

AI-assisted tools for learning

Gabriela KIRYAKOVA

Trakia University, Faculty of Education, Stara Zagora, Bulgaria

gabriela.kiryakova@trakia-uni.bg

Abstract: *Artificial intelligence is becoming an integral part of educational activities and processes. Artificial intelligence (AI) tools enable the creation of electronic resources in various formats with interactive elements, thereby facilitating teachers' work and accelerating the development process. Content generated with AI-assisted tools in multimodal formats can be integrated into learning environments and used to meet the diverse needs and preferences of learners with different learning styles and educational requisites, thereby ensuring personalized learning. The current paper aims to explore the capabilities of AI-assisted tools in digital educational content development.*

Keywords: Artificial intelligence, Education, AI-assisted tools, AI Chatbots.

1. Introduction

Artificial intelligence (AI) is revolutionizing education by transforming traditional teaching methods into personalized, adaptive, and learner-centered learning experiences (Strielkowski et al., 2025). AI can enhance learning platforms by adapting them to each learner's level of understanding, learning pace, and specific learning goals (Salhab, 2025).

AI can significantly enhance the way learners interact with educational content by offering personalized learning experiences (Ahn, 2024) that match their cognitive abilities and personal interests (Lechhab et al., 2024). Intelligent AI-based systems provide a customized learning path that adapts to students' individual learning needs and abilities (Oubalahcen & Tamym, 2023).

Based on the experience gained so far, several challenges and risks to the widespread adoption of AI in education are also reported. Among the most serious threats are those to academic integrity, excessive dependence on technology, which negatively affect the acquisition of knowledge and skills. An inability to guarantee the reliability of the generated content leads to the spread of misinformation and the learning of erroneous theories and concepts. Ethical concerns and risks associated with biased or inappropriate content (Baskara & Mukarto, 2023), including discriminatory elements (Farrokhnia et al., 2023), also arise. Finding a balance is essential to ensure that technology is used to enhance, rather than replace, human teaching and learning (Firat, 2023).

The ideas for adaptive and intelligent systems that will mark the beginning of AI-driven learning are promising, but they are not yet widely available to

learners and teachers. Currently, many teachers use the generative capabilities of AI tools to create content for teaching and learning, as well as for assessment.

This paper examines the potential of AI-assisted tools for developing digital educational content across various formats. AI-assisted tools for developing digital learning content are presented, highlighting their capabilities and addressing their shortcomings.

2. AI in education

AI is gradually becoming a key driver of change in education. AI technologies can alter teaching styles and the presentation of educational resources to students (Adăscăliței, 2025). They can help make personalized, targeted learning a reality.

The most notable impact of AI on education in a digital environment is the implementation of personalized and adaptive learning and assessment (Halkiopoulos & Gkintoni, 2024) and the integration of intelligent learning systems.

Adaptive learning technologies using AI modify content, pace, and teaching methods to match learners' preferences, strengths, and weaknesses (Strielkowski et al., 2025), based on their performance and progress (Firat, 2023). This approach ensures that they receive personalized support and feel motivated and engaged as they observe tangible progress (Strielkowski et al., 2025).

By continuously analyzing data, assessment results, interaction patterns, and tracking progress, adaptive learning systems can provide timely and targeted interventions in real time, ensuring that learners receive the most relevant materials and activities (Gligorea et al., 2023). Personalized instruction and feedback tailored to learners' needs and styles ensure that everyone receives tasks with an appropriate level of challenge (Lechhab et al., 2024), which improves learner engagement, interest, and motivation (Millalén, 2024) and promotes deeper understanding and higher levels of retention (Dritsas & Trigka, 2025).

From the teachers' perspective, the significant benefits of using AI tools in teaching include developing digital content that meets learners' needs, creating multimodal and multilingual content, assessing exams, and providing personalized help and feedback.

Creating digital content that meets learners' needs. Teachers can create additional resources on a given topic at varying difficulty levels using AI-assisted tools. AI-generated materials can be used for learners who require additional training due to difficulties or gaps, or for those who quickly master the material. Appropriate content will be provided to learners to engage and motivate them, tailored to their level of knowledge and designed to maintain their interest and participation in learning.

Creating multimodal and multilingual content. The diversity of learning content in its presentation formats is essential to effective acquisition. Developing learning resources in multimodal formats that cater to the diverse needs of students takes significant time and effort. AI-assisted tools can quickly generate images,

audio, and video from text prompts, as well as multilingual content, which offers an opportunity to expand the learner audience (Cote, 2025).

Exam assessment. AI can assist in creating and grading learners' assignments and quizzes. Learning management systems allow automatic grading of closed questions in quizzes. AI applications diversify assessment methods, provide immediate, personalized feedback, including on open-ended questions (Dritsas & Trigka, 2025), speed up and facilitate assessment activities, enabling in-depth analysis of results (Huang, Saleh & Liu, 2021), and provide more objective evaluation, thereby reducing the possibility of bias and error (Firat, 2023). Built-in AI algorithms can dynamically adjust the level of difficulty and content of assessment resources based on learners' performance, generating immediate feedback (Strielkowski, et al. 2025).

Personalized help and feedback. Real-time feedback, generated by AI tools, enables learners to understand their progress and identify areas for improvement immediately. A continuous learning and improvement cycle maintain learners' engagement and motivation (Lechhab et al., 2024; Millalén, 2024) and helps them understand their mistakes, make corrections, and solidify their knowledge (Gligorea et al., 2023).

Studies demonstrate high levels of student satisfaction with generative models such as ChatGPT, and describe them as more convenient and accessible than traditional tutoring or email communication with instructors (Tanjga, 2023).

Collaboration between educators and AI is inevitable and requires digital competence in AI and the ethical use of its capabilities (Bicen, 2025). Such a partnership empowers teachers to use AI thoughtfully, ensuring that technology enhances learning rather than replacing them.

3. AI-assisted tools for education

3.1 Generative AI tools

Generative AI tools (also known as AI chatbots), such as Google Gemini, Microsoft CoPilot, ChatGPT, and others, create new content based on learning models. They act as personal assistants, offer immediate feedback, answer queries, and even suggest additional resources based on the student's learning trajectory (Jian, 2023).

The creation of learning materials (presentations, lesson plans, questions or assignments) is accompanied by conversations with AI chatbots. Discussions include suggestions on the learning content and its formats, the pedagogical approaches to be implemented, targeted feedback for learners, activities to engage and motivate them, questions or assignments to assess mastery of the learning content, and ideas for gamification. The discussions generate ideas and suggestions that teachers can further develop and include in their classes.

As an example of developing educational materials with AI chatbots (Copilot and Gemini), educational content on Color Models in Computer Graphics was generated. The two AI chatbots created a lecture outline, with the content

structured and formatted for presentation slides (Figure 1). It is also possible to generate presentations that teachers can edit and adapt.

4.1 RGB Color Model

- **Type:** Additive
- **Primary Colors:** Red, Green, Blue
- **Used In:** Screens, cameras, digital imaging
- **Color Space:** Represented by the **RGB Color Cube**
 - Each axis represents one primary color.
 - Colors are created by adding light.

Visual Aid: 3D RGB Color Cube.

Visual Aids

1. RGB Color Cube

A 3D representation of the additive RGB color space.

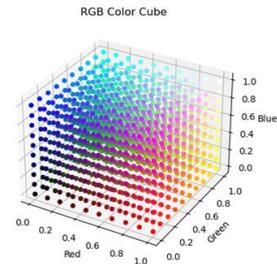


Figure 1. Content generated with Copilot

In addition, AI chatbots generated images, questions on the topic, and suggestions for targeted feedback, as well as practical tasks with formulated assessment criteria and so-called Creative Tasks (Figure 2).

Download the assignments:

[ColorModelsAssignments.pdf](#)

It includes:

- **Theoretical Questions**
- **Practical Exercises**
- **Creative Tasks**

Download the answer guidelines:

[ColorModelsAssignmentsAnswerGuidelines.pdf](#)

It includes:

- Suggested answers for theoretical and practical questions
- Evaluation criteria for creative tasks
- Grading rubrics for all assignment types

Figure 2. Additional materials generated by Copilot

A disadvantage of AI chatbots is that the learning materials are presented as outlines, requiring teachers to create detailed content.

3.2 Content management systems

Content management systems provide tools for creating interactive content that seamlessly integrates various elements. A popular tool for creating interactive content, such as e-books, is Kotobee Author. Teachers can include videos, audio, interactive images, slideshows, questions, and 3D models to make content interactive, engaging and motivating. The e-book can be integrated as a SCORM package into different learning management systems. Kotobee Author is enriched with AI-based tools that generate text, images and quiz questions.

The generated paragraphs (maximum size of up to 3) are based on a text description of the desired content (as an example – The essence of Color Models in Computer Graphics – definition, purpose) – Figure 3.

In the realm of digital imaging, color models play a crucial role in defining and representing colors. A color model is essentially a mathematical model describing the way colors can be represented as tuples of numbers, typically as a combination of primary colors. Each color model serves a specific purpose, whether it's for displaying images on a screen, printing them on paper, or storing them digitally.

The essence of color models lies in their ability to accurately define colors and communicate them consistently across different devices and mediums. By using a color model, designers and developers can ensure that the colors they choose will appear as intended, regardless of the platform. Understanding the intricacies of color models is essential for anyone working with digital imagery, as it forms the foundation for color management and reproduction.

Ultimately, the purpose of color models is to provide a standardized way of representing colors, allowing for seamless communication and reproduction of colors in various applications. Whether it's the RGB model for digital displays, the CMYK model for printing, or the HSL model for color selection, each color model serves a unique function in the world of digital imaging. Mastering the essence of color models is key to achieving accurate and consistent color representation in any creative endeavor.

Figure 3. Text generated with AI Content in Kotobee Author

The platform allows the creation of questions for both user-generated and AI-generated content (Figure 4).

Color models
Fri, 13 Jun 2025 18:52:31 GMT

Which of the following color models is primarily used for digital displays due to its additive color mixing properties?

CMYK (Cyan, Magenta, Yellow, Key/Black)

RGB (Red, Green, Blue)

HSV (Hue, Saturation, Value)

Pantone Matching System (PMS)

[Add to chapter](#)

Figure 4. Questions generated with AI Content in Kotobee Author

There are options for generating images from text prompts, but their quality is not at the required level and they cannot be directly integrated into the e-book.

A disadvantage of these tools is that content generation does not involve discussion, clarification, or the offering of advice or recommendations. There are opportunities to edit the content before integrating it into the e-book.

3.3 AI content generation tools

There are online platforms and AI-based tools available on the Internet that generate images and sounds from text prompts, which can be incorporated into learning content.

Image Generation. Tools for generating images from text prompts are among the most popular AI tools available online. Popular examples of such tools are Firefly and Pixlr.

The results of generating images from a text prompt “Please, generate RGB Color Cube, which represents the RGB Color Model” are shown in Figures 5 and 6. Both tools offered several images, each with additional effects applied.

The presence of artistic effects is a disadvantage when the generated images are intended to illustrate learning content, as it diverts attention from the essence of the object, phenomenon, or process. In the example (3D Color Cubes), the generated images include additional effects (light and shadow, glare, reflections) and therefore could not be integrated into the learning content.



Figure 5. Image generated with Firefly

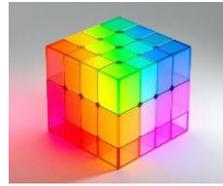


Figure 6. Image generated with Pixlr

Audio Generation. Existing learning materials (texts or presentations) can be voiced using AI tools. A good example is AI Voice in Canva, which can create computer-generated voices that imitate human speech. Teachers can use their notes on the presentation slides to generate a voice. The presentation, along with the generated audio, can be saved as a video file, creating multimodal educational content that is more engaging for learners.

3.4. Educational platforms integrating AI

There are online educational tools and platforms for generating quiz questions of various types. Through them, teachers can create questions or utilize the available AI-assisted options. Popular examples of such tools are Socrative, Kahoot!, and Gradescope.

The use of Socrative demonstrates that by specifying the topic and key points, teachers can use the AI-assisted options to create quiz questions with correct answers and generated explanations (Figure 7). The questions can be edited, but there is no opportunity for additional clarification, suggestions, or discussion.

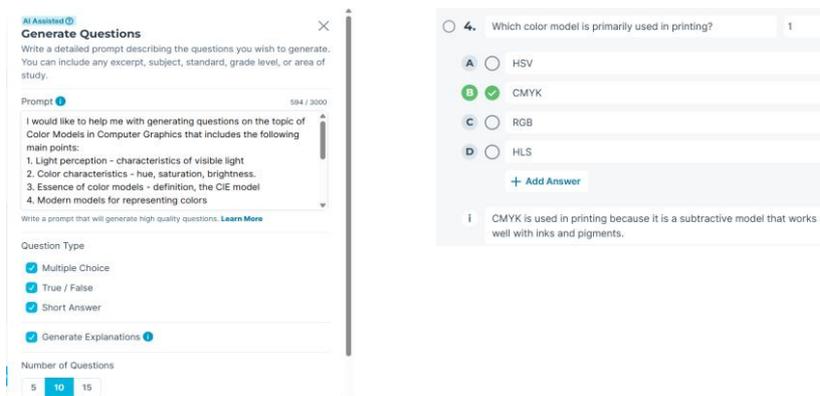


Figure 7. Questions generated with Socrative's AI-Assisted options

There are generative AI educational platforms that integrate multiple tools to create a wide range of learning resources and activities. Magic School AI is a set of tools designed to assist teachers in developing lesson plans, generating learning materials, and creating practical tasks, questions, and images from text, saving time and effort. The platform enables discussions with a chatbot that provides additional suggestions and guidance on content generation.

The presented tools enable the creation of various resources that can be integrated into the overall presentation of learning content. Working with them is time-consuming because many additional instructions are required to ensure that the generated content aligns with the teacher's overall ideas for presenting the learning units.

4. Conclusions

AI-based tools enable the generation of learning content in multimodal formats, including text documents, presentations, images, audio, video, quiz questions, and practical tasks. Thereby, they facilitate and accelerate the development of educational materials and the implementation of educational activities. The role of teachers is essential – they set prompts, correct and refine the generated content with additional requests, and organize and integrate materials into digital learning systems. The presented AI-assisted tools demonstrate strong capabilities, but working with them requires time and effort to produce AI-generated content in an appropriate format tailored to learners' preferences and educational goals.

The need for integrated intelligent systems is obvious. They will facilitate the transition from AI-assisted educational tools to AI-driven education by adapting and personalizing instruction to learners' strengths and weaknesses and their specific educational needs.

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