

# Adaptation of Blended Learning to the Needs of Forming Interdisciplinary Competence of Future Graphic Designers

LI Yida <sup>1</sup>

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**Abstract.** The article examines the peculiarities of adapting blended learning to the modern requirements of graphic designers' training, in particular in the context of interdisciplinary competence development. The relevance of the topic is due to the intensification of integration processes in professional education, the need to combine technical, artistic, communicative and analytical knowledge within a single educational process, as well as active digitalisation, which changes not only the tools but also the pedagogical logic of design training. The purpose of the study is to provide a scientific substantiation of the ways of transforming blended learning in accordance with the tasks of developing the interdisciplinary competence of future design professionals. The methodological basis of the article is a structural and functional analysis of educational models, a comparative approach to evaluating pedagogical conditions, and elements of content analysis of programmes and platforms used in design education. It has been established that using a blended format is possible only with a methodical combination of project-based learning, case studies, facilitation, reflection, and digital modelling. Important problems have been identified, including infrastructural limitations, fragmentation of methodological support, and insufficient integration of educational content. It has been proven that blended learning loses its potential for developing a new type of professional competence without pedagogical support, adapted digital tools and interdisciplinary tasks. The scientific novelty is the proposed structuring of digital tools by the types of cognitive influence on creative thinking, as well as the clarification of the didactic conditions for integrating knowledge in a flexible educational environment. The results of the study highlight the practical conditions for the effective implementation of blended learning with the active use of digital technologies in the professional training of future graphic designers. Prospects for further research are related to the development of models for assessing interdisciplinary competence in digital design and analysing the effectiveness of using simulated project tasks in a blended learning system.

**Keywords:** digital educational environment, creative thinking, knowledge integration, project-based learning, design training.

## Адаптація змішаного навчання до потреб формування міждисциплінарної компетентності майбутніх графічних дизайнерів

**Анотація.** У статті досліджено особливості адаптації змішаного навчання до сучасних вимог підготовки графічних дизайнерів, зокрема в контексті формування

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<sup>1</sup> PhD Student at the Department of Educology and Pedagogy, Western Ukrainian National University, 337447558lyd@gmail.com, <https://orcid.org/0009-0007-3430-890X>

міждисциплінарної компетентності. Актуальність теми зумовлена посиленням інтеграційних процесів у професійній освіті, потребою поєднувати технічні, художні, комунікативні та аналітичні знання в межах єдиного освітнього процесу, а також активною цифровізацією, що змінює не лише інструментарій, а й педагогічну логіку дизайнерської підготовки. Метою дослідження є наукове обґрунтування шляхів трансформації змішаного навчання відповідно до завдань розвитку міждисциплінарної компетентності майбутніх фахівців у сфері дизайну. Методологічну основу статті становлять структурно-функціональний аналіз освітніх моделей, компаративний підхід до оцінювання педагогічних умов, а також елементи контент-аналізу програм і платформ, що використовуються в навчанні дизайнерів. Установлено, що ефективне застосування змішаного формату можливе лише за умови методичного поєднання проєктного навчання, кейс-методів, фасилітації, рефлексії та цифрового моделювання. Виявлено важливі проблеми, зокрема інфраструктурні обмеження, фрагментарність методичного забезпечення, недостатня інтегрованість навчального контенту. Доведено, що без наявності педагогічної підтримки, адаптованих цифрових інструментів та міждисциплінарно зорієнтованих завдань змішане навчання втрачає потенціал до розвитку професійної компетентності нового типу. Наукову новизну становить запропонована структуризація цифрових інструментів за типами когнітивного впливу на креативне мислення, а також уточнення дидактичних умов інтеграції знань у гнучкому освітньому середовищі. У результатах дослідження виокремлено практичні умови ефективної реалізації змішаного навчання з активним використанням цифрових технологій у професійній підготовці майбутніх графічних дизайнерів. Перспективи подальших досліджень пов'язані з розробленням моделей оцінювання міждисциплінарної компетентності в умовах цифрового дизайну та аналізом ефективності використання симульованих проєктних завдань у системі змішаного навчання.

**Ключові слова:** цифрове освітнє середовище, креативне мислення, інтеграція знань, проєктне навчання, дизайнерська підготовка.

### Introduction

In the current context of the digital transformation of education, there is a need to rethink traditional models of training creative professionals, including graphic designers. Changes in the professional environment caused by the rapid development of information technology, multimedia platforms and the increasing role of interdisciplinary interaction highlight the need for students to develop professional knowledge and flexible competencies that ensure effective communication, creative thinking and the ability to integrate knowledge from different fields. In this context, interdisciplinary competence is particularly important, enabling future graphic designers to function effectively in the face of constantly changing technological, aesthetic and communicative requirements. Traditional forms of education are insufficient to implement such an integrated approach, which makes it necessary to introduce blended learning as an adaptive educational model. Blended learning allows combining the capabilities of digital technologies with the benefits of face-to-face interaction, providing flexibility in designing the learning environment, variability in the choice of learning resources, and individualisation of the professional growth trajectory. The problem lies in the need for scientifically based adaptation of blended learning models to the specifics of interdisciplinary competence in design, which involves the development of appropriate methods, assessment tools, and pedagogical conditions aligned with the current demands of the creative industry and the challenges of professional training. This task is of both theoretical and applied importance, as overcoming this problem will help to improve the quality of design education, its adaptability to the labour market and ensure the competitiveness of specialists at interdisciplinary intersections.

The analysis of scientific sources on the problem of adapting blended learning to the needs of forming interdisciplinary competence of future graphic designers shows a strong interest of scientists in this area.

Researchers pay attention to the theoretical justification of blended learning as a concept of the integration of traditional and digital educational models. In particular, M. H. Husain conducts a comparative analysis of traditional, e-learning and blended learning formats, in which the latter is preferred due to its flexibility in combining practical and theoretical knowledge [1]. K. R. Graham defines blended learning as the basic form for the development of an adaptive educational environment [2]. The philosophical foundations and cognitive effects of the blended approach are analysed by M. Liu, G. Zhao, Z. Zhong, J. Ma, W. Wang, paying attention to its impact on individual educational trajectories [3]. The potential of blended learning in higher education is considered by R. Castro, determining its ability to promote the development of independence and transdisciplinary thinking [4].

Empirical studies of the effectiveness of blended models in graphic arts education are important. Scientists N. Olmedo-Torre, M. Martínez, and M. Peña prove that active learning in the structure of a blended course in graphic engineering increases the involvement of students, promotes better learning and the development of visual thinking [5]. Scientists N. Peimani and H. Kamalipour analyse the experience of students during the pandemic and emphasise that the blended format ensured the preservation of interaction and creative activity [6]. K. Fleischmann demonstrates how the use of digital platforms and virtual tools in a blended format preserves the practical component of design education and allows for the development of autonomy [7].

The use of digital tools, visual platforms, and methodological models in a mixed format is also the subject of scientific attention for Ukrainian and foreign scholars. In particular, S. Pumahapinyo, P. Suwannathachote, and K. Wiwitkun Kasem propose a model that integrates infographics and cognitive tools and is aimed at developing the creativity of students of artistic specialities [8]. Researchers L. I. Bilousova, L. E. Gryzun, and N. V. Zhytienova demonstrate the effectiveness of blended learning of UI/UX design basics through interactive methods that allow for interdisciplinary immersion [9]. Instructional design in the context of blended learning is described by J. Valverde-Berrocoso and M. R. Fernández-Sánchez, offering a methodological framework for building courses focused on the integration of disciplines [10].

Some scholars focus on the study of pedagogical models and methodological approaches to adapt blended learning to the specifics of design training. The experience of applicants of different design directions is analysed by S. T. Pektas, M. O. Gurel, emphasising the need to adapt the structure of blended learning to the professional profile [11]. Scientists X. Fei, N. N. Mohamad Nizar, and C. A. Ladin, as part of a systematic review, identify existing models of blended learning in design education and form research guidelines for the future [12]. The effectiveness of the methodological model for the development of artistic and graphic skills based on the integrative principle, which contains aesthetic, technical and conceptual components, is proved by A. Maksymchuk, O. Shvets, T. Shtainer, I. Petrova, N. Kravchenko, O. Abramova [13]. N. Averyanova and L. Huk emphasise the need to update design educational programmes, taking into account a blended approach and digital transformation in the context of the Ukrainian education system [14]. The basic principles of graphic design as a foundation for building adaptive educational strategies that can be effectively implemented in a blended format are systematised by G. Ambrose, P. Harris, and N. Ball [15].

Despite the growing attention to blended learning in higher education, its role in the formation of interdisciplinary competence of future graphic designers remains insufficiently studied. The available research is mostly focused on the technical aspects or general advantages of the hybrid format, while the issues of methodological combination of digital tools with the development of creative thinking, integration of knowledge from different fields and creation of pedagogical conditions adapted to design specifics require additional attention. There is also

limited analysis of the cognitive impact of digital platforms on students' ability to conceptualise, visualise and interact in teams.

The issues of personnel training for blended learning, in particular the role of the teacher as a facilitator of interdisciplinary interaction, as well as infrastructural and didactic obstacles that hinder the development of flexible educational models in design education, are limitedly disclosed. The proposed study aims to overcome these gaps by systematising methodological approaches, typologising digital tools according to their educational function, and summarising the practical conditions for implementing a blended format, allowing for an expanded scientific understanding of integrative professional training in digital transformation.

*The purpose* of the article is to scientifically substantiate the peculiarities of adapting blended learning to the needs of forming the interdisciplinary competence of future graphic designers in the context of digitalisation of education and transformation of professional requirements in the design field.

Objectives of the article:

- 1) to investigate the potential of blended learning for the formation of interdisciplinary competence of future graphic designers and to identify its main pedagogical conditions;
- 2) to analyse methodological approaches, digital technologies and interactive platforms that promote the development of creative thinking and integration of knowledge in a blended learning format;
- 3) to identify the main obstacles to the implementation of blended learning in design education and provide practical recommendations for improving educational models in line with current professional challenges.

### **Materials and methods**

The research materials were open digital platforms and tools actively used in training graphic designers in a blended format, including Figma, Miro, Adobe Creative Suite, Canva, and Google Workspace. In addition, analytical data on current practices of using interactive methods in professional design education and scientific sources on interdisciplinary integration and digital transformation of the educational environment were analysed.

The methodological basis of the study was the structural and functional approach, which allowed for the identification of the educational potential of blended learning in the formation of interdisciplinary competence, and a comparative analysis of digital platforms and pedagogical tools according to the criteria of cognitive efficiency, interactivity and adaptability. The content analysis of publications and platforms helped to identify current didactic trends and problems. Elements of the systematic approach were used to summarise the obstacles and develop recommendations for optimising blended models by the professional requirements of design activity. The applied methodology provided comprehensive coverage of the phenomenon under study, taking into account technological, cognitive and didactic factors.

### **Results**

The modern system of graphic design education is increasingly focused on integrating knowledge from related fields, which necessitates the development of interdisciplinary competence as an important element of professional capacity. Given the complexity of the tasks professionals face, the educational process should be flexible, adaptive and open to interdisciplinary interaction. In this context, blended learning emerges as an effective pedagogical model that combines the benefits of traditional face-to-face interaction and digital learning environments, helping to expand the cognitive space of students. Through combining individualised digital resources, project-based learning, visual modelling, small group interaction, and integration of disciplines, blended learning allows for developing critical thinking, creativity, teamwork skills, and a systematic vision of project tasks (Table 1).

Table 1

**The potential of blended learning in the formation of interdisciplinary competence of future graphic designers**

<b>Blended learning capacity component</b>	<b>Characteristics from the point of view of interdisciplinary competence development</b>	<b>Examples of implementation in design education</b>
Flexibility of the educational environment	Provides individualisation of the educational trajectory and a choice of topics from various fields	Online courses on perception psychology, colour theory, media law
Integration of digital and traditional methods	Allows you to combine technical skills with humanitarian and social knowledge	Video lectures on art history and workshops on creating visual content
Modularity and project-based learning	Promotes the integration of knowledge from different disciplines within a single project	Developing branding for a social project with based on sociological analysis
Collaboration in online and offline formats	Develops teamwork skills with different specialists	Interdisciplinary workshops with the participation of students of educational programmes in the fields of IT and marketing
Digital platforms and visual tools	Enhance visual and analytical thinking and help integrate complex data	Using Figma, Adobe XD, Miro to integrate ideas from different areas

Source: compiled by the author on the basis of [1; 3; 4; 5; 6; 10]

The components presented in Table 1 reveal the main components of the potential of blended learning in developing interdisciplinary competence in future graphic designers. The flexibility of the educational environment provides the ability to adapt the learning content to the individual needs of students, which is important for developing the ability to work with materials from different fields of knowledge. Combining traditional teaching methods and digital tools contributes to a deeper understanding of theoretical concepts and their practical application in design, especially when visualising socially important topics. The modular and project-oriented organisation of the educational process contributes to forming integrated knowledge by implementing case studies that require simultaneous consideration of technical, ethical, cultural and communicative aspects. Collaboration in a blended format – both through digital platforms and face-to-face discussions – contributes to developing team problem-solving skills, a prerequisite for effective interdisciplinary work [14]. Of particular importance is the use of digital platforms that allow the implementation of design solutions and the organisation of joint work with analysts, marketers, and sociologists involved in projects.

In practical terms, the potential of blended learning is demonstrated in courses that integrate social, visual, and technological components. For example, as part of the Design for Social Impact Lab educational programme, students work on real cases to develop visual solutions to social challenges [16]. The course involves a mixed format: synchronous online lectures, independent work with theoretical modules, consultations with experts from various fields, and in-person project presentations. This structure helps not only to master design tools, but also to develop the ability to critically analyse a problem, communicate with representatives of different fields, and integrate knowledge into practical visual products. The programme aims to train designers who can influence social processes through interdisciplinary collaboration and design thinking.

In the professional training of future graphic designers, teaching methods that combine theoretical knowledge acquisition with practical experience in a flexible educational environment are of particular relevance. Blended learning opens up opportunities for implementing methodological approaches that can integrate elements of face-to-face and distance learning, ensure interdisciplinary communication, individualise educational trajectories and develop creative thinking. The methodological effectiveness of the blended format in design education lies in the fact that it allows you to combine classical methods (lectures, practical assignments) with modern digital ones (facilitation sessions, case analysis, project sprints, portfolio method). The result of this combination is not only the acquisition of professional skills, but also the development of the ability to integrate knowledge from different fields and apply it in new, changing project conditions (Table 2).

Table 2

**Methodological approaches to the implementation of blended learning in the training of graphic designers**

Teaching method	The essence of the method in the context of a mixed format	Expected outcome for interdisciplinary competence
Project-based learning method	Performing a practical task in teams with elements of online and offline work	Integrating knowledge from different disciplines and developing creative solutions
Case study method	Analysis of real or simulated situations from professional practice	Developing analytical thinking and understanding of the social context
The portfolio method	Creation of a digital dossier with examples of completed tasks	Ability to present the results of interdisciplinary activities
Facilitation method	Conducting discussions and group sessions using online whiteboards	Development of communication, cooperation and knowledge exchange between industries
Scenario modelling method	Create visual solutions based on predefined scenarios or roles	Developing the ability to think within complex interdisciplinary constraints

Source: compiled by the author on the basis of [5; 6; 7; 9; 10; 13]

For example, the project-based learning method shifts the focus from reproducing knowledge to its productive application in creative cases, which occurs in synchronous teamwork (offline or online) and independent study. The case analysis method allows you to develop analytical competencies by considering real or simulated situations in communication design, advertising, urban environment or social marketing that require consideration of both visual and behavioural, ethical and economic factors. The portfolio method is focused on the gradual accumulation and structured presentation of performance results, which meets the modern requirements for design professionals to be able to create and demonstrate their solutions with arguments. The facilitation method enhances the role of group interaction through the organisation of thematic sessions in a digital environment (for example, in Miro [17]), facilitating the free exchange of knowledge between students with different levels of academic training. Scenario modelling, which is often used in the process of UX design or visual storytelling, allows you to form a systemic vision of the task under conditions of uncertainty, flexibly adapting design solutions to a dynamic environment.

The Ukrainian course "Product Design" by Projector Institute combines these methods into a single structure: students analyse specific business requests (case method), work in teams on a visual concept (project method), document their progress in a digital portfolio, and constantly discuss the results with mentors and colleagues (facilitation) [18]. Scenario-based exercises accompany classes to model user behaviour, build journey maps, and create

interactive prototypes. Such a set of methods, implemented in a blended format, not only enhances professional competence but also forms the ability of students to integrate knowledge of marketing, psychology, programming, and communication within a holistic design product. Thus, the effectiveness of blended learning in design education is due to the methodological combination of complementary approaches that support flexible, independent and cooperative learning. In the blended learning of graphic designers, digital tools play the role of presentation or communication tools and full-fledged methodological resources for developing creative thinking, knowledge visualisation and interdisciplinary integration. They activate the ability to think conceptually, support a flexible content structure, promote creative reflection and co-creation of solutions. Using such tools in the educational process allows you to vary the level of abstraction, combine visual and analytical formats, and organise both individual and teamwork, which is important for design as an integrative discipline. Digital tools in a mixed format can be conditionally classified according to their functional characteristics: tools for visualisation, for facilitating thinking, for organising collaboration, for digital modelling, and for structuring knowledge (Table 3).

Table 3

**Types of digital tools in blended learning to develop creative thinking and interdisciplinary integration**

Type of digital instrument	Function in the educational process	Educational effect in a mixed format for designers
Visualisation tools	Create graphic images, models, diagrams	Development of spatial thinking, ability to visual synthesis
Facilitation and analytical tools	Building mind maps, scenarios, classifications	Formation of conceptual thinking, analytical structuredness
Collaborative online services	Teamwork in collaborative editing mode	Development of communication, cooperation, cross-disciplinary integration
Prototyping and mock-up platforms	Creation of digital prototypes, mockups, UI interfaces	Development of technical creativity, ability to design function and form
Interactive multimedia tools	Building presentations, interacting with content	Ability to work at the intersection of text, image and knowledge structure

Source: compiled by the author on the basis of [3; 8; 9; 13; 15]

The classification of digital tools in Table 3 allows us to understand their use in blended learning in graphic design, where creativity is realised through visual, analytical and communicative thinking. For example, visualisation tools include Adobe Illustrator [19] and Canva [20], which allow you to develop complex compositional solutions and instantly adapt them to different formats, which is necessary when working with integrated tasks. Facilitation and analytical tools, such as Miro [18], construct logical structures, idea maps, and user behaviour scenarios, which is especially important when developing complex concepts in a team. Collaborative services, such as Google Docs [21] or Zoom [22] with commenting functions, allow students to work together on one project flexibly, combining online and offline activities. Prototyping tools (Figma [23]) provide the implementation of UI/UX tasks and real-time hypothesis testing, which activates iterative thinking. Finally, multimedia tools like Google Slides or Adobe Express [24] allow presenting results by combining visual language with a logical structure. The practical application of this system can be observed in the UX/UI Design programme on the Creative Practice platform [25], where all these types of digital tools are

combined within a learning sprint, and creative thinking is developed as a product of integration with technical, communication and cultural knowledge.

Implementing blended learning as an effective form of organising the educational process in the training of future graphic designers is accompanied by several obstacles that hinder its full functioning in forming interdisciplinary competence. First, we are talking about infrastructural constraints related to insufficient provision of material and technical resources, lack of stable access to digital platforms and cloud services, and unified environments in which interaction between the teacher and the student occurs. In a context where design education requires the use of resource-intensive visual tools such as Figma [23], Adobe Creative Cloud [26], or 3d modelling tools, the imperfection of digital infrastructure leads to a limitation of interactive and interdisciplinary practices [4]. In addition, the staffing problem caused by teachers' insufficient level of digital competence, lack of understanding of the specifics of the pedagogical logic of blended learning, and lack of motivation to implement it is a constraining factor. This makes it impossible to fully implement integrative teaching methods that require simultaneous work with multimedia content, a communication platform, and analytical services.

Didactic obstacles manifest in the inflexible structure of curricula, the focus on traditional forms of knowledge testing, and the limited availability of teaching materials adapted to interdisciplinarity and digital interaction requirements. In particular, in many higher education institutions, academic disciplines are still taught in an isolated format, without holistic coordination with other components of the curriculum [5]. This makes it challenging to apply cross-disciplinary decision modelling methods, for example, in interface design, which requires knowledge of marketing, cognitive psychology, cultural studies, and software design. The lack of methodological support for blended learning, which would be focused on design education, creates a gap between the technical capabilities of the platform and the real pedagogical scenarios teachers use [13].

Improving blended learning models in graphic design should consider both the specifics of designers' professional activities and the growing need for interdisciplinary interaction, covering technological, humanitarian and social components. One of the main areas of optimisation is the introduction of adaptive educational trajectories that allow you to vary the content and pace of learning depending on the level of training of the applicant, the type of task and the direction of design (UI/UX, communication, motion graphics, etc.). This implies a structured blended course based on the modular principle, where each block contains a theoretical part (asynchronously), a practical task (visual or analytical), and an interactive component (facilitation session, peer review, case discussion).

It is recommended to expand the use of cross-platform content that combines text, graphics, video, animation, and analytical diagrams, creating conditions for engaging students in multi-format interaction with educational material. This contributes to developing visual literacy, creative thinking and the ability to transform knowledge into functional design solutions. It is also effective to integrate simulated interdisciplinary projects into the educational process that model real-world tasks at the intersection of design, marketing, consumer psychology, programming, and social communications. Such cases allow students to apply their knowledge and practice their skills in interacting with representatives of other industries.

The development of digital pedagogical competence of teachers by improving their skills in developing interactive courses, using digital tools for knowledge visualisation, organising a facilitative educational environment, and through active participation in professional communities is a reasonable direction. Systemic support should include the creation of local resource centres with open templates, recommendations for planning blended courses, and examples of effective content integration. Particular attention should be paid to developing the analytical component of blended learning, including feedback, reflection, and comparative

analysis of results, which allows to assess performance and adjust the educational process by the dynamics of each student's development. Thus, recommendations for improving blended learning should focus on building an open, adaptive and integrated model that provides conditions for forming holistic professional thinking in design.

### Conclusions

The study found that blended learning is an effective tool for flexible organisation of the educational process and a powerful means of forming the interdisciplinary competence of future graphic designers. Its potential lies in combining digital and traditional forms of learning that can ensure the integration of knowledge from related fields, the development of creative and analytical thinking, visual literacy, teamwork and adaptation to the dynamic challenges of the professional environment. It is determined that the leading role in this process is played by methodological approaches, including project-based learning, case analysis, portfolios, facilitation, and scenario modelling, which in a blended format allow for the gradual integration of knowledge, skills, and social skills.

Several systemic problems have been identified that hinder the effective implementation of blended learning: infrastructure barriers (technical instability, resource insufficiency), personnel barriers (limited digital competence of teachers), and didactic challenges (fragmentation of teaching materials and lack of integrity of interdisciplinary courses). These problems necessitate revising approaches to curriculum planning, particularly their structure, the logic of integration of disciplines and the role of digital tools in forming integrated design solutions. The authors propose the introduction of adaptive modular courses based on the principle of a mixed format, taking into account the type of design and level of training of students, the active use of interdisciplinary simulation projects, the development of digital pedagogy, and the creation of local hubs with open educational resources. A promising area for further research is the development of models for assessing interdisciplinary competence in a hybrid educational environment and studying the role of emotional, cognitive, and cultural components in ensuring the sustainability of interdisciplinary interaction.

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