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Artificial Intelligence as a Learning Assistant: Design and Evaluation of the Asking Ai+ Platform for Graphic Engineering Education

ABSTRACT

The increasing use of artificial intelligence (AI) in graphic engineering, design and desktop publishing has created a need for educational environments that combine structured instructional materials with on-demand learner support. This paper presents the second development phase of the ASKING educational platform, referred to as ASKING AI+, in which a dedicated AI chatbot is integrated into the existing multimedia learning environment. The original ASKING platform provides practical lessons for Adobe, Affinity and Microsoft Office applications in text-and-image, video and AI-avatar formats. These instructional modalities have already been examined in two controlled student studies, providing an empirical basis for further platform development. The new ASKING Assistant is configured to answer domain-specific questions, explain practical procedures step by step, support troubleshooting and design decisions, and generate formative quizzes on request. The assistant prioritizes the platform knowledge base and is accessible from the platform homepage and from the end of each lesson, allowing learners to request help at the point of need. The paper describes the development rationale, chatbot configuration, website integration and the relationship between the new conversational layer and findings from the previous evaluations. A dedicated student evaluation of the chatbot-enhanced platform is planned as the next research stage, with particular emphasis on perceived additional learning support, usefulness of question answering and quizzes, clarity, learner control and objective learning outcomes.

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KEY WORDS
Artificial intelligence, educational platform, AI chatbot, graphic engineering education, Desktop Publishing, formative assessment, multimedia learning

1. Introduction

Digital transformation has changed both professional workflows and the competencies expected from students in graphic engineering and design. Contemporary graphic technology education extends beyond traditional printing processes and increasingly includes cross-media production, software-intensive workflows, data processing and AI-supported design activities. Consequently, educational programmes need to combine disciplinary knowledge with practical digital skills and flexible learning resources that students can use while solving authentic tasks (Liang, Wang & Wang, 2024; Taneja, 2025). Experience from graphic engineering students also shows that digital environments can provide flexibility, but sustained attention, motivation and meaningful interaction remain important conditions for effective online learning (Tomić et al., 2022).

Generative AI and large language models have introduced a new form of educational interaction. In addition to generating content, conversational systems can

answer learner questions, provide explanations, support problem solving and act as virtual tutors. Reviews of ChatGPT and related large language models identify considerable potential for personalized guidance and immediate feedback, while also emphasizing risks associated with inaccurate information, overreliance, academic integrity and the need for human verification (Kasneci et al., 2023; Lo, 2023). More recent research on educational chatbots indicates that conversational support can contribute to self-regulated learning by helping learners identify resources, select strategies and monitor their progress, although the effects are not uniformly positive across all contexts (Guan et al., 2025).

The introduction of more advanced technology does not, however, guarantee superior learning. The Cognitive Theory of Multimedia Learning emphasizes limited processing capacity, active processing and the importance of instructional design in coordinating verbal and visual information (Mayer, 2024). Similarly, empirical studies of video tutorials indicate that learning effects depend on design, task characteristics and cognitive load rather than on the medium alone (Fan, Bower & Siemon, 2024). This consideration is especially relevant in software learning, where novices need to follow procedures, locate interface elements and immediately apply a sequence of operations in a real working environment.

The ASKING platform was developed in this context as a practical educational environment for learning DTP-related software and the application of AI in contemporary graphic workflows. Its first phase focused on the creation of structured lessons in several presentation modalities. Following the initial development, two student experiments evaluated the underlying instructional formats in Microsoft Excel and Adobe Illustrator (Kašiković et al., 2026a; Zeljković et al., 2026). The results did not support a simple assumption that a more technologically sophisticated format is automatically more effective. Instead, they emphasized structure, pacing, signaling and learner control. These findings directly motivated the second development phase: rather than replacing existing materials, ASKING AI+ adds an optional conversational assistant that learners can activate when they need clarification, troubleshooting or a knowledge check.

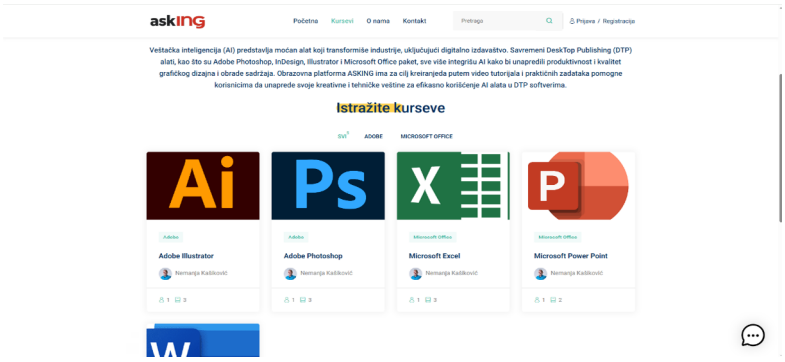
The aim of this paper is therefore to present the design and integration of the ASKING AI+ conversational learning layer, relate its design to the evidence obtained in previous ASKING evaluations, and define a research framework for its dedicated student evaluation. The contribution is not a claim that the new chatbot has already improved learning outcomes. Rather, the paper documents an evidence-informed transition from multimodal content delivery toward learner-initiated, context-sensitive AI support within a specialized graphic engineering education platform.

2. Development and previous evaluation of asking

2.1. Original platform and multimodal lesson structure

The original ASKING platform was designed around practical, modular lessons for nine software applications used in graphic preparation, design and office workflows: Adobe Photoshop, Illustrator and InDesign; Affinity Photo, Designer and Publisher; and Microsoft Word, Excel and PowerPoint. The first development phase organized lesson content in three complementary formats: (1) step-by-step text-and-image instructions, (2) screen-recorded video tutorials with narration, and (3) AI-avatar video tutorials created using Studio D-ID. The intention was to allow the same procedural content to be approached through different media while retaining a practical orientation toward task completion (Kašiković et al., 2025).

Figure 1 presents the course overview from the first phase of the ASKING platform. The interface was developed to make individual software courses directly accessible and to support repeated use of lesson materials outside a conventional classroom setting.



» **Figure 1:** *ASKING platform course overview developed in Phase 1*

Table 1
Previous evaluations of ASKING instructional modalities

Study	Learning task	Conditions and sample	Main result	Design implication for ASKING AI+
Kašiković et al. (2026)	Microsoft Excel procedural functions	Static text-and-image; human-narrated video; AI-avatar video; N = 65	No statistically significant differences in knowledge acquisition, practical task performance or seven-day retention. Some participants perceived the avatar as distracting.	Technological complexity alone should not drive the platform. Keep support optional and focused on the learner's immediate need.
Zeljković et al. (2026)	Introductory Adobe Illustrator / business-card task	Text-and-image instruction; AI-avatar video; N = 81	Text-and-image material produced higher immediate knowledge scores; no significant group differences in practical performance or delayed-test scores.	Preserve learner control, pacing and clear visual/procedural structure; use AI as support rather than compulsory delivery.

2.2. Evidence from student evaluations

The first-stage instructional materials were subsequently evaluated in two controlled studies. The studies addressed different software environments and different comparisons, but together they provide a useful empirical basis for the next platform iteration. Their main characteristics and design implications are summarized in Table 1.

In the Excel study, 65 participants were analyzed across three conditions: static materials, video with human narration and video with an AI-generated avatar. No statistically significant differences were detected in immediate learning, practical performance or retention, and the qualitative responses suggested that the AI avatar was useful for some learners but visually distracting for others (Kašiković et al., 2026a). In the Adobe Illustrator study, 81 first-year students were randomly assigned to text-and-image or AI-avatar video instruction. The text-and-image group performed better on the immediate post-test, whereas practical-task and delayed-retention outcomes did not differ significantly between groups (Zeljković et al., 2026).

These results are important for the design of ASKING AI+ because they shift the development question from "Which medium is the most advanced?" to "When and how should technology support the learner?" The new phase therefore retains the existing lesson formats and adds a learner-controlled assistant that can be called only when needed. This approach is consistent with multimedia-learning principles and with evidence that learner control and well-structured content can be more important than the mere presence of visually rich or AI-generated elements (Mayer, 2024; AlShaikh, Al-Malki & Almasre, 2024).

3. Design and integration of the asking ai+ assistant

3.1. Design requirements and pedagogical role

The ASKING Assistant was configured as a specialized educational chatbot rather than as a general-purpose conversational system. Its primary role is to support practical learning in the same nine software applications covered by the ASKING platform and to connect explanations with the workflows, terminology and tasks used in the educational materials. The assistant is intended to complement, not replace, the written and video lessons.

The main design requirements were defined as follows:

- provide clear, professional and immediately applicable explanations for Adobe, Affinity and Microsoft Office workflows;
- explain the logic and order of a procedure rather than giving only a final answer;
- prioritize the materials uploaded to the ASKING knowledge base before using general knowledge;
- support troubleshooting by identifying likely causes and proposing solutions from simpler to more complex;
- support design and prepress decisions related to composition, typography, readability, color, document dimensions, resolution, bleed, fonts and PDF export;
- generate formative quizzes and mini-checks when the learner requests them; and
- state uncertainty instead of inventing software commands, and use current web information only when version-dependent or time-sensitive information is required.

These constraints are important in software education because a plausible but incorrect menu name, command or sequence can immediately prevent task completion. The configuration therefore explicitly instructs the assistant not to invent tools or interface options and to distinguish stable domain knowledge from information that may change between software versions. This design also reflects the broader recommendation that educational use of large language models requires critical verification and explicit attention to system limitations (Kasneci et al., 2023; Lo, 2023).

3.2. Knowledge-grounded question answering and practical support

The assistant uses the uploaded ASKING learning materials as its first source of domain context. If the required answer is not covered by the knowledge base, it may rely on general knowledge, while web search is reserved for information that can change over time, such as software versions, new AI functions, licensing conditions or current capabilities. In practical questions, the preferred response structure contains the software name, the user's goal, ordered steps, relevant notes and a short self-check. This organization is intended to make the answer directly transferable to work in the target application.

The conversational layer also broadens the function of the platform beyond fixed lesson sequences. A learner can request clarification of a term, ask why a particular step is necessary, compare two software tools, obtain feedback on a workflow, describe an error or ask how an AI function can be incorporated into a DTP process. When an error cannot be diagnosed from the description alone, the assistant is instructed to ask for the software version, intended action and observed outcome, and may suggest that a screenshot be provided. This creates a form of just-in-time learning support that was not available in the first platform phase.

3.3. Formative quizzes and knowledge checks

An additional function is on-demand quiz generation. The chatbot can create a knowledge check for a selected program, topic and level (beginner, intermediate or advanced). If the learner does not define the topic or difficulty, the assistant requests the missing information. Questions can be multiple choice, true/false, short answer, practical scenarios or questions concerning the correct order of procedural steps. The default interaction presents one question at a time, waits for the learner's answer, provides immediate corrective feedback and explanation, and displays a final score with a recommendation on what should be reviewed.

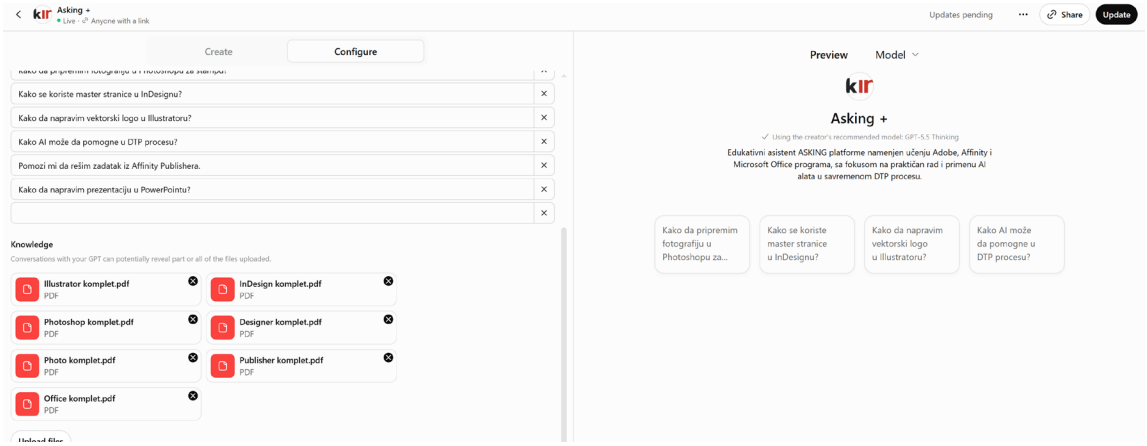
This function is deliberately described as formative and learner-initiated rather than as a fully adaptive assessment engine. The current implementation can tailor the topic and difficulty and can respond to the learner's answers, but it does not yet implement a validated algorithm that automatically models long-term learner performance or dynamically changes the curriculum. Such analytics-based adaptation remains a possible later development. This distinction is important because the pedagogical value of a chatbot should be evaluated on implemented functions rather than on assumed capabilities.

3.4. Website integration and two-phase platform structure

The chatbot was integrated into the ASKING learning workflow at several access points. A direct link to the ASKING GPT Bot was added to the platform homepage. The same access button was also placed at the end of each lesson, enabling students to move from a completed lesson directly to questions, clarification or a quiz without searching for a separate support service. The platform-side integration was configured to connect the educational website with the dedicated

Table 2
ASKING AI+ integration points and intended educational functions

Integration point	Implemented function	Educational purpose
Platform homepage	Direct link to the ASKING Assistant	Make AI support visible and available independently of a specific lesson.
End of each lesson	Repeated access button to the same assistant	Enable immediate questions, troubleshooting or self-check after learning content.
ASKING GPT configuration	Knowledge base, domain instructions, practical response rules and quiz behavior	Keep responses aligned with platform content and DTP learning goals
"About us" page	Project divided into Phase 1 and Phase 2	Make the development trajectory and the new AI-supported layer transparent to users.



» **Figure 2:** *ASKING Assistant configuration with domain knowledge resources and conversation starters*

ASKING GPT Bot, while the “About us” page was reorganized to present the project as two development phases: Phase 1, focused on multimodal lesson creation and validation, and Phase 2, focused on conversational AI support and formative knowledge checking. The public assistant can be accessed at: https://chatgpt.com/g/g-6a43cd1b6c48819198c96ca3e92b9169-asking.

Figure 2 illustrates the configuration environment of the ASKING Assistant, including the uploaded domain knowledge resources and predefined conversation starters. The configuration demonstrates that the chatbot is organized around the same software families as the platform rather than around unrestricted general conversation.

4. Implemented functionality and design rationale

The main development result of Phase 2 is an operational conversational support layer added to a platform whose instructional materials have already undergone empirical evaluation. The relationship between the two phases is therefore cumulative: Phase 1 provides the learning content and evidence concerning presentation modalities, while Phase 2 introduces an interaction mechanism through which the learner can request additional explanation, diagnosis or assessment at a self-selected moment.

This distinction is pedagogically relevant. The AI-avatar videos used in the earlier experiments were pre-authored instructional presentations: the avatar delivered a fixed narration and did not answer questions or adapt its explanation during the experiment. By contrast, ASKING AI+ is learner initiated. A student who understands a lesson does not need to interact with the chatbot, while a student who encounters a problem can request a shorter explanation, a sequence of steps, a comparison, an example or a quiz. Thus, the chatbot is designed to add control rather than another compulsory stream of information. This responds directly to the previous finding that pacing, clear visual signaling and learner control matter in introductory software learning (Zeljković et al., 2026).

The quiz function introduces a second change: the platform can now move from content presentation to immediate formative interaction. Educational chatbots have been associated with support for self-regulated learning processes, particularly resource identification, strategy enactment and monitoring of understanding (Guan et al., 2025). In ASKING AI+, a quiz can be requested immediately after a lesson and can therefore serve as a lightweight self-check before the learner moves to the next task. The assistant’s feedback is intended to explain why an answer is correct or incorrect rather than simply report a score.

The knowledge-priority rule also addresses a central limitation of generative AI in education. General-purpose language models can produce fluent answers that are incorrect or poorly matched to a specific course. By prioritizing uploaded ASKING materials and by instructing the assistant not to invent software commands, the design attempts to narrow the response space and maintain alignment with the course. This does not eliminate the need for verification, particularly for version-dependent software information, but it provides a clearer instructional boundary than unrestricted chatbot use.

The approach is also consistent with current directions in graphic design education. Project-based and authentic learning approaches emphasize practical application and structured guidance (Taneja, 2025), while graphic technology education increasingly requires competence across conventional production, digital media and AI-supported workflows (Liang, Wang & Wang, 2024). AI tools in graphic design can be valuable as supportive media without necessarily outperforming

conventional methods in every task (Ardhianto & Aquirel, 2026). In this sense, ASKING AI+ treats AI as an additional learning instrument rather than as a substitute for software knowledge or instructor expertise.

5. Proposed student evaluation of the chatbot-enhanced platform

The next research stage will evaluate the chatbot itself. This is necessary because the two completed studies examined the instructional modalities of the original platform, not the effect of real-time conversational assistance. The primary future research question is whether students perceive that the ASKING Assistant provides additional help beyond the existing lesson materials, especially because it can answer questions at the point of difficulty and generate quizzes on request.

The planned evaluation will focus on the following research questions:

- RQ1: Do students perceive the chatbot as providing additional support for understanding and completing ASKING lessons?
- RQ2: How useful, clear and actionable are the chatbot's answers to software and DTP-related questions?
- RQ3: Do students consider the on-demand quiz function useful for checking knowledge and identifying topics that require revision?
- RQ4: Does chatbot access affect learner confidence, perceived control, engagement and the need to search for external explanations?
- RQ5: In a controlled extension of the study, do subjective benefits correspond to measurable differences in immediate knowledge, practical performance or retention?

A first evaluation stage can use a post-use questionnaire after students complete a defined set of ASKING lessons with chatbot access. A five-point Likert scale would allow direct comparison with the subjective dimensions already used in previous ASKING research, while open-ended questions would capture examples of useful answers, unclear responses, unsuccessful interactions and suggestions for improvement. The questionnaire should specifically separate the usefulness of question answering from the usefulness of quizzes, because these functions support different learning processes.

A second, controlled stage can compare students using the standard ASKING lesson environment with students using the same lessons plus ASKING AI+. To maintain comparability with the previous studies, the experiment can include a pre-test, immediate post-test, practical task and delayed retention test. If interaction logs are technically available and collected with appropriate consent, they may be used only as supplementary evidence to examine the types of questions students ask and the frequency of quiz use. The central criterion should remain learning value rather than interaction volume.

The planned evaluation is particularly important because positive perception does not automatically

Table 3
Proposed dimensions for the ASKING AI+ student evaluation

Evaluation dimension	Example indicator	Proposed measure
Additional learning support	The chatbot helped me understand content that was unclear in the lesson.	Likert 1–5 + comment
Answer usefulness	The answers were relevant and could be applied directly in the software.	Likert 1–5
Clarity and procedure	The step-by-step explanations were easy to follow.	Likert 1–5
Quiz usefulness	The quiz helped me identify what I understood and what I should review.	Likert 1–5 + quiz usage
Learner control	I could obtain the amount and type of explanation I needed.	Likert 1–5
Trust and verification	I knew when an answer should be checked against the lesson or software version.	Likert 1–5 + comment
Learning outcomes (extended study)	Knowledge acquisition, practical application and retention.	Pre/post test, practical task, delayed test

imply improved performance. Both completed ASKING studies demonstrated that engagement with a technologically novel format and objective learning outcomes can diverge (Kašiković et al., 2026a; Zeljković et al., 2026). The future chatbot study should therefore report subjective evaluations clearly and, where possible, connect them with objective measures instead of treating satisfaction as evidence of effectiveness.

6. Discussion

ASKING AI+ represents a change in the role assigned to AI within the platform. In the first phase, AI was primarily used to produce instructional presentation through a generated avatar. In the second phase, AI becomes an interactive learning assistant. This change is not merely technical: it changes the timing and direction of interaction. The learner decides when support is needed, formulates the question and can request another explanation or a quiz. Such interaction has the potential to support self-regulation and reduce the gap between encountering a problem and receiving guidance, which is a central advantage of conversational systems in education (Guan et al., 2025).

At the same time, the previous ASKING findings argue against assuming that AI interaction will necessarily improve achievement. The Administrative Sciences study found equivalent objective outcomes across static, human-video and AI-avatar modalities, while the Applied Sciences study found an immediate-learning advantage for structured text-and-image material without a corresponding advantage in practical performance or retention (Kašiković et al., 2026a; Zeljković et al., 2026). The appropriate interpretation is therefore not that AI should be removed, but that it should be used where it provides a distinct pedagogical function. In ASKING AI+, that function is on-demand explanation, troubleshooting and formative dialogue.

This principle is consistent with the wider literature. Multimedia learning theory emphasizes the management of limited cognitive resources and the purposeful organization of words and visuals (Mayer, 2024). AI-assisted multimedia systems can be effective when their features are linked to clear instructional functions rather than added as decorative technological complexity (AlShaikh, Al-Malki & Almasre, 2024). Likewise, recent work in graphic design shows that AI tools can provide useful alternatives and references while not consistently producing superior results to conventional approaches (Ardhianto & Aquirel, 2026).

The specialized scope of ASKING AI+ is another important aspect. Generic AI tools can provide broad assistance, but the platform is intended for procedural learning in a defined domain. Graphic engineering education requires attention not only to software commands but also to design quality, prepress preparation, color, typography, file formats and production requirements. A domain-oriented assistant can connect these concepts with specific software tasks. Similar multimedia-supported approaches have also been proposed for process-oriented areas such as textile screen printing, suggesting that the underlying method could be extended to other technical subjects in graphic and textile engineering (Kašiković et al., 2026b).

The current development nevertheless has limitations. First, the dedicated chatbot has not yet been evaluated with students, so its effectiveness remains an empirical question. Second, responses generated by a large language model can vary, and the knowledge base must be maintained as software and platform content evolve. Third, access through a third-party conversational AI environment introduces dependency on changes in that service. Finally, academic integrity, copyright, privacy and the verification of generated information must remain explicit parts of student guidance. These limitations are not reasons to avoid the technology, but they define the conditions under which the next evaluation should be conducted.

7. Conclusions

This paper presented the second development phase of the ASKING educational platform for graphic engineering, design and DTP education. The original platform combined step-by-step written materials, conventional video tutorials and AI-avatar video lessons across Adobe, Affinity and Microsoft Office applications. Two subsequent student studies provided evidence that more technologically complex presentation formats do not automatically produce better learning outcomes and highlighted the importance of structure, pacing and learner control.

ASKING AI+ builds on that evidence by adding a dedicated conversational assistant instead of replacing the established lesson formats. The assistant is configured to prioritize ASKING knowledge materials, provide practical step-by-step explanations, support troubleshooting and design/prepress decisions, and generate formative quizzes on request. Access is integrated through the platform homepage and the end of individual lessons, while the project presentation has been reorganized into Phase 1 and Phase 2 to make the development path explicit.

The next stage is empirical evaluation of the chatbot-enhanced environment. Students will assess whether the assistant provides additional help in learning, whether its answers are useful and actionable, and whether the quiz function contributes to knowledge checking and revision. A subsequent controlled comparison can determine whether these perceived benefits are accompanied by measurable changes in knowledge

acquisition, practical task performance or retention. In this way, ASKING can continue to develop as an evidence-based educational environment in which AI is introduced according to demonstrated learning needs rather than technological novelty alone.

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