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Artificial Intelligence in the Formation of Cultural Competence of Future Designers: The Didactic Aspect of the Creative Economy

Abstract
The subject of this study is the didactic potential of artificial intelligence in the formation of cultural competence among future designers in the context of the creative economy. The article considers cultural competence as an integral professional quality that combines cultural awareness, visual sensitivity, critical interpretation of cultural codes, intercultural communication, ethical responsibility, and the ability to transform cultural experience into design solutions. The aim of the study is to provide a theoretical substantiation of artificial intelligence as a didactic mediator between cultural experience, reflective analysis, and creative design practice. The research methodology is based on an interdisciplinary approach that integrates competence-based education, cultural studies, design pedagogy, digital didactics, concepts of AI literacy, and the theory of creative industries. The study employs theoretical analysis, synthesis, comparison, and pedagogical modelling to clarify the role of artificial intelligence tools in educational practices related to cultural observation, visual research, concept development, and project-based learning. The findings demonstrate that artificial intelligence can help students structure cultural impressions, identify semantic connections, compare visual systems, generate design references, and reflectively comprehend the cultural meanings of creative products. At the same time, artificial intelligence cannot replace personal experience of cultural immersion, the pedagogical role of the teacher, or the student's authorial position. The conclusions emphasise that the effective integration of AI into design education requires a human-centred pedagogical model, ethical regulation, critical evaluation of algorithmic outputs, and the development of AI literacy. Such an approach contributes to the preparation of future designers capable of creating culturally meaningful, innovative, and socially responsible products in the creative economy.

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Keywords
artificial intelligence, design education, cultural competence, creative economy, digital didactics, AI literacy, cultural experience, future designers

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Introduction

The advancement of digital technologies and the rapid expansion of artificial intelligence have significantly transformed the conditions of professional training in the field of design. Design education is no longer limited to the transmission of artistic, technological, and project-related knowledge; rather, it is increasingly oriented toward the development of competences that enable future professionals to interpret cultural phenomena, work with visual meanings, understand intercultural communication, and create innovative products within the creative economy. In this context, the designer acts not only as an executor of a visual task, but also as a mediator of cultural meanings, a creator of symbolic forms, and a participant in the production of social and economic value through creativity.

The relevance of the topic is determined by the fact that the creative economy is based on the transformation of knowledge, culture, imagination, and innovation into products, services, and experiences. Therefore, the professional training of future designers requires the development of cultural competence, which ensures the ability to understand cultural codes, traditions, symbols, styles, visual

narratives, and value systems. Without such competence, design risks remaining technologically effective but culturally superficial. The integration of artificial intelligence into education further complicates this issue, since AI systems can generate images, texts, concepts, and visual references, but they do not possess human cultural experience, ethical judgement, or personal responsibility.

The scientific novelty of the article lies in interpreting artificial intelligence not merely as a digital tool for automating educational or creative tasks, but as a didactic mediator of cultural experience. This approach is consistent with the research priorities of the Institute of Pedagogy of the National Academy of Educational Sciences of Ukraine, within which the modernisation of educational content, didactic support for the educational process, and the development of competence-oriented learning are particularly emphasised (Instytut pedahohiky NAPN Ukrainy, 2024).

Such mediation means that AI can help students move from direct observation of cultural phenomena to their analytical interpretation, reflective comprehension, and creative transformation into design projects. At the same time, this mediation must remain pedagogically guided and critically controlled. The human-centred position of the teacher and the authorial responsibility of the student are necessary conditions for preserving the cultural depth and ethical value of design solutions.

The aim of the article is to provide a theoretical substantiation of the didactic potential of artificial intelligence in the formation of cultural competence among future designers as an important condition of their professional readiness for creative activity in the context of the creative economy.

The objectives of the study are as follows: to clarify the relationship between cultural competence and the needs of the creative economy; to define the didactic functions of AI in design education; to identify pedagogical conditions and risks associated with AI integration; and to outline prospects for the further development of this approach in educational practice.

The logic of the article corresponds to the interdisciplinary nature of the problem under study. First, the article examines cultural competence as a component of the professional training of future designers and as a resource of the creative economy. It then analyses artificial intelligence as a didactic mediator that supports cultural interpretation, visual analysis, and project-based learning. The article further considers the pedagogical role of the teacher, the importance of AI literacy, and the risks associated with algorithmic bias, cultural simplification, loss of authorship, and excessive dependence on digital systems. The final section presents conclusions and prospects for further research.

2 Historiography of the Problem of Forming Cultural Competence among Design Students

The problem of forming cultural competence among future designers is considered within several interrelated research areas: competence-based education, design pedagogy, cultural studies, art education, and the theory of the creative economy. In the works of Ukrainian scholars, the competence-based approach is interpreted as an orientation of education towards an individual's ability to act in real professional and sociocultural situations, rather than merely reproduce knowledge (Ovcharuk, 2004). This position is especially significant for design education, because the professional activity of a designer involves working with cultural codes, visual systems, symbols, styles, identities, and value meanings.

The studies of V. Danylenko, Ye. Antonovych, and S. Alieksieieva emphasise the need to combine artistic-design, technological, cultural, and creative components in the training of future designers (Danylenko, 2003; Antonovych, 2009; Alieksieieva, 2024). In the context of the creative economy, these provisions acquire additional relevance, since contemporary creative industries develop at the intersection of culture, knowledge, technology, intellectual property, and innovation. UNCTAD defines the creative economy as a sphere based on the interaction of human creativity, ideas, knowledge, technology, and intellectual property (UNCTAD, 2022).

A separate direction of contemporary research concerns the use of artificial intelligence in education, as well as in the cultural and creative industries. UNESCO international documents emphasise that generative AI should be implemented in education on the basis of human-centredness, responsibility, pedagogical appropriateness, and preservation of the leading role of teachers and learners (Miao & Holmes, 2023). European ethical guidelines for trustworthy AI stress the need for legality, ethics, transparency, non-discrimination, accountability, and human oversight of algorithmic systems. At the same time, the adoption of the EU Artificial Intelligence Act brings into focus the regulation of risks, safety, and responsible AI use in various areas of society, including education and the creative industries.

The research of S. Schauer and K. Simbeck directly links AI literacy with cultural and design studies, substantiating the need to include in educational programmes such components as technical understanding of AI, critical evaluation of its outputs, and practical application in cultural and design projects (Schauer & Simbeck, 2024). Thus, the analysis of scholarly sources provides grounds for considering AI not as a substitute for cultural experience or the student's authorial thinking, but as a didactic mediator that can support the analysis, interpretation, reflection, and creative transformation of cultural material in design education.

3 Cultural Competence of Future Designers

The cultural competence of students majoring in design can be understood as an integral quality that combines knowledge of culture, the ability to interpret cultural phenomena, sensitivity to visual forms, understanding of symbolic systems, intercultural communication, and readiness for the creative transformation of cultural experience. This competence is closely related to the competence-based approach in education, according to which the learning outcome is not only the accumulation of knowledge, but also the ability to act effectively in professional and sociocultural situations (Ovcharuk, 2004). For design education, this means that students should be able to read and interpret cultural signs, understand the historical and social context of visual forms, and responsibly use cultural meanings in project activity.

In the context of the creative economy, cultural competence becomes not an additional humanities component, but a key professional resource. The value of design products is created not only by their functionality or technological quality, but also by their ability to convey meanings, evoke emotions, represent identities, and participate in cultural exchange. Creative industries function at the intersection of culture, technology, the market, and social communication. Therefore, a designer who lacks cultural awareness may reproduce stereotypes, use cultural symbols superficially, or create visually attractive but semantically weak products.

In this context, the studies of S. Alieksieieva are also important. They examine the professional training of future designers in connection with the development of creative industries, the renewal of educational content, and the need to form the future specialist's ability to act under conditions of sociocultural and technological change (Alieksieieva & Adamovska, 2025). For this reason, the cultural competence of a future designer should be considered not only as a humanities component of education, but also as a professionally significant quality that ensures the ability to create culturally meaningful and competitive design products.

The theoretical foundations of design education emphasise the need to integrate artistic, technological, and cultural components in the training of future specialists. Ukrainian researchers in the field of design pedagogy have repeatedly stressed the importance of artistic-design thinking, cultural context, and creative interpretation for the formation of professional competence (Antonovych, 2009; Danylenko, 2003). This approach is particularly relevant today, as digital tools expand the possibilities of visual production while simultaneously increasing the risk of standardisation and imitation. The task of education, therefore, is to form not only technical skills, but also the ability to make culturally grounded and ethically responsible design decisions.

Cultural competence is also connected with experience-oriented learning. Direct contact with cultural environments, museums, urban spaces, architecture, local traditions, and visual landscapes provides students with material for observation, emotional experience, and professional reflection. According to the logic of experiential learning, knowledge is formed through the transformation of experience (Kolb, 1984). For future designers, this transformation takes place when cultural impressions are converted into concepts, mood boards, visual systems, prototypes, or completed design projects. In this context, artificial intelligence can perform an auxiliary analytical and interpretive function in the processing of cultural experience. However, it cannot replace the student's direct personal immersion in a cultural environment, which is the basis for the emotional, value-based, and professional comprehension of culture.

4 AI as a Didactic Mediator of Cultural Experience

Artificial intelligence opens up new possibilities for the didactic organisation of design education. AI-based systems can process visual, textual, and audiovisual data; support the search for cultural analogies; generate references; compare stylistic features; summarise information; and assist in the development of project concepts. In this sense, AI can perform the function of a didactic mediator between cultural experience and design representation. It helps students structure impressions, formulate hypotheses, identify semantic connections, and move from intuitive perception to conscious interpretation.

The mediating function of AI is especially significant in tourism-educational practices, field observations, and project-based learning. When working with cultural environments, students collect visual materials, sketches, photographs, notes, narratives, and personal impressions. AI tools can help them organise these materials, group visual features, propose historical or stylistic contexts, and formulate questions for further analysis. Such use of AI supports reflective learning and encourages students to compare their own interpretations with additional digital outputs. However, AI results should not be accepted uncritically. They must be verified, discussed, and correlated with validated sources, cultural context, and pedagogical guidance.

International documents on artificial intelligence in education emphasise the need for a human-centred approach. UNESCO recommendations stress that generative AI should support human potential and should not replace the responsibility of teachers and educational institutions (Miao & Holmes, 2023). The European approach to trustworthy AI also emphasises human agency, transparency, accountability, safety,

non-discrimination, and data protection (High-Level Expert Group on Artificial Intelligence, 2019). These principles are important for design education because products created with the help of AI can influence cultural representations, visual identities, and social communication.

In the educational process, artificial intelligence can perform not one but several interrelated didactic functions. First of all, this concerns the analytical function, which consists in identifying visual structures, cultural codes, symbolic images, and semantic connections in works of art, design, architecture, or the urban environment. Thanks to this function, students have an opportunity to perceive hidden cultural meanings more deeply and understand their significance for future professional activity.

The heuristic function of AI is no less important, as it contributes to the generation of ideas, the search for alternative design solutions, the selection of references, and the modelling of different variants of a creative concept. In this context, artificial intelligence can act as a kind of intellectual partner that stimulates creative thinking, while not replacing the student's authorial position.

The reflective function acquires particular importance, since AI can help students analyse their own learning experience, compare the initial idea with the final result, identify the strengths and weaknesses of a project, and assess its cultural depth. This approach contributes to the formation of the future designer's professional self-awareness and to the development of the ability to critically comprehend one's own creative practice.

At the same time, the communicative function of artificial intelligence is manifested in supporting the process of formulating design concepts, preparing presentation materials, structuring argumentation, and adapting project ideas to different audiences. This is especially important for future designers, because professional activity involves not only the creation of a visual product, but also the ability to explain convincingly its cultural, aesthetic, and social value.

In addition, AI can perform an evaluative-supportive function by helping teachers conduct a preliminary analysis of students' works, identify their strengths, problematic aspects, level of compliance with the task, and potential for further improvement. However, final pedagogical assessment must remain the teacher's responsibility, because it requires human judgement, professional experience, ethical sensitivity, and an understanding of the student's individual developmental trajectory.

Thus, artificial intelligence expands the possibilities of the educational environment and makes it more flexible, analytically rich, and technologically open. At the same time, it does not eliminate the need for human thinking, pedagogical interaction, personal reflection, and professional judgement, which remain key factors in high-quality design education.

A key condition for the productive integration of AI is AI literacy. Researchers note that students of cultural and design studies should understand not only how AI tools work, but also their social, ethical, cultural, and professional implications (Schauer & Simbeck, 2024). For future designers, AI literacy encompasses the ability to formulate prompts, verify outputs, recognise bias, respect intellectual property, avoid cultural appropriation, and preserve authorial responsibility. Without such literacy, AI can become a source of superficial creativity, imitation, and dependence on algorithmic suggestions.

5 Pedagogical Conditions for the Formation of Cultural Competence through the Use of AI

The effective use of artificial intelligence in the formation of cultural competence requires a new pedagogical position of the teacher. The works of S. Alieksieieva emphasise the relevance of didactic systems, individualisation of learning, the design of educational trajectories, and the renewal of pedagogical conditions for organising the educational process (Alieksieieva, 2024). This provides grounds for considering the teacher in AI-mediated design education not only as a transmitter of knowledge, but also as a tutor, facilitator, curator, and moderator of cultural interpretation.

Such a position presupposes the design of cultural routes, the organisation of project tasks, the moderation of discussions, the selection of digital tools, and the critical interpretation of materials created with the help of AI. The teacher helps students transform cultural observations into conceptual design solutions and prevents the reduction of culture to simplified algorithmic templates.

Pedagogical modelling of AI-supported design education should provide for several conditions. First, AI should be integrated into meaningful learning tasks rather than used as an isolated technological novelty. Second, every activity involving AI should be connected with cultural interpretation, critical reflection, and a project outcome. Third, students should compare AI-generated results with their own observations as well as with academic or cultural sources. Fourth, the educational process should maintain a balance between technological experimentation and humanistic values. Fifth, assessment should take into account not only the final design product, but also the process of cultural analysis, ethical reasoning, and reflective self-assessment.

The integration of AI into design education is also associated with significant risks. Algorithmic systems may simplify complex cultural phenomena, reproduce stereotypes, ignore local contexts, or generate visually impressive but culturally inaccurate images. In the creative economy, these risks are amplified by the speed of production and the demand for commercially

attractive content. There is a danger that students may begin to rely on ready-made algorithmic solutions instead of developing independent visual thinking. Another risk concerns authorship and intellectual property, since AI-generated content raises questions of originality, citation, ownership, and responsibility.

For these reasons, AI should be understood as an educational partner only within clear pedagogical, ethical, and cultural boundaries. The final decision regarding meaning, form, value, and responsibility must belong to the human subject. Future designers should learn to use AI as a tool for expanding creative possibilities, not as a replacement for cultural experience or professional thinking. This approach corresponds to the needs of the creative economy, in which innovativeness must be combined with cultural sensitivity, social relevance, and ethical responsibility (European Commission, 2022; UNESCO, 2024).

A generalised model for the formation of cultural competence among future designers through the use of artificial intelligence is presented in Fig. 1.

6 Conclusions

The theoretical analysis conducted in this study makes it possible to formulate several conclusions regarding the didactic potential of artificial intelligence in the formation of cultural competence among future designers in the context of the creative economy.

First, cultural competence should be regarded as a necessary component of the professional training of future designers. It ensures the ability to interpret cultural codes, symbols, visual systems, traditions, and social meanings. In the creative economy, this competence becomes a resource for creating innovative products that have not only aesthetic and functional value, but also cultural and communicative value.

Second, artificial intelligence can be theoretically substantiated as a didactic mediator of cultural experience. It supports the transition from direct cultural observation to analytical interpretation, reflective comprehension, and creative transformation. AI tools can help students organise cultural impressions, compare visual materials, identify semantic connections, generate references, and develop design concepts. At the same time, such mediation is productive only when it remains human-centred and pedagogically guided.

Third, the integration of AI into design education requires the development of AI literacy. Future designers should understand the possibilities and limitations of algorithmic systems, be able to verify information, recognise bias, protect authorship, respect cultural diversity, and use digital tools ethically.

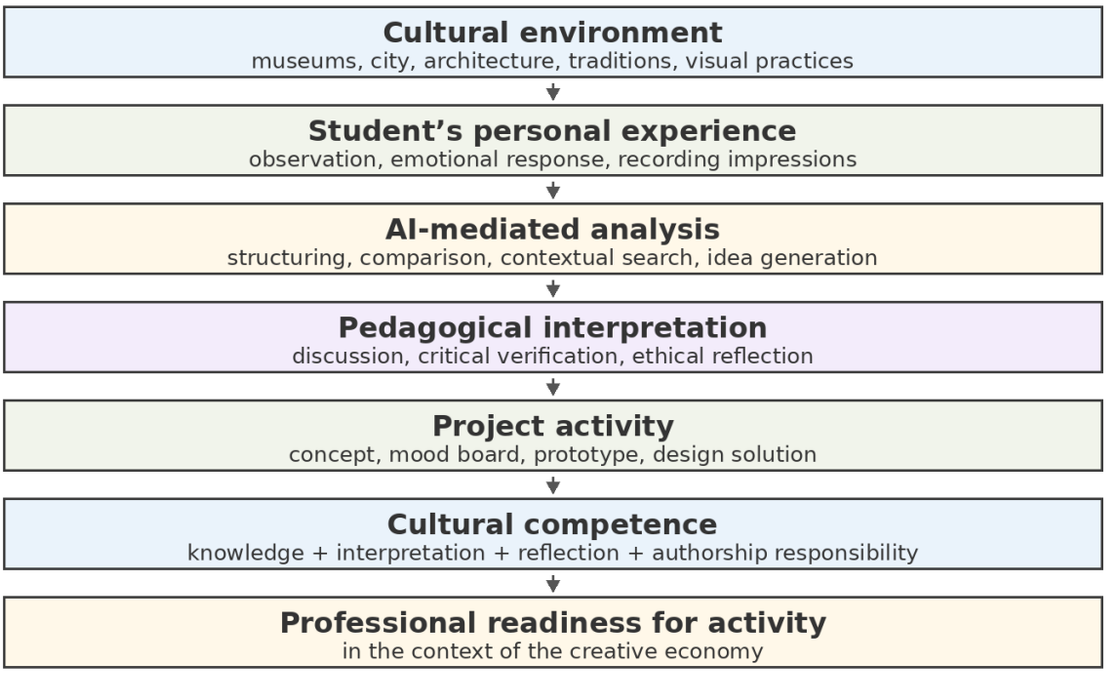

FIGURE 1 Generalised model for the formation of cultural competence among future designers through the use of artificial intelligence

Note. The model reflects the sequence of transition from the student's direct cultural experience to AI-mediated analysis, pedagogical interpretation, project activity, and the formation of the future designer's professional readiness for activity in the creative economy

Source: developed by the author

Therefore, AI literacy should be included in designers' professional competence as a condition for responsible participation in creative industries.

Fourth, the role of the teacher becomes strategically important. In AI-supported education, the teacher acts as a tutor, facilitator, curator, and moderator of cultural interpretation. The teacher designs educational situations in which students do not simply receive AI-generated answers, but analyse, question, compare, and transform them into meaningful design solutions. Such a pedagogical position protects students from superficial digital imitation and supports the development of independent creative thinking. This approach correlates with contemporary didactic research conducted at the Institute of Pedagogy of the National Academy of Educational Sciences of Ukraine, which emphasises the importance of individualisation of learning, renewal of educational content, and creation of pedagogical conditions for the development of learners' independence, reflectivity, and professional subjectivity (Instytut pedahohiky NAPN Ukrainy, 2024; Alieksieieva, 2024).

Fifth, the use of AI in design education is accompanied by risks, including cultural simplification, algorithmic bias, loss of authenticity, dependence on ready-made prompts, problems of authorship, and the possible standardisation of visual language. These risks require systematic pedagogical reflection, ethical regulation, and the preservation of human responsibility in the creative process.

Prospects for further research are associated with the development of methodological models of tourism-educational practices supported by AI, the creation of criteria for assessing cultural competence in AI-mediated design projects, and the analysis of real educational cases in art and design academies. Further research should also clarify how AI tools influence students' authorship, visual thinking, cultural sensitivity, and ability to create socially responsible products in the creative economy.

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