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RESEARCH ARTICLE

The "Ai-Idom" Methodological Approach As A Integrated System For Shaping The Ai Competence Of Future Interior Design Educators

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Abstract

This article provides a systematic analysis of the scientific and pedagogical foundations and structural framework for developing the Artificial Intelligence (AI) competence of future interior design teachers. In this study, the integrative nature of AI competence is demonstrated through a quaternary model consisting of a chain of cognitive-knowledge, project-technological, creative-aesthetic, and reflexive-ethical components. The author substantiates a methodology for integrating the capabilities of generative models, prompt engineering, and visual platforms (Midjourney, DALL-E, Stable Diffusion) with traditional professional software (3ds Max, AutoCAD) and elements of national architecture. The article highlights the mutual dialectical relationship between these components and the pedagogical significance of the "AI-IDOM" (Generation – Curation – Integration – Reflection) methodological approach aimed at developing them as a unified whole.

KEYWORDS

Future teacher, interior design, AI competence, cognitive-knowledge, project-technological, creative-aesthetic, reflexive-ethical component, prompt engineering, national architecture, AI-IDOM methodology.

INTRODUCTION

By the third decade of the 21st century, the dramatic breakthrough in generative artificial intelligence (AI) architectures has set entirely new requirements for interior design and its pedagogy, along with all other creative and manufacturing fields. Today, an interior designer is no longer a mere operator executing technical drawings, but a strategic curator capable of engaging in intellectual and creative communication with AI and optimizing the design process through algorithmic systems.

The process of training future interior design teachers within the higher pedagogical education system must not lag behind this technological revolution; on the contrary, it must be transformed accordingly. The AI competence of a future teacher not only determines their personal professional proficiency but also serves as a foundation for shaping the visual and technological culture of the students they will teach in the future. However, in pedagogical research, the structural components of this competence, their mutual dialectical interconnectedness, and their correlation with the specific nature of art education have not yet been sufficiently systematized.

The AI competence of a future interior design teacher is a complex, multidimensional, and structurally integrative professional-pedagogical quality. According to our research, this competence consists of four mutually dialectical components (Table 1).

Table 1: Structural Components and Functional Descriptions of AI Competence

Competence Component	Core Content and Structural Elements	Professional-Pedagogical Significance	Consequences of Underdevelopment (Risks)
Cognitive-Knowledge	The history of AI, neural networks, transformer and diffusion models, and the operating principles of generative systems.	Cognitive perception of AI as an algorithmic system rather than a "magic box."	Blind, mechanical use of technology; inability to analyze errors.
Project-Technological	Prompt engineering, proficiency with Midjourney, DALL-E, and Stable Diffusion, and their synthesis with CAD/3D software.	Optimization of real professional and didactic projects using AI.	Practical skills remaining underdeveloped and superficial without a theoretical foundation.
Creative-Aesthetic	Stylistic thinking, artistic taste, and harmonizing national architectural elements with AI solutions.	Elevating the student from a technical operator to an artistic-creative specialist.	Standardized (templated) design works; loss of national identity.
Reflexive-Ethical	Copyright, academic integrity, critical correction of model "hallucinations" and errors.	Teaching future students the culture of using AI ethically.	Unscrupulous and plagiarism-based technical activity lacking ethical criteria.

The cognitive-knowledge component encompasses a set of consciously mastered concepts regarding the theoretical foundations of artificial intelligence, its historical stages of development, and its core algorithms and architectures — including symbolic AI, machine learning, neural networks, deep learning, and transformers. This component also includes theoretical knowledge about the operating principles of generative models, the capabilities and limitations of AI tools in the field of interior design, the specifics of applying AI in pedagogical practice, and the ethical-legal aspects of the field. It provides the student with the necessary cognitive foundation to apply AI tools in a justified, critical, and responsible manner. Understanding the mechanisms of transformer architectures, diffusion models, and large language models holds particular scientific significance. This specific knowledge allows the student to perceive AI not as a "magic box" but as an algorithmic system, enabling them to independently pose the question "why?" when the output of a model is incorrect or inconsistent. If the cognitive-knowledge component is insufficiently developed, students tend to use AI tools mechanically and without critical reflection, evaluate model outcomes without scientific criteria, and fail to reach pedagogically sound conclusions; in turn, this prevents them from providing proper scientific and methodological guidance to their future students.

The project-technological component is an integrated system of practical skills and proficiencies that directly relies on the cognitive-knowledge foundation and manifests in professional practice. The main structural elements of this component are as follows: first, mastering the techniques of creating effective text-to-visual queries (prompts) and the principles of prompt engineering; second, practical proficiency with various AI platforms such as Midjourney, DALL-E, Stable Diffusion, RoomGPT, ChatGPT, Claude, and others; third, the ability to critically evaluate and compare AI outputs, making a justified

selection of the option that best meets professional and didactic requirements; fourth, the technological integration of AI generations with traditional professional design software (AutoCAD, 3ds Max, SketchUp, Adobe Photoshop); fifth, the strategic and methodologically sound application of AI at all stages of a project — including initial concept formation, sector analysis, sketching, visualization, and final presentation; sixth, the capacity to independently master updated AI tools through a continuous self-learning strategy in a rapidly changing technological environment. This component constitutes the "hands-on" — that is, the practical-instrumental — dimension of AI competence, which manifests directly in actual professional activity.

The creative-aesthetic component represents the ability to generate original design solutions through creative collaboration with artificial intelligence, while developing aesthetic criticality and stylistic thinking. This component encompasses the following skills:

a) redesigning and developing the outputs proposed by artificial intelligence in accordance with one's own creative concept;

b) precise application of artistic styles (classical, modern, art deco, minimalism, biophilic design, ethnic-national style, etc.) using AI tools;

c) preserving artistic taste and aesthetic criteria when working with artificial intelligence;

d) harmonizing national cultural elements (traditional elements of Uzbek architecture, ganch carving, patterns, blue domes) with modern AI solutions;

e) perceiving artificial intelligence not merely as a technical tool, but as a creative collaborator.

This component shapes the student not as a technical operator, but as an artistic-creative specialist.

The reflexive-ethical component is a leading structural element that encompasses a value-oriented attitude and personal experiences regarding the ethical and legal aspects of using artificial intelligence, copyright issues, creative responsibility, and professional self-assessment. The core content-elements of this component consist of the following:

first, a deep understanding of the legal and ethical significance of copyright and intellectual property issues related to AI generations;

second, commitment to the principles of academic and creative integrity (not presenting work performed with the help of tools like ChatGPT, Midjourney, or similar instruments as one's independent creative product);

third, the ability to timely identify and methodically correct the limitations and systemic errors inherent in AI tools — such as "hallucinations", incorrect stylistic interpretations, and cultural-contextual inconsistencies;

fourth, a conscious realization of the pedagogical responsibility to train their future students in the culture of the ethical use of artificial intelligence;

fifth, a disposition toward regular reflexive evaluation of one's own professional activity and continuous professional self-development.

It is this component that is closely and dialectically linked to the future teacher's personal and professional maturity, value position, and social-moral development.

These four components are in a state of profound mutual dialectical interconnectedness, complementing and reinforcing one another; it is within their unified integration that the integrative nature of AI competence is fully manifested. The underdevelopment of any single component leads to the inefficiency of the entire competence system. For instance, a strong project-technological component without the cognitive-knowledge component turns into "blind adherence to technology", and without the reflexive-ethical component, it degenerates into "technical usage devoid of conscientious criteria". Conversely, a solid cognitive-knowledge component, if not complemented by the project-technological component, remains at the level of incomplete theoretical skills; the creative-aesthetic component, if isolated from the reflexive-ethical component, drops to the level of personal aesthetic inclination and fails to convey pedagogical responsibility. From a pedagogical standpoint, this implies a balanced focus on all four components when designing the methodology; designating one of them as "more important" or "to be developed later" relative to the others constitutes a methodological error. The four-stage logical structure of the "AI-IDOM" methodology — namely, "Generation – Curation – Integration – Reflection" — is specifically oriented toward developing this quartet as a unified, integrative whole.

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