

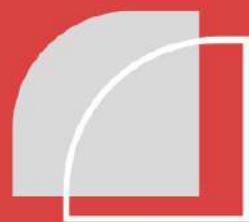


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The system of continuous design education in Ukraine in the context of higher education modernization



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Abstract Continuous education is characterized by a constantly evolving complex of innovative pedagogical knowledge presented in the context of modernizing higher education in Ukraine. It has determined the relevance of the proposed research. The article aims to establish the effectiveness of introducing a range of educational components of continuous design education into pedagogical courses, perceived as innovations in education, to identify the problems of motivation and integration of the idea of continuous design education into the professional activities of educators. Several planning aspects of education modernization have been identified (attitude of educators towards innovation, anxious use of innovation in design education, external difficulties in introducing innovation in continuous education, innovative pedagogical practices, and readiness for modernization of design education in the higher education space). The study conducted comprehensive research, applying the method of pedagogical experiment. Surveys, observation, and experimental methods were used to diagnose the effectiveness of modernizing design education among educators in this field. The central hypothesis is that continuous courses in design education and self-education activities related to innovations in university education actively contribute to the popularization of continuous education in creative sectors of the national economy and anticipate their integration into the teaching activities of higher education staff. This research proves that programs of continuous training of specialists in design education and educational courses associated with innovation are effective and make it possible to use innovation in their professional practice. Further perspective is to investigate the development of continuous education in the territory of Ukrainian higher education.

Keywords: education modernization, continuous design education, Ukraine, higher education

1. Introduction

Innovative pedagogical knowledge is vital in providing employees with more effective work. Therefore, since the beginning of Ukraine's independence, the government has also focused on developing continuing education and establishing a national design system (Cabinet of Ministers of Ukraine Resolution No. 37 "On Priority Measures for the Development of the National Design and Ergonomics System and the Implementation of Their Achievements in the Industrial Complex, Residential, Production, and Socio-Cultural Spheres" dated January 20, 1997).

In 2018, the Ukrainian government approved and implemented the first (bachelor's) level of higher education standards in the field of knowledge 02 "Culture and Arts" for the specialty 022 "Design" (Ministry of Education Order No. 1391 dated December 13 2018). Professional training of design specialists is constantly being implemented in artistic, technical, and technological educational institutions in Ukraine. University education is no exception, where design education plays an important role (Prusak 2017). It involves continuous development and implementation of nonverbal thinking and communication skills, the ability to solve non-standard problems, and coping with crisis situations (Norman 2016). The function of the continuous design education system in Ukraine is associated with the development of human abilities, creative and innovative skills. A series of educational programs for different levels of education have been developed in the educational space of Ukraine. The subject "Design and Technologies" (New Ukrainian School grades 5-6) is included in the model educational programs. At the higher education level, an elective disciplinary course, "STEM," is also introduced, which involves project activities and the development of competencies necessary to implement design ideas using decorative and applied arts



and design technologies. All this indicates an intention to create a harmonious system of continuous design education for the youth of Ukraine.

Today's international community also pays great attention to ensuring the quality of design education, working on the concept of inclusive and accessible education for everyone. This idea was embodied in the educational program until 2030 (Framework of Education 2030, developed and presented globally in 2015 as 10 goals and effective strategies for further implementation (UNESCO 2015).

It was about the need for socio-economic changes through modernization and a systemic approach to education and innovative educational technologies. It primarily involves implementing continuous changes at all levels of education in response to the situation (Lindblom-Ylänne, et al 2018). It determines the scientific issues of research related to the introduction of continuous design education:

- Studying effective ways of development
- Researching state policy regarding design education
- Modernizing education through the organization of a continuous educational process

The need to develop education has been declared by international organizations (UNESCO 2015). Among the priority areas for improving the system of continuous education is also in the field of design. It also involves introducing new courses designed to master pedagogical innovations in design education, promoting the continuous professional development of educators, and encouraging creativity and the creation of their products (Zhernova 2018).

The introduction of continuous design education requires the teaching staff to use innovative methods constantly. In other words, educators must have adequate knowledge of design and advanced teaching methods in order to use innovations in order to use them in their professional activities (Jayashree 2017).

Continuing design education at the university level aims to train young professionals in demand and competitive labor markets. In addition, continuity provides the ability to adapt to rapidly changing labor market demands due to modern states' technological and social development.

Thus, new demands on the labor market are constantly emerging, new professions are emerging, and the need for others is disappearing. Therefore, organizing a dynamic continuing education system is crucial; it should always be in the state (Oruzha 2018). Further continuous design education must be present in the life of every person. Every Ukrainian citizen should have access to design education and have the opportunity to acquire new skills in different areas, forms, and types of design several times during their lives.

Some researchers explain the effective integration of innovations in design education as a necessity in the conditions set by the 21st century, where one must be prepared to function in civil society, have functional skills, and quickly adapt and master new technologies through knowledge gained in design education, in the field of digital technologies (Partnership for 21st-century learning 2020).

Therefore, an essential task for continuous learning processes in higher education is to support students in obtaining design education through self-organization, support of universities, and improving the quality of university education (Partnership for 21st-century Learning 2020). Furthermore, the continuity of design education is a prerequisite for the ongoing impact on Ukrainian students' personal and professional development throughout their lives.

The study aims to determine the effectiveness of introducing a range of educational components in design education to continuous education courses. Based on this purpose, the following research tasks are planned to be carried out:

- Identify the motivation and integration problems of the idea of continuous design education in the professional activities of teachers;
- Determine the assessment by teachers of innovations in the field of continuous design education and the difficulties associated with it;
- Determine the effectiveness of the main techniques and additional conditions for introducing design education into continuous teacher training courses.

2. Literature Review

Continuous learning is characterized by the necessity of constantly deploying the learning process aimed at generating and structuring new ideas, seeking principles for solving new tasks, analyzing relevant realities, and critically evaluating the results obtained (Loyens et al 2013). Such characteristics make up the prospects for research and the development of methods for implementing continuous design education (Brovchenko 2022).

The proposed research is a sequential introduction of the experience of implementing previous experiments that focused on the problems of developing continuous design education, exhibition activities, informal education as part of design education (Ivanova et al 2020), peculiarities of introducing innovations and modern pedagogical knowledge into practice (Kiki-Papadakis and Chaimala 2016). Similar investigations explore practical algorithms for introducing universal design education technologies into higher education (Puranik 2020), introducing research programs of a non-discriminatory nature, socio-cultural projects for adapting educators to the introduction of innovations, removing psychological and cultural barriers to the

space of continuous education (Boghian 2019); considering the organization and regulation of continuous educational processes at all levels of education (Senthilkumar and Kannappa 2017).

In a series of studies, continuous design education is presented as a series of stages (phases) of self-regulated learning (conception of ideas, formation of a plan, project creation, and project correction). People ready for continuous design education at the higher education level are presented as those who can set their own goals and tasks, take responsibility for learning, and formulate and maintain motivation. Self-regulation as an important part of design education has been studied in many types of research dedicated to the problem of developing cognitive and creative strategies, self-control, and correction of personality's learning strategies (Heikkilä, Lonka, Citation 2012). The self-regulated learning components were identified (Geitz and Geus 2019). The authors determined conditions for the successful implementation of continuous design education from the perspective of successful experience in European countries (Hattie and Donoghue 2016). Also, the means of developing and adapting design education methods in Ukraine were considered (Oruzha 2018).

3. Materials and Methods

The authors of this research carried out a pedagogical experiment in combination with several research approaches and methods to effectively address the problems of introducing continuous design education in Ukraine. The descriptive method, analysis, and synthesis were used to describe and analyze theoretical research developments, works from pedagogy theory, philosophy, sociology, and others. Auxiliary survey methods (written form) and observation were used to conduct the experiment. The process of introducing continuous courses in design education described in the study was viewed from the observation perspective. Therefore, this method is empirical and cannot directly determine the experience of introducing innovations as a systemic change. The authors used statistical methods to evaluate the results of the experiment.

The experiment involved participants in continuous qualification courses and training for higher education teachers dedicated to design education and related fields (Lviv National Academy of Arts, Kharkiv State Academy of Design and Arts, Ukraine).

The pedagogical experiment method was applied for one academic semester (6 months) in 2021-2022 (October 2021 - March 2022). The experimental method was used to determine how significant the forecasting features are (the concerns of educators and their readiness to introduce innovations in design education, in particular) and how effective the introduction of innovative educational components in design education and innovations regarding courses for the continuous qualification and training of academic workers are.

The experiment involved a total of 28 participants in training courses and internships. The classes are continuous, meaning they involve simultaneous learning and work. 70% of the courses took place online, and 30% of the study time included the organization of workshops, introductory sessions, and final conferences that took place offline at the universities that founded the program (Lviv National Academy of Arts, Kharkiv State Academy of Design and Arts, Ukraine).

All respondents were divided into two groups, two groups in each institution: 2 experimental groups (EG1 - 14 people and EG2 - 14 people). The variable in the experimental group is the implementation of the new course "Innovations in Design Education" into the approved curricula since 2020.

Stage 1. A survey is conducted among the experiment participants to determine the demographic and qualification characteristics of the respondents, participants of the EG1 and EG2 educational groups in the courses participating in the pedagogical experiment. Educational materials and accompanying audio-video content are prepared, a technological base is created to meet the needs of the course, and preliminary consultations are held with the instructors who will teach this course. The research group has obtained consent from the university administrations to conduct the experiment. All respondents were guaranteed privacy and anonymity during the surveys, questionnaires, and systematization of the research results.

Stage 2. At this stage, simultaneously with the teaching of the course "Innovations in Design Education," surveys are conducted in experimental groups regarding characteristics predicting the future content of the course, the respondents' attitudes toward modernization measures in continuous design education, the level of acceptance of such innovations, their evaluations, and the readiness of university instructors to introduce innovations in design education into their own practical activities.

Stage 3. At the final stage, the results of the initial and follow-up surveys regarding the readiness of industry professionals to implement innovative pedagogical knowledge in design education are summarized and analyzed. In addition, the leading positions of the course evaluation and progress monitoring, if any, are presented.

While conducting this study and during the project implementation process, the research team encountered the following difficulties:

- The need for sufficient time investment (1 semester - 6 months);
- The inability to identify reasons for changes in respondents' evaluations;
- The failure to conduct in-depth qualitative research.

3. Results

The experimental groups in the courses considered a range of innovative teaching strategies of modern pedagogy. Design education is a continuation of project-based learning and competency-based education based on its continuous duration, that is, throughout life. The research group added innovative elements to these two concepts, allowing teachers to develop sustainable educational concepts. The learning environment should stimulate and carry out an effective learning process and enable the achievement of stable goals, creating an ambitious learning climate. Overall, such educational policy encourages the development of the creative potential of learners, offers space for talents, and facilitates the process of profiling. Furthermore, the phenomenon of continuous design education in modern conditions promotes the harmonious combination of formal and non-formal/informal forms of learning.

The course "Innovations in Design Education" presents a range of topics related to the principles of continuous education and the consideration of the latest research in the design field and ways to introduce them from a pedagogical perspective. In addition, detailed explanations and examples of each teaching strategy in action are provided. Above all, design education as a continuous process is presented through seven stages of implementation.

The stages of learning and their project implementation shown in Figure 1 have become leading topics for discussion within the "Innovations in Design Education" course as innovative pedagogical knowledge and means of modernizing higher education in Ukraine.

In the initial stage (Stage 1), a survey was conducted regarding the gender and professional characteristics of the respondents. The questionnaire included age, experience, gender, and educational level.

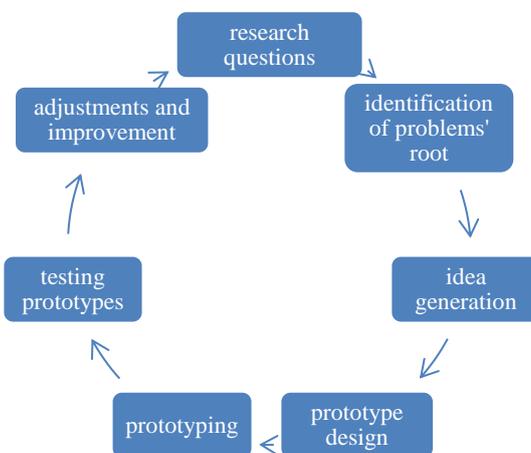


Figure 1 Stages of learning and practical work in design education (author's elaboration).

According to the demographic and gender profile, the gender and age balance of scientific and pedagogical staff (SPS) is generally maintained, with one more male in EG1, but this is not a significant advantage (Table 1). Therefore, the groups are formed so that all age categories are represented in each group, with the majority of respondents being individuals aged 24 to 40 (18 people) and the minority being teachers with work experience in the range of 40-60 years, which is 6 people.

The educational spectrum of the respondents who study in groups is quite broad - it includes 5 Ukrainian universities. And this is understandable since these educational institutions provide training in the field of knowledge 02 "Culture and Art" in the specialty 022 "Design" (from 13.12.2018 No. 1391). The vast majority of teachers in the group are young and have little work experience. Out of 14 participants with extensive work experience (11-20 years, 21 and more), there are 4 people.

Table 1 Demographic and qualification characteristics of the respondents (author's elaboration).

		EG1	EG2
Age	24-40	10	8
	40-60	4	6
Gender	Female	6	7
	Male	8	7
Education background	Lviv National University named after Ivan Franko	2	2
	Lviv National Academy of Arts	2	2
	Precarpathian National University named after Vasyl Stefanyk	3	1
	Zaporizhzhia National University	5	3
	Kharkiv State Academy of Design and Arts	2	6
Work experience	1-3	2	2
	4-10	10	10
	11-20	1	2
	21+	1	0
Total		14	14



In the second stage, in parallel with the introduction of new courses in EG1 and EG2 for all experiment participants in groups, a survey was conducted to show the attitude and evaluation of teachers towards the program characteristics, factors shaping the respondents' attitude towards the introduction of cutting-edge research into design education, and the level of perception and evaluation of innovative pedagogical knowledge in continuous education by industry professionals (Figure 2).



Figure 2 Algorithm of implementation and main characteristics of continuous design education (author's elaboration).

We identified the following algorithms of continuous design education:

- Self-reflection (accumulation of ideas, trial and error through personal experience, brainstorming, etc.);
- Idea formation (idea generation, concept formation, selection of communication channels, analysis of possibilities and ways of implementation);
- Implementation of creative projects (design project formation and implementation, modernization).

It is a system of indicators that demonstrate the algorithm of project activity implementation in design education, the way of accepting and integrating innovations into higher education practice. Accordingly, at Stage 2, during the course study and through surveys conducted among groups of respondents, a preliminary evaluation of innovations in design education, and attitudes towards implementing a continuous design education system that constantly operates, regardless of age and education level, was carried out (Table 2a).

Table 2a The level of perception and evaluation of innovative pedagogical knowledge implementation by preschool educational staff (author's elaboration).

Problematic issue	No	Yes	No	Partly
Is there a need for continuous design education?	EG1	4	2	8
	EG2	3	4	7
Should we integrate design education into teaching practice?	EG1	5	2	7
	EG2	4	1	9
Do you feel the need for design education in your teaching practice?	EG1	4	3	7
	EG2	4	2	8
Are your fears/unwillingness to participate in continuous design education related to internship programs?	EG1	5	4	5
	EG2	4	6	4
Do you have previous experience of participating in innovative activities in the specialty 022 "Design"?	EG1	4	10	
	EG2	6	8	
Do you have a positive feeling about the introduction of continuous design education in Ukraine?	EG1	6	3	5
	EG2	5	4	5
Integration of design education into teaching practice is the responsibility of the institution's administration	EG1	8		6
	EG2	6		8
The attitude towards continuous design education should be changed to a more positive one	EG1	8		6
	EG2	6		8

Overall, the majority of respondents have a positive attitude towards innovation, but only 9 out of 28 are ready to implement it in practice. In addition, 16 people are partially prepared to learn in the continuous design education system. 5 people denied the necessity of continuous design education throughout life.



24 respondents can entirely change their attitude towards implementing new pedagogical knowledge, and 36 can partially change their attitude.

In the final stage (Stage 3), respondents are surveyed to assess their perception of innovative pedagogical knowledge after completing the courses.

At the final stage, in EG1 and EG2, the results with definite answers changed the most - there were fewer of them, and their number decreased to 10%, but in the expert group of 8 people, it decreased to 4. It is because the respondents in the experimental group were ready/partially ready to bring innovations into their own practice after the design education project (a total of 9 people fully and 18 people partly). It is 10% more than the previous survey results (Table 2b).

Table 2b The level of perception and evaluation of innovative pedagogical knowledge implementation by preschool educational staff (author's elaboration).

Problematic issue	№	Yes	No	Partly
Is there a need for continuous design education?	EG1	5	1	8
	EG2	5	2	7
Should we integrate design education into teaching practice?	EG1	5	1	8
	EG2	4	0	10
Do you feel the need for design education in your teaching practice?	EG1	5	1	8
	EG2	4	1	9
Are your fears/unwillingness to participate in continuous design education related to internship programs?	EG1	6	2	6
	EG2	5	3	6
Do you have previous experience of participating in innovative activities in the specialty 022 "Design"?	EG1	4	10	
	EG2	6	8	
Do you have a positive feeling about the introduction of continuous design education in Ukraine?	EG1	6	2	6
	EG2	5	1	8
Integration of design education into teaching practice is the responsibility of the institution's administration	EG1	9		5
	EG2	8		6
The attitude towards continuous design education should be changed to a more positive one	EG1	10		4
	EG2	9		5

Before implementing the innovations, out of 28 teachers, 27 were ready or partially ready at the end of the experiment. As a result, the total number of positively oriented respondents in the experimental group increased by 10% overall.

4. Discussion

Innovative measures that can make education work creative and relevant tasks of the national continuous education design system have been proposed by Brovchenko, A. I. (Brovchenko 2022). First of all, the following system for implementing continuous design education in Ukraine has been defined:

- Design-technological education (primary, pre-profiling, profiling, vocational (professional-technical), advanced education institutions).
- Design-art education.
- Culture-art education with elements of ethnic design (higher education institutions of cultural, artistic, and pedagogical education).
- Production-technological education with ergo-design (higher technological, technical, economic education institutions).

In this study, harmonizing the presented system and constant work on improving the quality of design education is one of the main conditions for developing higher education in Ukraine, which involves the continuous introduction of innovative pedagogical knowledge. In a study on the internationalization process of higher education (Sui 2020), design education has occupied significant positions. An important aspect is the system of promoting an exchange of experience, constant acquisition of new knowledge, and mobility in their transmission. After all, design education is referred to as an activity aimed at improving the quality of higher education. Furthermore, scientific technologies, equipment, and new information are constantly becoming accessible through the openness and continuity of education. Therefore, the world requires opening up the higher education system and constant cooperation with international sources of higher education (Pu, Sui 2016; Dussel 2020). Continuous education is an essential component of modern higher design education. It is a necessary condition for modernizing education, while its integration into the world, accessibility, and openness are relevant. This thesis is confirmed by the results of the presented experiment, where higher education teachers positively responded to the systemic implementation of continuous design education after completing a design education course. In the final stage of learning, 15% more respondents consider continuous design education in Ukraine mandatory, which is perceived as modernizing the higher education space. In the modern world, mastery of technology, creative thinking, and knowledge in the design field are necessary conditions for success in the job market. Therefore, design education has become essential in Ukraine. However, without a constantly updated, modernized system of continuous design education, the development of Ukraine's education industry cannot be achieved.



5. Conclusions

The research model of this study allowed us to determine the prospects of development and difficulties faced in implementing innovations into the continuous design education model in Ukraine. An algorithm for project activities was proposed, leading characteristics of design education were considered, an assessment of the attitude of higher education workers towards innovation, and changes in design education were made. The main tool for such education is a comprehensive design, as it characterizes modern design and involves constant work on improving the complex system of continuous design education. Continuous design education includes elements of preschool, secondary, extracurricular, and vocational education and involves higher and postgraduate education and constant self-education.

In Ukraine, there is a need for further development of software and educational and methodological support for design and technology in higher design education, as well as at the graduate and postgraduate levels. Nevertheless, the study shows that the Ukrainian continuous design education system can function harmoniously with continuous modernization of practical components and theoretical justification. Implementing innovative educational projects in design education for higher education workers permanently through internships and training courses forms comprehensive, innovative pedagogical knowledge. In addition, this experience effectively increases positive assessment of innovations and breaks down negative perceptions of new pedagogical technologies in design education.

The effectiveness of introducing an additional variable (educational disciplines in the experimental group) increased the positive attitude towards innovative pedagogical knowledge on average by 15%. It indicates the need to continue such practices, constantly working on updating the content. The problem of systemic and comprehensive harmonization of the continuous design education model with the realities of the modern world remains open. Therefore, it is necessary to develop further innovative design education projects that will effectively overcome the negative perception of measures to modernize the educational space of higher education in Ukraine.

Ethical considerations

Not applicable

Conflict of Interest

The authors declare no conflicts of interest

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