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AI AS A TEACHING ASSISTANT: AN INNOVATIVE APPROACH TO EDUCATION THROUGH CUSTOMIZED MODEL ANSWER GENERATION AND GUIDED PRACTICE

ABSTRACT. Ołędzka Monika, Benesio Carace Mark, de Oliveira Tomaz Susana, Pan Benny, Jiang Pengfei, *AI as a Teaching Assistant: An Innovative Approach to Education Through Customized Model Answer Generation and Guided Practice* [Sztuczna inteligencja jako asystent nauczyciela: Innowacyjne podejście do edukacji poprzez generowanie dostosowanych odpowiedzi modelowych i wspomagana praktykę.] *Studia Edukacyjne* no. 74, 2024, Poznań 2024, pp. 67-79. Adam Mickiewicz University Press. ISSN 1233-6688. Submitted: 10.12.2024. Accepted: 30.12.2024. DOI: 10.14746/se.2024.74.4

Artificial Intelligence (AI) is rapidly becoming an integral tool in modern education, offering opportunities to personalize learning, optimize teaching strategies, and enhance critical thinking skills. This

paper explores the role of AI as a teaching assistant, focusing on the project “*Generating Customized Model Answers as Revision Guides Using AI*” conducted within the 17th ASEF Classroom Network School Collaboration. The study analyzes the impact of AI-generated model answers on student preparation for exams, highlighting improvements in student performance, particularly in tasks requiring analysis and synthesis of information. Through personalized feedback, adaptive content delivery, and interactive simulations, AI fosters deeper analytical engagement and prepares students for real-world challenges. Despite its transformative potential, the study emphasizes the importance of complementing AI with traditional teaching methods to fully develop students’ skills. Additionally, the ethical considerations of aligning AI systems with human values remain critical to ensuring their positive societal impact. This research underscores AI’s pivotal role in the future of education while advocating for its responsible implementation.

Key words: Artificial Intelligence (AI), personalized learning, critical thinking, education innovation, adaptive teaching, model answer generation, ASEF Classroom Network, educational ethics, student performance, teaching assistant technology

Artificial Intelligence (AI) is becoming a pivotal tool in modern education, driving innovations in teaching and learning. Research indicates that AI has the potential to revolutionise education, playing a significant role in transforming instructional design and student learning by personalising learning experiences, providing real-time feedback, and creating highly interactive and engaging learning environments, thereby enhancing student readiness for the future (Yue et al., 2022). Its ability to personalize learning, optimize teaching strategies, and prepare students for technological advancements is counterbalanced by challenges of alignment with human values and ethical considerations (Tahiru, 2021).

Max Tegmark in *Life 3.0* (2017) categorizes the evolution of life into three stages: biological, cultural, and technological. The third stage, *Life 3.0*, epitomizes the role of AI in fostering superintelligence capable of reshaping education. Tegmark emphasizes the necessity of designing AI systems that reflect human values, ensuring their integration benefits humanity. In education, this translates to AI tools that not only optimize learning outcomes but also respect diversity and foster inclusivity. His call for global cooperation to develop ethical AI frameworks resonates strongly in the field of education, where equitable access to technology is crucial. Stuart Russell, in *Human Compatible* (2019), underscores the need for AI systems that complement human capabilities. This approach aligns with education’s focus on enhancing students’ potential rather than replacing teacher roles. Russell advocates for AI that supports critical thinking and decision-making, fostering skills essential in the knowledge economy. Tools like AI-driven tutoring systems, which adapt to individual learning paces, exemplify this principle by bridging gaps in understanding. In September 2024, UNESCO published the The Unesco AI competency framework for both teachers and student. Both frameworks have been developed by a global cross-functional team to support the devel-

opment of competencies to empower the education community to develop, not just the AI literacy but also the skills required to deploy the safe, ethical and effective use of AI through a human-centered approach while promoting inclusivity.

The application of AI in education particularly pertains to the assessment of students' knowledge. As noted by Bulut et al. (2024) in their work *The Rise of Artificial Intelligence in Educational Measurement*, AI tools can automate evaluation, generate personalized feedback, and create adaptive tests that adjust to a student's proficiency level. However, the authors also point out that the use of AI carries the risk of reduced transparency in assessment and the potential introduction of biases into educational systems.

Farahani (2024), in their article *Artificial Intelligence in Education: A Comprehensive Study*, discusses various aspects of implementing AI in education, highlighting the potential of AI-based platforms to support educational processes through intelligent advisory and tutoring systems. Farahani emphasizes the necessity of developing teachers' competencies in managing technology to ensure its effective utilization.

The recent report „*Artificial Intelligence and Education: The Views of Teachers from Asia and Europe*” (2024) by Wayne Holmes and Kyungmee Lee explores the perspectives of educators from 47 Asian and European countries on the role of AI in secondary and vocational education, emphasizing its potential to enhance learning personalization, optimize administrative processes, and deliver practical vocational training through simulations. However, it also highlights significant challenges, including unequal technological access, ethical concerns like data privacy and algorithmic biases, and the critical need for comprehensive teacher training. The authors advocate for AI to act as a supportive tool and the need for educators to adopt a human centric and critical approach to the adoption of AI tool to support teaching and learning rather than serve as a replacement for educators, urging collaboration among policymakers, and developers to ensure the fair and ethical integration of AI in education.

Application and Research in Education

The practical implementation of AI in education has been explored in an international collaboration involving educators from Europe and Asia. During a project under the ASEF Classroom Network School Collaboration (November 2024), participants utilized AI to create customized model answers and personalized materials for exams, including language and chemistry tests. Existing tools such as Canvas and Eleven labs (including banners, posters, and logos) were used, in addition to AI to analyse professional exam

tests on business and advertising profiles for model exam answers. They offered scaffolding for student learning, demonstrating the interdisciplinary integration of AI in both academic and creative projects. Workshops such as *My Roots – My Future*¹ highlighted AI's role in contextual education, merging regional history studies with AI-based technological projects. Evaluations revealed that AI-enhanced materials increased student engagement, improved exam readiness, and allowed teachers to allocate time more effectively. Interviews with educators and surveys of students from Poland, New Zealand and Vietnam demonstrated heightened competence and enthusiasm for using AI technologies, validating their role as a supportive element in education.

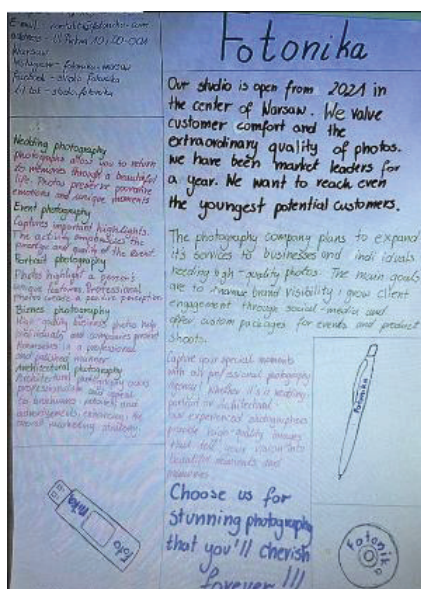
The study confirmed the hypothesis that AI-generated materials improve learning efficiency, bolster student performance, and enhance the personalization of education. AI also served as a valuable assistant for educators, streamlining workflows and enabling more dynamic teaching methods. As AI continues to evolve, its integration in education will likely redefine teaching and learning, highlighting the need for ethical frameworks and global cooperation to maximize benefits while mitigating risks.

Description of the study

The project “Generating Customized Model Answers as Revision Guides Using AI” is part of the international collaboration within the 17th ASEF Classroom Network School Collaboration. It involved five teachers from different countries: Benny Pan from New Zealand, Mark Benesio Carace from Vietnam, Monika Oledzka from Poland, Pengfei Jiang from China and Susana Tomas from New Zealand as the project mentor. The students, aged 16-18 and preparing for exams, worked on generating model answers to exam tasks with the support of artificial intelligence tools such as ChatGPT and other NLP (Natural Language Processing) tools. Approximately 30 students from each participating school took part in the study. However, students from China were excluded as participation was not permitted due to local regulations. The tasks covered a variety of topics, from test language exercises to tasks related to an advertising company, plus the creation of advertising materials, which were then analyzed by AI to generate sample answers. The students also participated in workshops related to the history of the region, with the aim of developing research skills and understanding the relationship between the past and modern technologies.

The analysis included the work of two students and key suggestions from AI.

¹ Project under the patronage of the Marshal of the Mazovian Voivodship in Poland, the University of Siedlce and the State Archive in Siedlce (Poland).



Current Grade: 6/12 marks (50%)

Mark Breakdown:

A01 (Advertising Fundamentals): 2/3

✓ Basic contact information and social media

✓ Simple service definition

X Lack of fundamental advertising terminology (branding, CTR, ATL)

A02 (Creating Advertising Messages): 1/3

✓ Simple quality service message

X No clear communication strategy

X Missing core big idea

A03 (Media and Advertising Forms): 2/3

✓ Basic social media channels listed

✓ Types of services defined

X Missing broader media strategy

A04 (Business Effectiveness): 1/3

X Lack of specific business objectives

X No effectiveness metrics

To achieve full marks (12/12), the presentation should include:

1. Advertising Fundamentals:

- Use of professional terminology (branding, USP)
- Clearly defined brand strategy
- Precisely defined target groups (B2B, B2C)
- Integration with marketing objectives

2. Advertising Message:

- Clear big idea
- Consistent benefits communication
- Rational and emotional arguments
- Persuasive elements
- Brand value proposition

3. Media Strategy:

- Detailed ATL and BTL media plan
- Integrated social media strategy
- Measurable communication goals (CTR, reach)
- Channel selection rationale

4. Business Aspects:

- Specific development goals
- Performance indicators (KPIs)
- International development plan
- Brand value building strategy
- ROI measurements

Recommended Improvements:

1. Strategic Elements:

- Add professional advertising terminology
- Develop comprehensive communication strategy
- Present specific business objectives
- Describe measurable success indicators

2. Tactical Elements:

- Expand marketing action plan
- Add international brand building elements
- Include competitive analysis
- Detail resource requirements

3. Implementation:

- Timeline for international expansion
- Budget allocation strategy
- Risk management plan
- Quality control measures

4. Measurement:

- Define success metrics
- Set up monitoring systems
- Establish feedback loops
- Create reporting structures

This would better demonstrate:

1. Comprehensive understanding of advertising principles
2. Strategic thinking capability
3. Practical implementation skills

Remember to:

- Use industry-standard terminology
- Provide specific examples
- Show clear cause-and-effect relationships
- Demonstrate strategic thinking
- Include practical implementation steps
- Address potential challenges
- Outline success metrics

The analysis examines evaluations of AI-prepared responses in the context of student learning and their impact on the educational process. Four key areas (AO1-AO4)² were discussed in detail in the compilation, allowing several conclusions to be drawn regarding the effectiveness and limitations of AI-generated responses in the context of developing students' skills.

Undoubtedly, AI's strengths can be identified in areas such as AO1 (Advertising Fundamentals) and AO3 (Media and Advertising Forms), where useful and specific information was provided in relation to the core curriculum and exam requirements. For example, students were able to successfully use information on basic social media channels or service definitions. Students also mentioned other AI tools that contributed to improved engagement and enhanced student outputs such as Canva. The tools also effectively provided clear messages and concise definitions to clarify concepts. AI offered a structured and organized approach to answers, which had a positive impact on the learning process, enabling students to acquire knowledge in a logical and orderly manner. Pointing out the basic elements of advertising or defining categories of service was a valuable teaching aid.

Analysis of the example further indicates that in order to achieve maximum points for the presentation, students need to include a number of detailed elements related to advertising basics, creation of advertising messages, media strategy and business aspects. In terms of advertising basics, it is important to use terminology such as branding or unique value proposition (USP), precisely define target groups (B2B and B2C)³, and integrate activities with marketing objectives. An effective advertising message should be based on a clear guiding idea, consistent communication of benefits, rational and

² In Cambridge exams, the assessment objectives (AO1-AO4) focus on different skills. AO1 assesses the ability to demonstrate knowledge and understanding of topics, facts, and concepts. AO2 measures the ability to apply knowledge to solve problems or analyze situations. AO3 focuses on analyzing information, arguments, and data, identifying relationships, and breaking down complex ideas. AO4 evaluates the ability to assess different perspectives, form reasoned judgments, and justify conclusions.

³ B2B (Business to Business) refers to transactions between businesses, while B2C (Business to Consumer) involves businesses selling directly to individual consumers.

emotional arguments, and elements of persuasion that build the brand's value proposition. The media strategy requires detailed planning, including ATL and BTL channels, integrated social media activities, and measurable communication goals such as CTRs and reach. Finally, business aspects should focus on clearly defined development goals, performance indicators (KPIs), brand value building and methods for measuring return on investment (ROI).

At the same time, AI's recommendations point to the need to further develop a strategic approach in planning advertising campaigns⁴. In this context, it is crucial to expand communication strategies, take into account specific business objectives and success indicators. Improvements in the area of tactics include the development of a detailed plan for marketing activities, the introduction of brand-building elements in the international market, and competitive analysis. In the area of implementation, it is advisable to focus on budget planning, risk management and the implementation of quality control mechanisms. Finally, in the area of performance measurement, it is important to introduce success metrics, progress monitoring systems and reporting structures.

The analysis also shows deficiencies in more complex aspects of teaching. For example, the AO2 (Creating Advertising Messages) area lacked a detailed communication strategy and a key creative idea ("big idea"), which is the foundation of an effective advertising message. In AO4 (Business Effectiveness), AI did not provide specific business goals or performance indicators, which limited its application in more advanced tasks. This is because AI mainly focuses on providing basic information, and its answers are not always deep enough to support the development of strategic thinking or business analysis skills.

Conclusions from the analysis of the students' work above confirm that the detailed guidance of a teaching assistant in the form of AI, as well as, the integration of AI tools such as Canvas and Eleven labs to supplement teaching and learning can significantly support the educational process, helping students not only to understand the principles of advertising, improve language skills, but also to develop strategic thinking competencies and the ability to implement advertising campaigns in practice. These guidelines, along with recommendations for improvement, provide students with comprehensive knowledge and tools to better prepare them for challenges in the real business environment. This approach emphasizes the development of analytical, strategic and operational skills, making the learning process more individualized, practical and adapted to the demands of today's market.

⁴ The students' work was analyzed using an AI model developed by Benny Pan, which was trained to assess business exams. Additionally, for the needs of the Polish school, the model was supplemented with knowledge and guidelines for the professional exam in advertising techniques in Poland.

AI-generated answers, while providing useful information in the context of basic knowledge, are deficient in meeting more advanced learning needs. In this context, AI works best as a learning support tool, offering concise and well-organized content that can help students prepare for exams or understand basic concepts.

However, in order to effectively support the development of more complex skills, such as critical thinking, strategic analysis or creative thinking, it is necessary to complement AI tools with teacher interaction and teaching materials that fill in the gaps in AI responses. Incorporating these elements can increase the effectiveness of using AI in education, making it a tool for both learning the basics and developing advanced competencies.

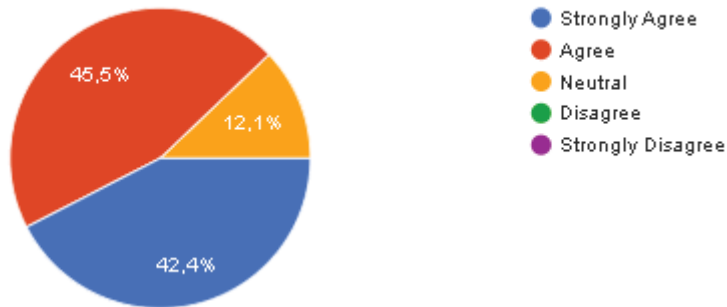
The results of the student survey and interviews with teachers showed that the use of artificial intelligence to generate model answers to exam questions had positive effects in terms of preparing students for exams. The users were satisfied with the AI assistant's explanations and showed higher scores in the retake tests, especially in tasks requiring analysis and synthesis of information. With the answers generated, students were able to better understand answer structures, learned how to formulate their answers to meet exam requirements, and how to solve more difficult questions.

An analysis of students' responses to a survey question about the most beneficial aspects of AI-generated model answers reveals the wide range of benefits these tools offer in the learning process. Respondents indicated that the clarity and structure of the answers, especially in the context of more challenging tasks such as exam questions, was one of the key advantages. AI provided logically arranged content that not only facilitated understanding of the issues, but also served as practical templates for future use. Moreover, many students highlighted AI's ability to explain topics in a detailed and accessible manner. What stood out was the educational style of responses, which differed from the technical approach of other tools such as ChatGPT. AI was able to adapt the way it presented information, avoiding complex language, making the material more understandable and engaging. It was trained using specific materials from the examination boards like marking schemes and syllabus/expected outcomes. The explanations helped students better understand difficult concepts and developed their ability to analyze independently.

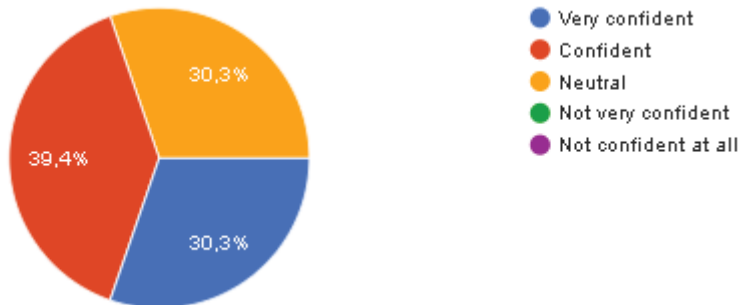
Respondents also appreciated the ability to personalize their responses. AI tailored the content to their level of proficiency, and offered additional exercises, which allowed for more comprehensive learning. In addition, the tools supported the development of analytical skills and practical application of knowledge, which was particularly useful in preparing for exams. Another important aspect was time saving. AI quickly provided accurate and comprehensive answers, which allowed students to focus on exploring knowledge

instead of wasting time searching for information. AI's ability to suggest different solutions and hints while working on tasks was an added advantage that increased the efficiency of the learning process.

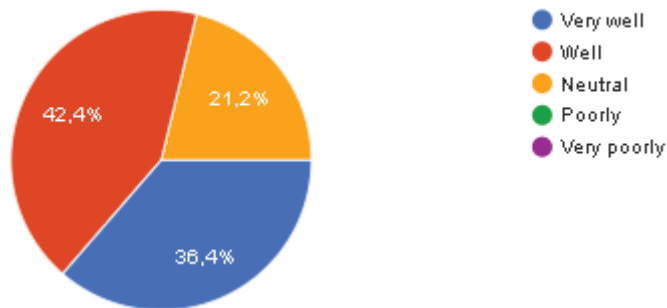
Did the AI-generated answers provide clear and accurate explanations relevant to the curriculum?



How confident were you in the reliability of the information provided by the AI-generated answers?



How well did the AI-generated answers support a collaborative and inquiry-based learning environment?



Teachers also observed improvements in student engagement. AI provided learning materials that were tailored to individual students' needs, which increased their motivation to learn. The study also showed that AI approaches in education can be particularly effective in language teaching, in the context of globalization and international educational standards. Students who used AI tools in this area showed higher skills in understanding texts and formulating answers to questions in a foreign language.

Students in the survey emphasized their greater effectiveness with AI support. They emphasized the clarity, conciseness and precision of its explanations, which facilitated understanding of the issues discussed and accelerated the learning process. The answers provided both ready-made solutions and detailed explanations of how the answers were arrived at, which enriched understanding of the mechanisms of thinking and reflection.

AI proved especially helpful in situations where students did not have access to a teacher, such as at home, where it also performed tasks for eager learners, showing relevant information by quickly answering detailed questions in an exam context. In addition, AI generated cues tailored to the level of learning, such as exam-style answer structures, which was particularly useful in preparing for A-level exams. The function of evaluating and providing constructive feedback on students' work was also highly rated, as it enabled students to improve their performance and develop analytical and critical thinking skills.

Another major advantage was the customization of answers according to the student's learning needs, including the creation of clear examples while referring to the core curriculum and identifying key areas for learning. AI supported students in developing appropriate essay structures and generated answer examples by section, such as AO1, AO2, AO3, which particularly helped to better understand exam requirements.

In summary, AI-generated model answers and descriptive assessments in accordance with exam specifications proved to be versatile tools to support the learning process. They facilitated effective learning, accelerated problem solving and supported a more individualized approach to education, developing students' analytical skills and increasing their confidence in preparing for exams.

The study's conclusions confirm that artificial intelligence can significantly improve the quality of learning and the efficiency of repetition, especially in the context of exams. AI tools have the potential to become an integral part of the modern educational process, offering personalization and support tailored to individual students' needs. Thus, AI not only complements traditional teaching methods, but also redefines the approach to the learning process in a more interactive and adaptive way.

The “Generating Model Answers as Revision Guides Using AI” project is a step toward the future of education, where artificial intelligence assists the learning process. Its use in generating model answers for exam questions could revolutionize the way students prepare for exams, as well as change the role of teachers by offering them new tools to teach more effectively and personalize educational processes.

AI in Education: Supporting Skill Development and Critical Thinking

Artificial Intelligence (AI) is transforming education by personalizing learning and enhancing critical thinking. By analyzing student data, AI systems identify learning gaps and adjust content to address individual needs. For example, a student struggling with geometry might receive customized exercises tailored to reinforce foundational concepts, ensuring steady progress. This adaptive approach allows students to develop problem-solving, reasoning, and collaboration skills.

AI also improves critical thinking by offering personalized feedback. It highlights logical flaws, suggests alternative strategies, and verifies factual accuracy in responses. For instance, a system might ask a student analyzing a text to identify core arguments and evaluate their validity, encouraging deeper analytical engagement. Additionally, AI-powered simulations immerse students in real-world scenarios, such as solving complex economic or social issues, fostering evaluative and predictive abilities. Initial studies show significant benefits, including improved academic performance and better-developed analytical skills. These tools also save teachers time by automating tasks like grading, enabling them to focus on guiding students through higher-level learning challenges. As AI continues to evolve, its role in creating skilled, critical thinkers will be pivotal, provided its implementation remains ethically aligned with educational goals.

AI has the potential to support the learning process, but its use should be complementary to other teaching methods to fully develop students’ skills. At the same time AI represents one of the most significant challenges and opportunities of the 21st century. As AI technologies evolve, it is crucial for global leaders and technologists to ensure that they are developed responsibly, with a focus on aligning these systems with human values and ensuring their positive impact on society.



Project authors and other participants of the 17th ASEF Classroom Network School Collaboration in Manila, Philippines, 2024

Authors contributions

The authors confirms being the sole contributor of this work.

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