

KNOWLEDGE ASSESSMENT AS AN INTEGRAL COMPONENT OF DISTANCE LEARNING USING GENERATIVE AI SOLUTIONS

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The growing market of AI/LLM-based solutions has already impacted the ability to generate content of various kinds, thus affecting teachers (especially in so-called "distance learning") in truly understanding the level of knowledge a particular student has in a specific subject. Is this a problem or an opportunity for both teachers and students?

It is already known that combining (in this case, deeply trained) AI with a competent user accelerates learning, improving productivity and quality by as much as 40% in some studies [1], thus highlighting the potential transformative impact of this technology in learning environments. China, India, and the US are the leading countries researching AI in the area of online learning and distance education [2], eager to build on what has been learned so far in order to guide AI toolsets appropriately into formal education as a means of attracting native and foreign students who cannot be physically present.

A primary concern for such education often lies in the shadows of the word "distance": how can one guarantee that a student is not cheating during exams? How can educators be certain that a student has genuinely acquired the necessary knowledge from the course, rather than merely copying and pasting correct test answers from others or the Internet?

For instance, The Educational Testing Service (ETS), the owner and producer of the world-class TOEFL tests for assessing an individual's ability to communicate in English, introduced At-Home Solutions [3] in response to the Coronavirus pandemic and the increasing number of test-takers.

However, with thousands seeking certification daily, ETS must provide a unique experience for each individual, assessing grammatical correctness, verbal communication, comprehension, and the ability to gather, summarise, and utilise information. Each section requires the involvement of diverse talents, ranging from highly qualified English teachers to voice actors with proper diction and accents. Furthermore, ETS requires exceptionally skilled professionals to listen to applicants' audio responses and accurately assess their English proficiency level.

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Clearly, ETS will require a large, high-quality dataset of potential questions, but ETS itself is a well-known, established enterprise with access to adequate funding and professionals. However, costs will definitely increase in proportion to the number of test takers.

Consequently, it becomes clear that if a business aims to impart knowledge via distance learning, it should be capable of rapid growth on demand – or risk losing potential customers to competitors. Globalisation, more affordable internet access, and portable electronic devices have made it feasible to acquire customers or students globally, provided that the knowledge course is sufficiently interesting.

Consider a scenario involving a small English-teaching school that recently transitioned to online learning and installed a Learning Management System (LMS), such as Moodle. With 30-40 people enrolled in the course, there is no problem at all; the school can create a unique experience for each student. The education process is going well, students are happy, the business attracts positive media coverage, and suddenly the school sees 30,000–40,000 filled application forms on its virtual doorstep – and here lies the problem. Despite having a talented team of teachers, the school is unable to prepare sufficient quality test material in the short term. Even if the school were to create the necessary set of test questions, it is not humanly possible for the small team to verify responses in a timely manner. The school considers hiring more teachers – but this is not a fast process, as the school has very demanding quality standards.

Potential customers are frustrated because the school cannot accept everyone.

On the other hand, students become familiar with each other and initiate communication outside of class: exchanging materials and answering test questions – all forms of cheating, so the school needs to be ahead of them and constantly renew material. Moreover, the school is facing another potential problem: ChatGPT, Google Bard, and other LLM-based commercial solutions that can generate a perfect English essay in a matter of seconds or hint correct answers for test questions. Using such tools effectively diminishes the value of the course and completion certificates.

This situation necessitates a strategic approach and the development of affordable alternatives. There are dozens of LLM/Generative AI solutions on the market; they can generate large chunks of human-like text, images, swap faces, generate dubbing in different languages and accents, and much more.

However, LLM-based solutions can be not only our rivals but also allies when creating new content – and that speeds up the educational process dramatically. For example, ChatGPT v4 is capable of directly generating B2-level English in the Moodle GIFT [4] format. A special module for the

learning system that communicates directly with ChatGPT can be developed. Teachers will simply input the required number of questions, thematic areas, and other course-specific instructions. The module performs ChatGPT's HTTP API calls, parses the answers, and presents the results in the UI.

A common area of language assessment is audio comprehension, where students listen to a conversation between two or three people, understand and memorise key facts, and then answer questions or express opinions on the subject. As Learning School managers, we need to prepare: a) a screenplay; b) voice actors; c) correct responses, and require teachers to listen to and validate recorded student responses for accuracy. How can LLM/Generative AI assist in this scenario?

We would need a series of tools: a) ChatGPT to create 20 screenplays with correct answers; b) a voice AI generation tool to produce the actual dialogue with different accents, if necessary; c) a voice-to-text tool to translate students' audio responses back to plain text; and d) ChatGPT to verify the correctness and propose a grade to the teacher. Teachers will see the transcription of the student's audio (faster than listening to it) and the original conversation, making it easier to determine the final grade.

Of course, each tool may introduce errors, which is an important fact that should not be overlooked. However, AI, performing the 'heavy lifting', will aid in generating new, unique content for each student and even assist our teachers in grading. Undoubtedly, this will facilitate the scaling up of educational services.

Our imaginary LMS module could even introduce a new type of assessment question, for example: 'Listen to the conversation between two friends discussing the picture above. Please agree or disagree with them.' The picture description, the image itself, and key points for the conversation will be AI-generated, and student responses will be processed as described above.

Generative AI has already become a challenge for distance learning; therefore, teachers should be adept at identifying cheating. For English learners, telltale signs include B1 level students using B2-level vocabulary, producing extensive texts without errors, or recording audio without natural, human-like sounds such as 'uh', 'um', with perfectly timed pauses. The industry has introduced tools such as GPTZero to detect AI-generated text content, but they are not flawless and should be used cautiously. Ironically, services for circumventing AI detectors are also available.

Technologically, distance learning software will increasingly use AI to generate unique content and for grading (either directly or as a recommendation to the teacher). A significant portion of the grading process will involve ensuring the authenticity of student responses – using detection software services that require constant updates. We should anticipate specific regulations

for remote exams. One of the industry leading enterprises, ETS, has already established a very strict protocol for remote tests [5].

Many rules are implemented solely to ensure that the actual test content does not appear in Google search results, and this is entirely justifiable: if someone were able to anticipate questions or know precisely what to expect, it would confer a significant unfair advantage and undermine ETS's business model, effectively nullifying the value of the TOEFL certificate.

Teachers will be encouraged to prepare content in an AI-friendly format that can be used for deep learning (ChatGPT, for example, already offers an API for fine-tuning datasets for specific companies). Even the most extensive LLM model cannot 'know everything' and may generate errors, especially in specialised fields such as technical or medical courses. Currently, the market lacks a 100% error-free AI solution, so all AI-generated results should be approached with caution and validated manually by trained professionals.

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