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GENERATIVE ARTIFICIAL INTELLIGENCE AND PROJECT BASED LEARNING: INNOVATIVE LEARNING TECHNOLOGIES IN HIGHER EDUCATION SYSTEMS AND THEIR APPLICATIONS IN ART AND DESIGN

The integration of generative artificial intelligence and project-based learning into the higher education system represents one of the most advanced, pioneering, and practical learning approaches today. It breaks away from the traditional teacher-centered instructional model. Within this learning paradigm of human-AI coexistence and inquiry, it enhances students' capacity for independent exploration, shifting the focus from knowledge transmission to competency cultivation, thereby injecting new vitality into teaching with its distinctive characteristics [1]. Furthermore, applying this advanced teaching model to majors that emphasize originality and hands-on practice, such as art and design, yields even more significant results.

Theoretically, generative AI introduces a new core to project-based learning. The traditional PBL model emphasizes authentic problems, major tasks, interdisciplinary learning, and the development of guided problem-solving and collaboration skills. With the addition of «AI-enhanced project-based learning», AI's role transforms from a mere tool for solving problems or assisting creation into a super source of inspiration, an infinite sketchbook, and an on-demand critic. During the creative process, it generates a vast amount of material and data, enabling rapid iteration of project content. Indeed, the newly generated content adds a new dimension to the project itself. This process forms a dynamic, iterative cycle of continuous feedback and revision [2]. It fully aligns with constructivist learning theory, as students continuously interact with AI, constantly constructing and refining their own knowledge, their understanding and application of that knowledge, and gradually enhancing and perfecting their own «formative abilities».

For the art and design major, this learning approach transforms the conventional teaching method. From the initial stage of a project, students can use generative AI tools like Midjourney and Stable Diffusion to quickly produce visual style drafts and conceptual sketches based on their own textual prompts, which exceed their inherent imagination, thereby rapidly completing preliminary project research and brainstorming. When the project enters the deepening phase, students can further instruct AI to generate multi-dimensional variations of a single scheme (e.g., changes in composition, color tone, texture), enabling a quick «visual deduction» within a short time. This facilitates better evaluation of design schemes and hones students' judgment and decision-making abilities [1]. Finally, upon project completion, AI can assist in

producing the final design deliverables, environmental renders, finished videos, and post-production output. This technology also necessitates reflection and reform within the higher education system regarding its own teaching. Teaching evaluation must shift from a sole focus on final product outcomes towards a «process-oriented evaluation» that emphasizes the creative process. The key assessment points become the students' understanding and use of AI tools, the logic behind their selection of creative materials, and the meta-cognitive abilities involved in utilizing AI for creative thinking. Simultaneously, the teacher's role must evolve from imparting technical skills to guiding the entire project planning process, mentoring methods for human-AI collaboration, and fostering the development of creative thinking [3].

In summary, the integration of generative AI and project-based learning is a representative new and innovative learning technology in higher education. Its application within the higher education teaching system, particularly in creative majors like art and design, constructs a dynamic, interactive, and personalized learning space. It significantly enhances the depth and effectiveness of student learning and systematically cultivates students' abilities in creative problem-solving and human-AI collaboration literacy, which are essential for future societal development. This points towards a crucial innovative path for the future of higher education.

References

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