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PEDAGOGICAL FEATURES OF TRAINING GRAPHIC DESIGN BACHELORS FOR PROFESSIONAL ACTIVITY IN THE DIGITAL AGE

Abstract. The present article examines pedagogical changes in the system of training bachelor's degree students in graphic design against the backdrop of rapid digitalisation. Based on an analysis of latest international research and educational practices, the paper identifies key trends in curriculum development, teaching methods, technological integration, interdisciplinary approaches, and collaboration with stakeholders. The methodology is founded upon a qualitative analysis of recent research, comparative educational practices, and specific examples drawn from the experience of professional educational institutions. The findings demonstrate that contemporary graphic design education is shifting toward a hybrid model that combines digital competencies, creative thinking, and collaborative skills. However, significant challenges remain, including outdated curricula, insufficient integration with industry, and the underdevelopment of soft skills.

The paper also proposes a set of pedagogical recommendations, including the integration of artificial intelligence into curricula, the expansion of interdisciplinary learning, and developing flexible, personalised educational pathways.

Keywords: bachelor-level graphic designers, graphic design education, digital technologies in education, professional competencies, curriculum development, artificial intelligence, interdisciplinary learning, EdTech.

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ПЕДАГОГІЧНІ ОСОБЛИВОСТІ ПІДГОТОВКИ БАКАЛАВРІВ З ГРАФІЧНОГО ДИЗАЙНУ ДО ПРОФЕСІЙНОЇ ДІЯЛЬНОСТІ У ЦИФРОВУ ЕПОХУ

Анотація. У цій статті розглядаються педагогічні зміни в системі підготовки бакалаврів з графічного дизайну в умовах стрімкої цифровізації. На основі аналізу останніх міжнародних досліджень та освітніх практик у статті визначено провідні тенденції у розробці навчальних програм, методиках викладання, інтеграції технологій, міждисциплінарних підходах та співробітництва із стейкхолдерами. Методологія базується на порівняльному аналізі освітніх практик та окремих прикладах із досвіду фахових закладів освіти. Результати показують, що сучасна освіта у сфері графічного дизайну переходить до гібридної моделі, яка поєднує цифрові компетенції, креативне мислення та навички співробітництва. Все-таки залишаються помітні виклики, зокрема застарілі навчальні програми, обмежена інтеграція з індустрією та недостатній розвиток м'яких навичок.

У статті також пропонується низка педагогічних рекомендацій, зокрема впровадження штучного інтелекту в навчальні програми, розширення міждисциплінарного навчання, розробка гнучких і персоналізованих освітніх траєкторій та ін.

Ключові слова: бакалаври з графічного дизайну, освіта у сфері графічного дизайну, цифрові технології в освіті, професійні компетентності, розробка освітніх програм, штучний інтелект, міждисциплінарне навчання, EdTech.

Statement of the research problem. The rapid digital transformation of contemporary society has significantly reshaped the professional landscape of graphic design, requiring a reconsideration of traditional approaches to undergraduate education in this field. Graphic design is no longer limited to print-based visual communication but increasingly encompasses digital media,

interactive systems, user experience design, and data visualization. As a result, the competencies required of graduates have expanded to include not only artistic creativity but also technological literacy, interdisciplinary thinking, and the ability to collaborate effectively in complex professional environments. This shift places higher demands on higher education institutions, which must adapt their curricula, teaching methods, and training models to meet the evolving expectations of the digital economy.

Despite advancements in modern graphic design teaching, a persistent gap still remains between educational outcomes and industry requirements, particularly in terms of practical experience, soft skills development, and the ability to apply knowledge in real-world contexts. Furthermore, academics frequently investigate generic methodologies and approaches to graphic design instruction. Specialised studies focusing on specific degrees of education are rare.

It is worth noting, that we use the term «pedagogical features of training» to refer to the characteristics of the educational process that determine how teaching is organised, delivered and assessed. These characteristics take into account educational objectives, the age-related characteristics of learners, the content of the teaching and the conditions under which it takes place.

Analysis of recent research and publications. Contemporary research shows that graphic design bachelor's degree training is undergoing a significant transformation due to digitalisation, technological innovation and changing labour market demands. Scholars emphasise the need to revise pedagogical approaches, curriculum content and instructional methods to develop professional and digital competencies that are relevant in the digital age [Huang, Xu, 2024]. –

Several studies focus on integrating digital technologies and innovative teaching methods into art and design education. For example, Huang and Xu (2024) highlight new pedagogical strategies that promote interactive, technology-enhanced learning environments, emphasising the role of digital tools in fostering creativity and learner engagement [Huang, Xu, 2024]. Similarly, Qiu Yajin (2024) examines how to optimise visual communication design curricula, stressing the importance of updating educational content in response to digital transformation [Qiu, 2024, p. 45–50]. Osadcha et al. (2021) contribute further to this discussion by analysing blended learning practices in digital drawing and painting and demonstrating their effectiveness in combining theoretical instruction with practical skill development [Osadcha et al., 2021, 141–147].

Another important research direction addresses the alignment of graphic design education with professional practice and industry needs. Poon (2021) analyses stakeholders' perceptions of graphic design education in China, revealing a growing demand for practice-oriented training and the development of market-relevant competencies. Wang (2024) explores the integration of industry and education in higher vocational graphic design programmes, emphasising collaboration with professional environments as a key pedagogical condition. Xue (2021) identifies common challenges in teaching art and design courses in higher education,

proposing pedagogical countermeasures to improve instructional quality and learning outcomes [Xue, 2021, p. 205–206].

Considerable attention is also paid to the impact of emerging digital technologies on the role of graphic designers. Hwang and Wu (2025) examine graphic design education in the era of text-to-image generation and observe a transition from conventional design methods to content creation and digital authorship. This transformation requires the development of new competencies and the adoption of innovative pedagogical models that promote adaptability and creative autonomy [Hwang, Wu, 2025, p. 239–253].

Institutional and international perspectives provide an additional framework for understanding contemporary trends in graphic design education. The educational philosophies and programme objectives of leading institutions, such as the Department of Graphic Communication at National Taiwan Normal University and the School of Design at The Hong Kong Polytechnic University, emphasise interdisciplinary learning, digital literacy and global competitiveness [Department of Graphic Communication NTNU, 2023; The Hong Kong Polytechnic University School of Design, 2023]. At the policy level, the OECD's Future of Education and Skills 2030 initiative highlights key competencies such as creativity, adaptability and lifelong learning that are directly relevant to preparing graphic design graduates for the digital age [OECD, 2019].

Recent analytical studies of educational and professional programmes further support the need for systematic curriculum development. Tsidilo (2025) provides a detailed analysis of a Bachelor's degree programme in Graphic Design, emphasising the importance of aligning learning outcomes, teaching methods and assessment strategies with contemporary educational and professional standards [Tsidilo, 2025, p. 19–37]. Farms (2023) offers a comprehensive theoretical and practical perspective on design education, highlighting the pedagogical principles that underpin effective teaching and curriculum design in creative disciplines [Faerm, 2023].

A comprehensive review of the extant literature indicates that the pedagogical features of training graphic design undergraduates in the digital age are characterised by digitalisation.

The purpose of the study. A review of contemporary research indicates that scholars have extensively examined various aspects of graphic design education in the digital age. These aspects include the integration of digital technologies, curriculum modernization, competency-based and practice-oriented approaches, and the influence of emerging technologies on the professional role of designers [Huang, Xu, 2024; Qiu, 2024; Hwang, Wu, 2025]. It is evident from a perusal of institutional and international documents that adaptability, creativity and lifelong learning are considered to be pivotal outcomes of higher education in creative fields [OECD, 2019; Department of Graphic Communication, NTNU, 2023]. Concurrently, despite the substantial number of studies addressing digital transformation in design education, the extant literature lacks a systematic pedagogical analysis of

the specific features of training graphic design bachelors for professional activity. In particular, insufficient attention has been paid to the comprehensive identification and structuring of pedagogical features that integrate goals, content, teaching methods, forms of organisation, and digital learning environments within bachelor-level training programs.

Therefore, the reviewed studies indicate a research gap related to the necessity of a holistic pedagogical interpretation of training graphic design bachelors in the digital age. The objective of this study is to identify and substantiate the pedagogical features of training graphic design bachelors for professional activity in the digital age. In order to achieve this, contemporary educational approaches, digital technologies, and international trends in higher education will be taken into account.

Presentation of the main content. In the current digital era, the training of undergraduate graphic design students presents new pedagogical features in many areas. This section will review and analyse them in six areas: the curriculum, teaching methods, technological tools, interdisciplinary integration, industrial collaboration, and the practical training mechanism. Specific data and case studies will be used to illustrate these areas.

1. Curriculum

In terms of curriculum development, universities and colleges have increasingly begun to update and expand traditional graphic design programmes in response to digital transformation. Whereas earlier curricula primarily emphasized static graphic disciplines such as plane composition, colour composition, layout design, and printing processes, contemporary undergraduate programmes more frequently incorporate courses related to digital media and interactive design. In particular, many institutions have introduced senior-level modules in UI/UX design, moving image and motion graphics, information visualization, and web and mobile interface design, aiming to enhance students' ability to communicate visually in screen-based environments. This curricular shift reflects the growing demand of the design industry for multimedia-oriented professionals.

In China, for example, Jiangnan University and Nanjing Arts Institute have identified digital media design and interaction design as key directions within graphic design programmes, emphasizing students' adaptability to emerging media. In addition, some universities have introduced course modules or elective units under the framework of «Artificial Intelligence + Design,» reflecting the integration of advanced technologies into design education [Xue, 2021]. According to Qiu Yajin (2024), curricula oriented toward the needs of a digital society should incorporate new media technologies and advanced design tools in order to stimulate students' creativity and enhance teaching effectiveness. Consequently, many institutions have added interdisciplinary courses such as user experience research, service design, and fundamentals of design and programming, thereby providing students with new knowledge structures required in the digital age.

Similarly, the undergraduate curriculum of the Department of Graphic Communication at National Taiwan Normal University has undergone continuous

innovation and adjustment in recent years and now encompasses a wide range of fields, including graphic design, film production, printing technology, information technology, and marketing strategy [Department of Graphic Communication, 2023]. Such curriculum diversification ensures that students acquire not only traditional graphic design skills but also competencies related to digital content production and dissemination.

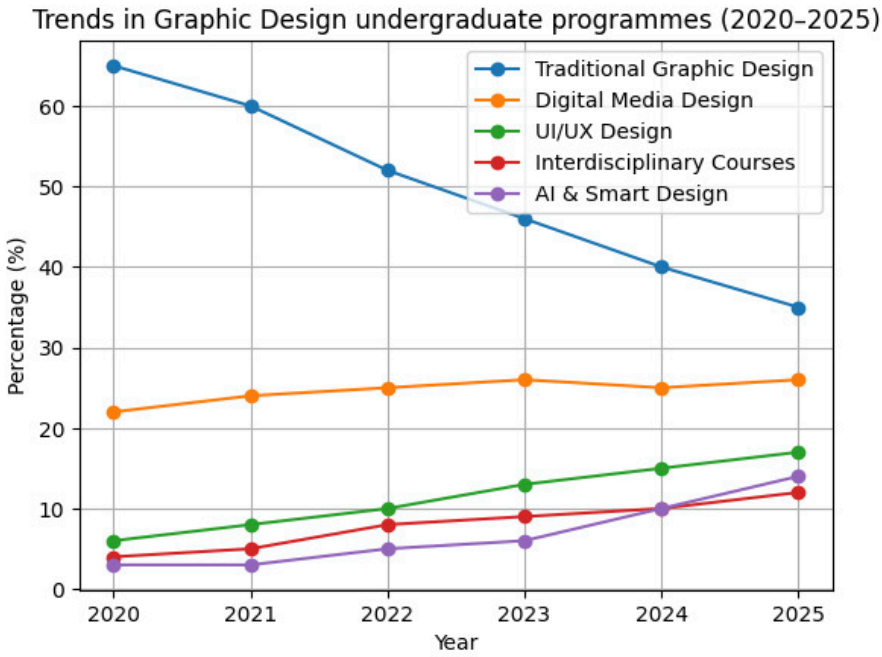

Figure 1: Trends in the development of undergraduate degree programmes in Graphic Design (2020–2025)

* constructed by the authors

There is an increasing emphasis on modularity and flexibility in curriculum structures, enabling the rapid integration of cutting-edge content. The traditional «one-size-fits-all» model of training is gradually being replaced by modular curriculum frameworks that allow higher education institutions to adapt elective components in response to technological advancements. For instance, some universities offer elective workshops such as *Design and Artificial Intelligence* and *XR (Extended Reality) Design* for senior students, ensuring that course content remains aligned with emerging industry trends.

In addition, many universities have implemented industry–academia collaborative courses in which academic instructors and industry professionals jointly supervise students working on real-world projects. Within such programmes, current industry needs and practical case studies are incorporated into the educational process, allowing students to acquire hands-on experience through project-based learning.

For example, partnerships between universities and technology companies have resulted in courses such as Digital Branding Design, where student teams develop cross-media brand promotion strategies under the dual guidance of faculty members and corporate mentors.

This type of curricular innovation provides students with opportunities to apply digital technologies to authentic design tasks during their studies, thereby strengthening the integration of theory and practice. Overall, undergraduate graphic design programmes in the digital era are transitioning from a predominantly static, single-track design education model toward a multidimensional approach focused on the development of digital creativity. This transition is characterized by enriched course content, accelerated curriculum renewal, and closer alignment with the dynamics of industry development.

2. Teaching methods

The change of teaching methods is another major feature of graphic design talent training in the digital context. Compared with the one-way teaching based on classroom lectures and homework exercises in the past, more colleges and universities are now adopting a diversified teaching mode that is student-centered and combines digital technology. New methods such as flipped classroom, project system and interdisciplinary team teaching have become the mainstream trend.

Teacher (lecturers) divide the course content into a number of integrated projects, allowing students to work in groups to carry out research, creativity and design practice around real topics. In the course of the project, students need to apply what they have learnt to solve interdisciplinary problems and develop teamwork and project management skills. For example, in the course «Brand Design», the teacher may ask students to design a complete brand image for a startup company, from logo to app interface, which requires the integrated application of visual design, user experience, marketing and other knowledge. Project teaching brings the learning process closer to the actual work situation, and the participation of enterprise staff and experts in teaching and assessment significantly increases students' participation and motivation.

Flipped classroom and online/offline hybrid teaching are fully applied in the design programme. Theoretical knowledge points are made available to students for self-study through pre-recorded videos or online resources, while valuable classroom time is used for discussion, Q&A and practical guidance. Especially in the teaching of software skills, many institutions use digital teaching platforms to release teaching videos and practice materials, so that students can learn the operation of Photoshop, Illustrator and other tools at their own pace, and teachers in the classroom provide face-to-face counselling for difficult points. Such a mode improves teaching efficiency and develops students' independent learning ability. Furthermore, practical teaching forms such as interdisciplinary workshops and Design Hackathon are flourishing. Students from other disciplines, such as computer science and business, are often invited to work together with design students to complete an innovative project in a short-term workshop. This kind of

cross-disciplinary collaborative teaching develops students' ability to think from multiple perspectives and rapid prototyping, as well as their skills in communicating and collaborating with team members from different backgrounds.

The role of the teacher is also changing, from knowledge transmitter to mentor and guide. In open-ended projects and discussions, teachers give more heuristic guidance rather than simply providing standard answers. This fosters creative thinking and problem-solving skills among students. Through collaborative teaching, teachers and students interact with each other frequently and discuss together, which significantly improves students' internalization and application of knowledge. In addition, colleges and universities are gradually paying attention to the reform of teaching feedback and evaluation methods. In the past, the evaluation of design courses often only looked at the final work, but now mechanisms such as process evaluation and peer review have been introduced. For instance, students are required to make a proposal report at each stage of the project, receive comments from teachers and classmates, and finally assess the grades by integrating the performance of each link. This evaluation system encourages students to devote themselves to the entire process, making continuous improvements and facilitating the growth of teaching and learning. In summary, teaching methods in the digital age have become more flexible and diverse, emphasising the concept of «learning by doing» to enhance students' ability to adapt to practical work. Undergraduate graphic design education needs to break through the limitations of traditional single-discipline teaching and comprehensively improve talent cultivation quality through interdisciplinary, project-driven integration, collaboration, and other innovative teaching modes.

3. Technical tools

Against the backdrop of rapid digital technological development, undergraduate graphic design education has increasingly been characterized by the extensive application of digital tools. Whereas design instruction previously relied primarily on hand drawing, traditional art materials, and a limited range of graphic software, contemporary graphic design education requires students to achieve proficiency in a wide variety of digital design platforms as a fundamental professional skill. Software such as Adobe Creative Suite (Photoshop, Illustrator, InDesign), Sketch, and Figma is now widely integrated into classroom instruction and the completion of academic assignments.

In professional graphic design practice, a competent digital designer is expected to master tools such as the Adobe Creative Cloud suite, Sketch, and Figma in order to produce visual design concepts, develop interactive prototypes, and refine user interfaces that effectively respond to client requirements and enhance user experience. Accordingly, higher education institutions typically offer foundational courses, such as Computer-Aided Design, in the early stages of undergraduate programmes to ensure that students systematically acquire operational knowledge of essential design software.

Moreover, many coursework assignments require the submission of digital design outputs, including logo creation in Illustrator and the development of application interface prototypes using Adobe XD or Figma. Such tasks are designed to ensure that students attain a high level of proficiency in applying digital tools across multiple stages of the design process, thereby reinforcing the integration of technical skills with professional design workflows.

Table 1.

Detailed software usage in teaching Design (2025)

Software	Usage Rate (%)	Main Purpose	Typical Courses
Photoshop	98	Image editing, digital painting	Visual Communication Design
Illustrator	95	Vector graphics, logo design	Logo & Brand Identity Design
Figma	70	UI/UX prototyping, web layout	Interaction Design
Sketch	45	Interface design (Mac-oriented)	UI System Design
After Effects	55	Motion graphics, visual effects	Dynamic Media Design
Premiere Pro	48	Video editing and composition	Video Production
Midjourney	22	AI-assisted concept generation	AI Design Experimentation
Blender	30	3D modeling and animation	3D Foundation
Cinema 4D	28	Advanced 3D motion graphics	Motion Graphics
Unity	25	Game design and real-time rendering	Interactive Media Design

* Constructed by the author based on OESD Future of Education and Skills 2030 [OECD, 2019]

In addition to graphic design software, other digital media tools are gradually entering the classroom. For example, 3D modelling and animation software (e.g. Blender, Maya, Cinema 4D) is used for basic 3D design teaching; video editing and special effects software (Premiere, After Effects) is used in motion graphics and

film and television advertising courses; programming tools (e.g. Processing, HTML/CSS/JS, Unity) are being introduced for teaching related to information visualization and interaction design to develop students' ability to understand and apply data and algorithms. Especially in the field of user experience (UX), prototyping tools like Axure and user research tools like Eye Tracking are also beginning to be adopted by teachers and students to help them evaluate design effects more scientifically. In terms of hardware, many design schools have set up digital labs or makerspaces equipped with 3D printers, laser cutters, VR/AR equipment, etc. to enable students to transform digital models into physical prototypes or test interaction designs in virtual environments. These facilities have been put in place to provide an environment for students to practice the latest technology.

In the last two years, cutting-edge technologies such as generative AI have also attracted attention and experimentation in the field of design education. For example, some classes allow students to use AI drawing tools such as Midjourney and DALL-E to develop conceptual ideas and experience how new technologies can assist and expand the creative process. Although the introduction of AI tools is still in the exploratory stage, research shows that future designers need to have AI creative literacy and know how to enhance creative expression with the help of artificial intelligence. As a result, some colleges and universities are already discussing how to incorporate new content such as Prompt Engineering (cue word engineering) into their teaching in order to keep students abreast of technological evolution. Overall, today's undergraduate graphic design programmes place an unprecedented emphasis on technological tools, requiring a broad software skillset and encouraging experimentation with emerging technologies. This embrace of new technologies and techniques allows students to graduate with proficiency in the industry's common tools and the ability to adapt and learn from the new tools that are constantly emerging, thus shortening the break-in period after entering the workforce.

4. Interdisciplinary integration

The complexity of the digital economy era makes graphic design no longer an isolated subject area, and interdisciplinary integration has become one of the important features of undergraduate design talent training. While traditional design education mainly revolves around art and design ontology knowledge, colleges and universities are now placing more and more emphasis on the integration of design with technology, computers, psychology, humanities, sociology, marketing and other fields, in order to cultivate students' comprehensive and innovative abilities. In terms of curriculum, this is reflected in the introduction of more interdisciplinary courses and the provision of free elective channels. Tsinghua University Academy of Art and Design and other universities have opened cross-disciplinary courses such as «information art» and «data art» to cultivate designers with the composite ability of «art + science and technology» [Huang & Xu, 2024]. Many colleges and universities allow visual communication design students to study in the field of information art and data art. Many colleges and universities allow students majoring in visual communication design to minor in computer science, marketing and other

second majors, or offer cross-disciplinary courses such as «design and sociology» and «art and science and technology» in the general education stage, so that students can understand the way of thinking in different fields. Students can take courses such as Introduction to Programming, Psychology, and Business Planning to lay the foundation for future careers in UI design, service design, and other jobs that require cross-border thinking.

Interdisciplinary collaboration is also becoming more common in project teaching and research training. Many design schools hold joint innovation and entrepreneurship projects or service design workshops with schools of computer science and business, where student teams are composed of members from different disciplines, solving practical problems by colliding multidisciplinary knowledge. For example, one university conducted a project on «Visualization and Design of Medical Information», inviting medical students and design students to work together to design an easier-to-use interface for medical information systems. In the process, design students learnt scientific methodologies from other fields, while students with non-design backgrounds also experienced the value of design thinking. This cross-disciplinary training enhances the students' ability to solve complex problems and meets the current industry demand for people with «T-shaped» knowledge structures. Traditional teaching is often limited to a single discipline, so that students lack a comprehensive vision, but through the integration and application of cross-disciplinary knowledge, to ensure that students get a more comprehensive education. To this end, some universities have also promoted the model of interdisciplinary team teaching by teachers, such as the «Interactive Information Design» course jointly offered by graphic design teachers and computer science teachers, which provides guidance to students from both the aesthetic and technical perspectives. This pedagogical innovation ensures the professional depth and breadth of course content.

It is worth mentioning that China's recent promotion of the «new liberal arts» has also encouraged the cross-border integration of design disciplines. Design professional institutions have responded positively, exploring ways to integrate artificial intelligence and big data into design teaching. For instance, a College of Fine Arts has introduced a program in «data art» to nurture design talent with an understanding of data analysis and aesthetic sensibility. Another example is the The Academy of Fine Arts at Tsinghua University collaborates with the engineering departments to offer a multidisciplinary programme in information art and design. Students on this programme study programming, interactive technology, and visual design. Such initiatives demonstrate that design education is breaking through traditional boundaries and becoming deeply integrated with other disciplines. Through interdisciplinary training, graduates are better able to synthesise multidisciplinary knowledge and innovate when faced with complex design topics in the real world, such as smart city design and interactive information systems. This mode of training is also seen as a future development trend: design as a link

between art, technology, and society, cultivating a new generation of digital and information talent.

5. Industry cooperation.

To narrow the gap between school training and industry needs, undergraduate graphic design education has strengthened its collaboration with industry in recent years. Important forms of industry collaboration include school-enterprise co-construction of studios, enterprise mentorship and participation in graduation design assessment. Industry collaboration is reflected in the following areas:

First, deepening the mechanism of university-enterprise cooperation. Many colleges and universities have established long-term partnerships with well-known design companies and Internet enterprises to jointly formulate talent training programmes, develop courses and provide internship opportunities. For example, some colleges and universities have cooperated with Tencent, Alibaba and other companies to open «Industry-University Cooperation Collaborative Educational Programme», in which the enterprises participate in the co-construction of the curriculum, provide real design propositions for students to practice, and give professional feedback on students› works. Some partner companies also send senior designers as guest lecturers or part-time tutors to hold regular lectures and workshops for students, bringing the latest cases and experiences from the industry to the campus. This university-enterprise co-construction model keeps the course content up to date with industry dynamics, and students have the opportunity to be exposed to cutting-edge industry information and real project needs, which enhances their practical ability and professional awareness [Qiu, 2024].

Table 2:

University-Industry Cooperation Statistics (2025)

University	Joint Courses	Internship Bases	Industry Mentors	Competitions Hosted	Collaborative Projects
Zhejiang University	6	8	12	2	5
Tongji University	3	5	6	1	2
China Academy of Art	4	3	8	2	4
Central Academy of Fine Arts	5	6	10	3	6

Secondly, studio-based teaching is implemented to simulate the industrial environment. The design schools of many universities have established on-campus design studios or innovation centers, which operate like design companies. Senior students can undertake on- and off-campus design projects under the guidance of their mentors to experience the actual workflow and teamwork. Some of these studios are connected to the orders of alumni start-ups, while others are involved in

social welfare design projects, in which students hone their skills and accumulate their works in practice. Although the implementation of the studio system in colleges and universities is conducive to the integration of industry and education, there is still the problem of insufficient depth in the implementation process of some schools, which needs to be further improved. Can be built through the construction of graphic design professional studio, to create a combination of full-time and part-time teachers team to guide the actual project, through the school to create a «small design company» environment, so that students will be familiar with the industry's mode of operation earlier.

Thirdly, it attaches importance to the institutionalization of internship practice sessions. Many colleges and universities make corporate internships a compulsory part of undergraduates, usually arranged in the junior or senior year, lasting from a few weeks to a few months. Students enter design companies, advertising and media organizations or internet companies for internships, exercising their professional skills and communication abilities in a real workplace environment. This not only allows students to learn about industry norms and teamwork, but also lays the foundation for their successful employment after graduation. Some schools build internship bases or joint training bases with enterprises, sending students to internships and receiving guidance from enterprise mentors. For example, a university has signed a contract with a number of local design companies to establish internship bases, arranging for dozens of students to go to rotational training each year, while enterprises select the best from them to recruit in advance, achieving a «win-win» situation. During the internship process, the school and the enterprise keep in touch, and both sides assess the performance of the students to ensure that the internship meets the training objectives.

In addition, industry interface is also reflected in inviting the industry to participate in graduation design assessment and professional construction. Many colleges and universities will invite creative directors and senior designers of famous design companies to participate in the graduation work exhibition jury and directly give opinions on graduates' works, which prompts students to polish their portfolios in accordance with industry standards. There are also colleges and universities that hire business experts to participate in the steering committee for professional construction, regularly discussing whether the curriculum is in line with the industry's development and making timely adjustments based on the suggestions. Overall, strengthening industry docking has injected realistic vitality into undergraduate talent cultivation, so that teaching activities are no longer closed to the classroom, but open to the real world. By building a new bridge of school-enterprise cooperation through the integration of industry and education, it can share quality resources, improve the curriculum system, and build a collaborative education model, thus improving the quality of talent training and achieving a win-win situation for both schools and enterprises. At present, although there is still room for improvement in the depth and mechanism of cooperation, both universities and industries have

recognized the importance of co-parenting and are working towards closer and institutionalized university-industry cooperation.

6. Mechanisms for practical training

In the digital era, the practical training mechanisms for undergraduate graphic design programs have become increasingly diversified and sophisticated.

On the one hand, the proportion of practical components within courses has significantly increased. Many courses now incorporate practical assignments or laboratory sessions alongside theoretical instruction. For example, in addition to lectures on layout design principles, students are required to complete multiple layout projects in computer laboratories. Similarly, advertising design courses often involve participation in on-campus printing and publishing laboratories, where students engage directly in the production of sample magazines. In line with the requirement regarding the proportion of practical teaching credits advocated by the Ministry of Education in recent years, many design programs have increased practical credits to more than 30% of the total. This implies that students spend nearly one-third of their academic time on computer-based work, workshop activities, and project-based practice. Such an approach ensures the development of hands-on skills and mitigates the limitations of purely theoretical learning.

On the other hand, extracurricular activities and competition-based practice have become important supplements to formal practical training. Higher education institutions actively organize and encourage student participation in design competitions, creative exhibitions, and social practice initiatives. For instance, a large number of students take part annually in national-level competitions such as the National Advertising Art Competition for College Students and the National Packaging Design Competition. Institutions typically provide guidance and incentives for participants and recognize these activities as components of practical training. Through such competitions, students enhance their creative output and ability to perform under pressure in real-world scenarios, while outstanding works contribute positively to their employment prospects.

In addition, institutional support for student organizations and on-campus design services constitutes another important aspect of the practical training mechanism. Many universities host student design clubs that undertake projects such as poster design and event branding, or organize collaborative activities like design marathons, where students from different academic levels work together on thematic projects. These forms of practice not only enrich the learning experience but also foster initiative and leadership skills.

At the institutional level, the graduation project (thesis) is regarded as a key component for assessing students' comprehensive practical abilities. Universities generally require final-year students to complete a full design project encompassing research, planning, design, and presentation. In some cases, topics must be aligned with real-world problems or industry-based briefs, and the process is subject to staged evaluation and final defense. This process effectively functions as a long-term practical training program aimed at evaluating students' ability to integrate

and apply acquired knowledge. In recent years, some institutions have explored integrating graduation projects with entrepreneurial incubation, supporting students in transforming outstanding projects into startup initiatives that can be further developed within incubator programs. This «integration of graduation design and entrepreneurship» reflects ongoing innovation in practical training mechanisms.

Finally, the professional background of teaching staff is crucial to the effectiveness of practical training. Many universities have emphasized the development of «dual-qualified» teaching teams, comprising educators who possess both strong academic foundations and relevant industry experience. Institutions enhance practical training by inviting industry professionals as mentors and encouraging faculty members to engage in enterprise-based practice. Through sharing real project experience, teachers guide students in avoiding common mistakes and adhering to professional standards, thereby significantly improving the quality of practical training.

Overall, the practical training mechanism in undergraduate graphic design education is evolving toward greater systematization, diversification, and alignment with real-world practice. From classroom-based training to on- and off-campus projects, and from graduation design to faculty support, these interconnected components provide students with continuous opportunities for practice and refinement. As a result, graduates possess a solid foundation of practical skills and professional competence, enabling them to adapt more effectively to the demands of the digital design industry.

Conclusions and prospects of further studies. The study demonstrates that graphic design training in the digital age should focus on developing an integrated set of competencies that combines artistic and aesthetic foundations with digital and technological proficiency as well as communication and collaborative skills. This «three-dimensional integration» ensures that design solutions are both creatively original and practically applicable in contemporary professional contexts.

Current trends indicate a shift towards greater integration, flexibility and openness in design education. In particular, the growing importance of emerging technologies (e.g. artificial intelligence, AR/VR and data-driven tools) means they must be systematically incorporated into curricula, while maintaining a strong focus on creativity and humanistic values to avoid purely technological approaches becoming dominant.

The future development of graphic design education is closely linked to: (1) strengthening sustainable industry–academia collaboration through jointly developed standards and practice-oriented learning; (2) expanding the interdisciplinary and international dimensions of training to enhance students' adaptability in a globalised environment; and (3) implementing student-centred, lifelong learning models supported by digital educational technologies.

Further research prospects include empirically assessing the effectiveness of technology-integrated curricula, developing models for sustainable cooperation between higher education institutions and stakeholders, and exploring pedagogical

strategies for balancing technological competence with creative thinking in the context of rapid digital transformation.

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