

# The impact of generative AI on higher education

Voices from the field

Anna Esaki-Smith

Lindsay Addington, EdD



**duolingo** english test

# Introduction

Higher education is undergoing a transformative shift with the emergence of generative artificial intelligence (AI) technologies, which are capable of producing interactive conversational experiences that can be integrated into various aspects of higher education, from virtual tutoring and language learning to content generation and personalized feedback. Generative AI has profound implications for pedagogy and the future of learning.

The impact of AI is not without concerns and limitations for the higher education sector, which include algorithmic bias, academic integrity and data protection. There is also worry over the potential lack of human interaction in the learning process and possibly fewer opportunities for students to develop critical thinking skills. Powerful language models such as GPT-3 and ChatGPT are already being used in higher education; with increased ability to perform more complex tasks with greater accuracy, GPT-4 has the potential to radically transform the sector. As AI becomes further integrated into higher education, we must critically evaluate its benefits and drawbacks in order to develop proper guidelines for ensuring that it is used responsibly.

In this qualitative study, we collected perspectives and insights from experts involved in both higher education and technology, to capture the current zeitgeist in a quickly-evolving landscape. The voices we canvassed are varied – ranging from admissions professionals to university students and AI experts. However, despite that diversity, the opinions expressed about technology overall are uniform: As we continue to evolve and adapt to new technologies, the focus should be less on what we can do with AI and more on what we should do.

## About Duolingo

Duolingo is the most popular language-learning platform and the most downloaded education app in the world, with more than 500 million users. The company's mission is to make education free, fun, and available to all. In addition to its core platform, the company created the Duolingo English Test (DET) in 2016, an affordable and convenient language certification option that is accepted by thousands of higher education institutions globally. The DET leverages human-in-the-loop AI to create a more secure high-stakes test.

The insights explored in this paper precede an expert panel being held in May '23 at the Duolingo headquarters in Pittsburgh, PA. A discussion among recruitment, admissions, and enrollment professionals from colleges and universities in the US, UK, Canada and Australia will follow to further explore the impact of generative AI on higher education.

# Voices from the field

## University admissions and the classroom

The rapid and widespread use of ChatGPT by students in college applications has the potential to upend long-established parameters of the admissions process. Universities across the globe have used the college essay as a key metric in determining whether an applicant would be a good fit for the institution.<sup>1</sup> Now that so many students can easily access an AI-enhanced text generating tool, we can no longer be confident that these essays will reflect students' authentic writing ability. In addition, generative AI might change how students learn in high school, which in turn will influence their skills and abilities when they start college.

"There are two overarching questions," said John Wilkerson, Associate Vice President for International Services at Indiana University. "One of them is, how has AI impacted students' secondary school curriculum and performance? And the other area is regarding language acquisition. Are we seeing essays that accurately depict writing abilities?"

Wilkerson believes issues such as academic integrity and potential biases in AI tools like ChatGPT could become priority discussions at universities, especially because access to the most-cutting-edge services, such as those powered by the more-advanced GPT-4, currently require a fee.

"Academic integrity is a term that we will have to redefine," he said. "And since the best GPTs are paid-for services, is there a disadvantage inherently present there?"

The admissions process for programs that require strong English language skills, like journalism and marketing, will be particularly influenced by the onset of generative AI. Julie Collins, Assistant Dean of Graduate Admissions & Financial Aid at Northwestern Medill, is tracking how the English skills of international applicants, who make up a significant percentage of the applicants to Medill's marketing program, can be accurately assessed through their applications.

"Being a journalist demands deadline-driven reporting and a high level of English competency," she said. "The same thing goes for our marketing communications program, where there's a lot of public speaking and teamwork. And it's a matter of utilizing more than one skill set at the same time, like listening and writing in tandem. If you've never done this in English before, it will be a challenge."

Collins notes that in applications, college essays are often evaluated alongside English language test scores, such as from the Duolingo English Test or the Graduate Record Examinations test, both of which serve as benchmarks

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**John Wilkerson**, Associate Vice President for International Services at Indiana University

1 "What Colleges Look For: 6 Ways to Stand Out." U.S. News & World Report, September 14, 2021. Accessed May 5, 2023. <https://www.usnews.com/education/best-colleges/applying/articles/what-colleges-look-for-ways-to-stand-out>

in assessing an applicant's language ability. She anticipates potential disconnects between a proficiency level represented by a test score and the quality of an essay on an admissions application.

"If we have an essay that indicates the English language ability is there, but the testing says something totally different, that's our first warning sign that something might be amiss," Collins said. She also notes that using generative AI to write essays might result in text that doesn't exactly answer specific prompts.

"If applicants use the same keywords to generate text, we might get essays that won't align to the questions asked in the application," she said, adding that there might be a sameness, too, to AI-generated text should students use the same prompt. "Can ChatGPT come up with 900 unique essays?" Collins asked.

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**Julie Collins**, Assistant Dean of Graduate Admissions & Financial Aid at Northwestern Medill

Both Wilkerson and Collins see potential AI benefits for students. Wilkerson says that ChatGPT's inquiry function can help students find specific information quickly, such as details regarding scholarships and curriculums. As a result, the role AI will play may also profoundly affect—and even disrupt—the field of independent education consultants and agents, replacing the tailored application services that they've historically provided to students.

Confronted with such substantial disruption, higher education, which can be slow to adapt to change, might be forced to become more responsive. AI will help professors with grading and assessments, thus freeing up time for more robust student engagement.

And, when evaluating international student applicants, having the support of AI in researching the credentials and curriculums of overseas high schools has the potential to streamline the evaluation processes.

"There is a significant opportunity for AI to serve as an efficiency-gainer and to change the pace of evolution in education," Wilkerson said.

Collins believes the tool will give even more support to international students, who are eager to maximize their overseas study opportunities. "International students want to use all the tools available to them to be successful in this admissions process to go to that top-tier school." Studying abroad at a desirable university "has been a goal and could be a game-changer for them and even their family," she said.

But, while she is sympathetic to the stresses international students face when preparing college applications, the focus should be on admitting students who can thrive when they come to campus. The optimal use of generative AI is not to misrepresent a student's true ability.

"We understand the cultural nuances around support and assistance when it comes to an application," Collins added. "But at the same time, universities want students to be successful in their programs. The onus is on the school to convey that message."

Changes will be deeply felt in the university classroom as well. Associate Professor Andrew Moore teaches in the Great Books program at St. Thomas University, a university unique in Canada for its focus on the liberal arts. Great Books is an interdisciplinary program that covers a wide range of subjects, such as philosophy, political theory, literature and poetry— all areas that will potentially be impacted by AI.

As referenced earlier by a university admissions officer, the impact of AI will be evident before students set foot on a university campus.

“What’s clear is this is going to change a lot of what we do in education,” Moore said, adding that those changes will be particularly felt at the high school level and in general composition classes. He also highlighted that universities who require their engineering or STEM students to take writing courses may face challenges in light of these changes.

“What this tool does is it can bring someone up to a level of perceived competency very quickly, almost instantly,” he said.

Indeed, as with the college essay, the authenticity of a student’s work will come under increased scrutiny. Moore believes that certain types of questions or assignments that were previously used to assess reading comprehension or basic understanding of concepts may no longer be effective, as the tool can easily reproduce content. “We’re no longer testing what we think we’re testing,” he said.

Despite the potential challenges and changes, Moore believes most students, especially those at a school specializing in the liberal arts, will embrace AI more as a tool to help with their writing, rather than a way to get out of doing assignments.

“I don’t think students are excited about never needing to write an essay again,” he said. He also added that decisions about how best to use AI are not unique to students and could extend to professors.

“At what point does it take more time and effort to set up the parameters and descriptions on ChatGPT than to write a memo yourself?” he said. “Where do you find that balance?”

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**Andrew Moore**, Associate Professor, Great Books program at St. Thomas University



## International students

How university students will use generative AI when submitting applications and completing their assignments is a focus and concern in the sector. Unsurprisingly, the university students interviewed for this paper had all used ChatGPT, and reported their fellow students were using it as well. While they voiced awareness about the potential for “cut and paste” plagiarism when using the tool, they lacked clear guidance on what universities consider an allowable percentage of AI-generated content in a written assignment. And student views varied as to the impact of AI on a more macro-scale.

Nafiz Ibrahim, a student from Bangladesh majoring in computer science at Australia’s Monash University, said he had previously used IBM’s AI tool Watson, but the capacity of that software has been eclipsed by the sophistication and breadth of ChatGPT.

“ChatGPT can work on any topic and the data is endless,” Ibrahim said. “To have a tool that can directly answer all your questions, and most importantly, can teach you coding or any related subject in a very basic way for everyone to understand, that’s pretty amazing.”

Ibrahim believes that the immediate responses provided by ChatGPT have made learning more accessible. “You can ask this professor [ChatGPT] anything and he will answer straight away, without having to wait for a week for an email reply,” he said. However, as a computer science major, he is wary about depending on AI for significant assignments. “I would use it to understand day-to-day basic concepts,” he said, adding that it should not replace traditional learning and should be used responsibly.

Indeed, as is the concern with college admissions officers reviewing college essays, if a class full of students use ChatGPT to write an assignment, the generic sameness of their work may raise suspicions.

“If everyone submits the exact same prompt [to ChatGPT], the responses are going to be really similar to the point where the professors are probably going to notice,” said Gabriella Sally, an Indonesian student at Babson College studying business administration.

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**Nafiz Ibrahim**, Australia’s Monash University

Gabriella currently uses ChatGPT to summarize readings as well as to brainstorm ideas while working as an intern at her college’s marketing department. “ChatGPT will definitely change the way people work,” she said. “The speed will be different, and everything will evolve a lot faster.”

While there may be changes in micro-level interactions and the efficiency of processes, some students don’t believe Generative AI will have the same impact on the macro scale. “In terms of structures and societies, those will remain the same,” Gabriella said. “Will it really change how the world works? I don’t think so.”

The limitations of what ChatGPT specifically, and generative AI in general, can offer is evident in some majors. Ziyad Shamsadeen, an Iraqi graduate student in civil engineering at Canada's University of New Brunswick, said a good example is how some types of engineering require real world experience and practical knowledge. The process of building bridges and similar infrastructure, for instance, demands an element of in-person engagement.

"Engineering is more than just research, it's a hands-on science," Ziyad said. "If you don't have practical knowledge as an engineer, if you don't have that kind of know-how, it's not very useful."

He also believes that access to generative AI tools like ChatGPT should be limited to users who have achieved a certain level of education. Without knowing how to properly use the tool, he is concerned that users may promote misinformation or skip over critical building blocks of their educational foundation. Further, the full capacity of ChatGPT hinges on "prompt engineering," or knowing how to pose the right questions for accurate results, and that also demands a level of education, Ziyad added.

While Ziyad didn't feel the imminent threat of AI automating jobs, he anticipated great changes in the future. "It's already started making changes, and those changes will be exponential," he said. "If AI learns 'one' today, tomorrow it'll learn 'two' and the next day 'four,' and then 'eight.' So even if it hasn't affected me yet, I'm sure it'll affect me very, very soon. It's coming for all of us."

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**Ziyad Shamsadeen**, Civil engineering graduate student, University of New Brunswick



## Experts at the forefront of AI

For those directly involved in integrating AI into higher education, the opportunities it presents are numerous. The experts interviewed for this paper — who work in testing, plagiarism detection and the ethical issues with regards to data — agree that the impact of these opportunities has already been significant.

In educational assessment, AI allows test developers to leverage technology to automate certain tasks, resulting in increased efficiency. For example, Duolingo English Test (DET) engineers have trained AI using examples created by assessment experts to generate and filter content for test items in an iterative process that can create hundreds of thousands of questions in a short period of time.

While AI has the power to generate this content at scale, Alina von Davier, Chief of Assessment at Duolingo, said that having a “human in the loop” in this process is critical to ensure that the content meets test developers’ high standards. In addition, the experts now freed from repetitive tasks can focus on the important responsibility of overall test design, thus amplifying human expertise.

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**Alina von Davier**, Chief of Assessment at Duolingo

“It’s about leveraging the expertise of human designers and the capabilities of AI to create high-quality test items efficiently,” Von Davier said. And to do so according to the highest-standards.

Indeed, DET research teams use Responsible AI Standards<sup>2</sup> to conduct on-going auditing of test processes for design, measurement, and security, conduct validity and reliability studies, and maintain documentation. To ensure for the test’s overall validity with regard to use of AI, rationales for establishing benchmarks and goals to achieve in these areas are chronicled for reference. These criteria regarding AI are not unique to the Duolingo English Test and likely applicable within the sector.

AI has opened up opportunities both for practitioners and learners. Klinton Bicknell, Head of AI at Duolingo, said that with the advent of GPT-4, it has become easier for people without deep experience in AI to work with it, which has expanded possibilities in the field to more people. In addition, with the personalization that can be done via AI, the learning experience has the potential to become more engaging and impactful.

“AI can help people practice exactly the kinds of skills that they want, which is something that previously you could not do without a private tutor,” Bicknell said. “And now, based purely on technology, people can learn and practice things in an interactive way.”

Rumman Chowdhury is a Responsible AI Fellow at the Berkman Klein Center for Internet & Society at Harvard University and former Director of ML Ethics, Transparency and Accountability at Twitter. She believes that the ed-

2 Burstein, Jill. (2023) Duolingo English Test: Responsible AI Standards. Duolingo. 4-14.



educational system needs to adapt to the new environment and prepare students with relevant skills, including the effective use of technology. In her view, tools like ChatGPT can be beneficial and raise the bar for students.

“We need to be smart and incorporate these tools into how students learn because it is a reality of the world,” Chowdhury said.

She added that despite the challenges that surface, it is better to embrace technology than to try to ban or prevent its use. Learning skills such as “prompt engineering” and how to critically interrogate generated information will become increasingly important, as students must learn to use AI systems intelligently.

“The issue of provenance is something that comes up a lot with generative AI,” said Chowdhury. Students should learn not only to ask ChatGPT for information, but to follow up to ensure the correctness of the information. “Quite literally, [students must ask themselves] what is the source of the information you are seeing?” she added.

The training data used for AI models, such as conversations on the social platform Reddit,<sup>3</sup> can be concerning, as the embedded biases these conversations reflect may not mirror perspectives outside of the tech industry in the US, Chowdhury said. “It’s not just that the data can be biased because society is biased,” she said. “It is also that the very people making the content are not reflective of the population they are addressing.”

Chowdhury said specifically because of these complexities, there needs to be a humanistic understanding of how AI is changing education. “What we are asking people to do is critically interrogate an algorithmic system” and to determine best practice, she said. “Responsible AI tends to live in a world of people trying to do the right thing.”

Undoubtedly, one of the biggest concerns in the sector is the potential for students to use generative AI to complete their written assignments. And while plagiarism detection programs already exist, the nature of generative AI essentially requires the development of entirely new software.

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“The original Turnitin lets you identify sections of text that are word-for-word matches with some external source, and you can point the instructor at that specific source,” said David Adamson, Principal Machine Learning Scientist at Turnitin, a company that focuses on academic integrity. “That’s not how ChatGPT and its cousins work.”

If students use AI tools to paraphrase text from a specific source, Turnitin can still help instructors identify the source, said Adamson. “But straight-up AI writing detection, predicting whether a text represents an authentic student voice or what’s likely ChatGPT, is a very different question,” he added. “We really had to build from the ground up.”

3 “Reddit’s AI Moderation System Goes Open Source with Help from OpenAI and Google,” The New York Times, April 18, 2023, accessed May 5, 2023, <https://www.nytimes.com/2023/04/18/technology/reddit-ai-openai-google.html>.

The Turnitin team trained their AI writing detection model on a combination of secondary writing, higher educational writing, and published academic papers. This approach allows for more precise detection of AI-generated writing in an academic setting, taking into consideration different writing styles and levels of complexity.

Adamson - who was previously a high school teacher - acknowledges that lower level composition, such as middle school writing, can be fairly simple and predictable, leading to a slightly higher false positive rate in detecting AI-generated writing than on more complex writing, around one percent. Ultimately, he hopes that software like Turnitin will be viewed less as catch-all "combat" tools and more within an educational context.

**"As people start using these tools, the expectations for how you write in the classroom or how you do any assignment in the classroom will change"**

**David Adamson**, Principal Machine Learning Scientist at Turnitin

"We are really trying to emphasize that this is an exploration and understanding tool," Adamson said. He emphasized there was potential for such software to help students adapt their writing approach to ensure their work is original and, as a result, to improve their critical thinking skills. "As people start using these tools, the expectations for how you write in the classroom or how you do any assignment in the classroom will change," he said.

## **Looking ahead to a new normal**

The emergence of generative AI technologies has already changed higher education significantly, and these changes will only increase in the future. As the interviewees of this research paper have expressed, these advancements will revolutionize the way we approach education, while at the same time raising ethical concerns.

AI technology should be used to complement and enhance the learning experience, not to replace human interaction and critical thinking skills. Students, practitioners, and experts agree that the focus should be on using AI in ways that add value to learning rather than relying solely upon it to write text. To better understand and address the ethical implications of AI systems, we must better understand the potential biases in training data and prompt engineering. To achieve this, it will take a multidisciplinary approach, including social sciences and humanities, to more fully grasp the implications of AI.

As AI technology continues to evolve, we must continue to evaluate its impact on higher education and develop guidelines to ensure its responsible use. The integration of AI into higher education is an exciting development that has the potential to revolutionize and personalize the way students learn. The benefits are numerous, including the potential for higher faculty engagement with students, broader access to education overall, and increased opportunities for self-study. By embracing the opportunities offered by AI and using it responsibly, we can create a better learning experience for all students.

## About the authors



**Anna Esaki-Smith** is a global education strategist with deep experience in international student recruitment, partnership development and thought leadership. Her young adult book, *Make College Your Superpower*, will be published in spring 2024 by Rowman & Littlefield. She has a bachelor's degree from Cornell University and a master of science from the Columbia University Graduate School of Journalism.



**Lindsay Addington, EdD**, joined the Duolingo English Test in 2021. She brings her vast experience as a university admission officer and higher education association professional to the team where she focuses on recognition of the exam among U.S. graduate programs. Lindsay holds her master's and doctorate in higher education administration from the George Washington University and a bachelor's in communication from the University of Delaware.

