia Syzenko**    is an Ph.D. (in Philology), associate professor in the Department of Foreign Languages of the Faculty of Economics of Taras Shevchenko National University of Kyiv, Ukraine. She is a certified trainer from The British Council (Ukraine). Her research interests include internationalization of higher education, the use of learning technologies and new developments in teaching English for specific purposes. She can be contacted at email: [anastasia.syzenko@gmail.com](mailto:anastasia.syzenko@gmail.com).