Project thinking as the basis of professional competence of the designer

El pensamiento del proyecto como base de la competencia profesional del diseñador
Pensamento do projeto como base da competência profissional do designe

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Abstract

Education of our time has shifted from the process of translating knowledge to the formation of the necessary skills and competencies in demand in a modern, ever-changing and uncertain world. Increasingly, we are talking about the need to build teamwork skills, to develop emotional intelligence, to develop critical and creative thinking. The term "project thinking" has attracted attention during the last decade of many researchers. The main idea of project thinking is to solve the tasks set by companies, by researching, prototyping and testing the product. In this article, the authors consider the origins of "Project thinking" in the study of the design environment and its implementation in the teaching process by teachers. Transversal skills such as the ability to think creatively, critical thinking, explore and work in a team are necessary to guarantee a skilled workforce for adaptation in the face of technological progress.

This article shows that it is possible to improve the skills of project-oriented thinking of university design students through carefully designed didactic models and tools, pass on the methodology and train the design-thinking process for application in real business projects, including the practice of empathy, in-depth user research, service design, prototyping new solutions and ideas, as well as their testing.

Resumen

La educación de nuestro tiempo ha cambiado del proceso de traducción del conocimiento a la formación de las habilidades y competencias necesarias en demanda en un mundo moderno, siempre cambiante e incierto. Cada vez más, estamos hablando de la necesidad de desarrollar habilidades de trabajo en equipo, desarrollar inteligencia emocional y desarrollar un pensamiento crítico y creativo. El término "pensamiento de proyecto" ha atraído la atención durante la última década de muchos investigadores. La idea principal del pensamiento del proyecto es resolver las tareas establecidas por las empresas, investigando, creando prototipos y probando el producto. En este artículo, los autores consideran los orígenes del "pensamiento del proyecto" en el estudio del entorno de diseño y su implementación en el proceso de enseñanza por parte de los docentes. Las habilidades transversales, como la capacidad de pensar de manera creativa, pensar críticamente, explorar y trabajar en equipo, son necesarias para garantizar una fuerza laboral capacitada para la adaptación frente al progreso tecnológico.
Este artículo muestra que es posible mejorar las habilidades del pensamiento orientado a proyectos de estudiantes universitarios de diseño a través de modelos y herramientas didácticas cuidadosamente diseñadas, transmitir la metodología y entrenar el proceso de pensamiento de diseño para su aplicación en proyectos comerciales reales, incluida la práctica

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de empatía, investigación profunda del usuario, diseño de servicios, creación de prototipos de nuevas soluciones e ideas, así como sus pruebas.

Palabras claves: Pensamiento del proyecto, práctica, diseño, innovación, competencia profesional.

Resumo

Educação do nosso tempo mudou o processo de traduzir o conhecimento para a formação das habilidades e competências necessárias na demanda em um mundo moderno, em constante mudança e incerto. Cada vez mais, estamos falando sobre a necessidade de desenvolver habilidades de trabalho em equipe, desenvolver a inteligência emocional e desenvolver o pensamento crítico e criativo. O termo "pensamento de projeto" tem atraído atenção durante a última década de muitos pesquisadores. A idéia principal do projeto é pensado para resolver as tarefas definidas pelas empresas, pesquisar, criar protótipos e testar o produto. Neste artigo, os autores consideram as origens do "pensamento projeto" no ambiente de desenho do estudo e implementação no processo de ensino pelos professores. competências transversais, tais como a capacidade de pensar de forma criativa, pensar criticamente, explorar e trabalho em equipe são necessárias para garantir uma força de trabalho qualificada para a adaptação contra o progresso tecnológico.

Este artigo mostra que é possível melhorar as habilidades de design de estudantes universitários orientados para o projeto através de modelos e ferramentas de ensino pensar cuidadosamente concebidos, transmitir a metodologia e treinar o design processo de pensamento para aplicação em projetos comerciais reais, incluindo praticar a empatia, a pesquisa do usuário profundidade, serviços de design, prototipagem de novas soluções e idéias, e seus testes.

Palavras-chave: Pensamento, prática, design, inovação, competência profissional.

Introduction

To be successful in a high-tech world from a person today requires the use of completely different skills and skills than 10-20 years ago. One of these skills is design thinking.

Needs and dissatisfaction with a certain state are indicating the need for any solution to the problem, which in turn is the beginning of the design (Mishina et al, 2016).

Project thinking can have a positive impact on the formation of the XXI century in different disciplines, because it assumes creative thinking in solving certain problems. In the academic environment, students should read, think logically, and, in the process of reasoning, solve complex problems.

Thus, to help students succeed in this competitive, digital world we live in, teachers should support students in developing project thinking, system thinking and instilling teamwork skills that will prepare them for a successful career.

Project thinking also begins to receive increased attention in the business environment. This is due to the fact that the design of products and services is the main component of the business competitiveness.

The purpose of our research is to determine the features and characteristics of project thinking and to show the importance of using this type of thinking in solving the problems posed by design students.

The articles we relied on in our study were selected from available full-text documents using various search terms and key phrases such as project thinking, design knowledge, design behavior, design research, design processes, visual thinking and prototyping.

We limited the search to a specific range and preferred more recent studies. Databases used in the search for articles:

Google Scholar - the website that provides peer-reviewed articles, abstracts, books, abstracts and articles from academic publishers, professional

communities, IEEE Xplore – the database, which provides the full text of articles on computer science, electrical engineering, engineering and electronics, Scientific electronic library eLIBRARY.RU - the largest Russian information and analytical portal in the field of science, technology, medicine and education, containing abstracts and full texts of more than 26 million scientific articles and publications.

Methods

The ability to design activities in the modern era is "a new edge of human education." (McKilligan et al, 2017). Project thinking is based on the belief that we can influence processes, transform complex tasks. It begins with deep sympathy and understanding of the needs and motives of people.

The central idea of project thinking is that we can make all the changes, no matter how big the problem or the problem is, how much time is given for implementation and budget. On the basis of theoretical and empirical research stages, attention must be paid to the methodology of design (object, subject), its development trends, which are shown in a unified nature of publications on issues, lack of attention to them in most periodicals, the number of problems constraining the development of design theory (Akhmetshina et al, 2017). The design process is what conceptual thinking embodies. This is a structured approach to the creation and development of ideas. Project activities develop research skills such as the ability to analyze a problem, raise a problem, gather the necessary information, record and interpret the results, build hypotheses, generalize and draw conclusions.

From our point of view, project competence should be determined by students' readiness for project activities, their individual skills and motivated intention to learn independently, develop a culture of thinking and professional activity (Cross, 2011). Experience in project activities can be acquired in the course of project implementation. The solution of educational and cognitive tasks or situations, the development of project thinking, the analysis of their own projects and participation in exhibitions, competitions contribute to the acquisition of appropriate skills and skills.

Many recent publications of scientists, practitioners and even government organizations

argue that project thinking can stimulate these social competencies and stimulate innovation in organizations and education (Clemente et al, 2016).

In the original interpretation of the study from 1969, the Nobel Prize winner Herbert Simon outlined one of the first formal models of the "Project thinking" process. Simon's model consists of seven main stages, each of which includes the stages and actions of the components, and greatly influenced the formation of some of the most widely used models of design processes. Today, there are many variants of the processes of designing thinking, and, each of them can have a different number of stages, all of them are based on the same principles as in the Simon model of 1969.

We will focus on the five-step model proposed by the Hasso-Plattner Design Institute at Stanford: (Fig.1)

1. Empathise
The first stage of "Project thinking" is an understanding of the problem that you are trying to solve. It includes expert advice to learn more about the area of concern by monitoring, attracting and sympathizing with people.

2. Define
At this stage, you need to analyze your observations and synthesize them to identify the main problems.

3. Ideate
At the third stage of the "Project Thinking" process, designers are ready to start generating ideas. Given specific problems, team members can begin to "think outside the box" to identify new solutions to problems. It is very important to offer as many ideas as possible to solve the problem at this stage.

4. Prototype
The development team at this stage should launch a series of product / service / feature versions to solve the problem. Prototypes can be tested in the team itself, in other departments or in a small group of people who are not members of the development team. This phase is an experimental phase, and its purpose is to determine the best possible solution for each of the problems identified during the first three steps.

5. Test
Designers at this stage thoroughly test the finished product, using the best solutions selected at the stage of prototyping. This is the final stage of the five-stage model.
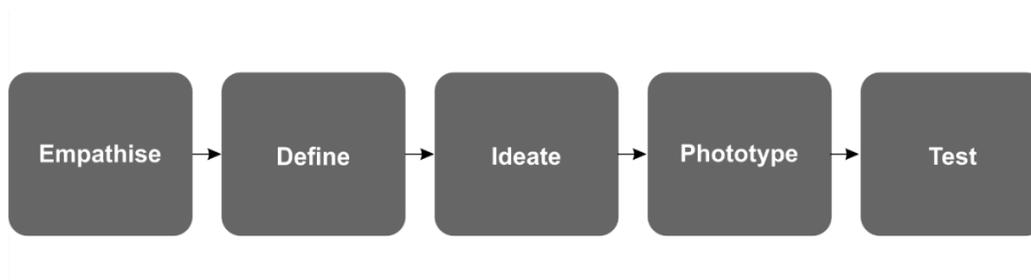

Figure 1. Scheme stages of project thinking based on the scientific works of Herbert Simon

Project thinking minimizes the uncertainty and risks of the results, attracting customers or users through a series of prototypes, in order to further study, test and improve the concepts. Designers, in this case, rely on knowledge of customers obtained in real experiments and tests, and not only relying on historical data or market research.

Design thinking is based on practice, and the inevitable consequence of this is that you can acquire the necessary skills only in the process of doing this work (Shtomp, 2012).

Practical "knowledge", of course, is formed directly as a result of the process of activity, which in itself is not fixed in the texts, and, therefore, does not exist in the form of concepts, formulations of laws, concepts and theories. The role of such "implicit" knowledge is very important in the process of the personality formation of the learner, when the surrounding reality is perceived through sensations and actions (Herbert, 1996).

Results and Discussion

With the help of project thinking and creative approach, one can get not only a good result, but also a result that far exceeds the initial expectations (Zaitseva et al, 2018). Therefore, the methodology of project thinking is popular today in many areas of activity.

We have identified a functional model that allows to form project thinking in design students in the process of professional training at the university. Within two years, a complex for the effective development of this model in the university was created and experimentally tested, methodical recommendations for teachers and future designers on the formation of their project thinking were developed.

A successful model for the formation of project thinking of students-designers can be represented in the course of work on the following stages:

1. Theoretical (study of history, scientific methods, analysis of analogues)
2. Normative (analysis of legal forms, official documents and recommendations for implementation and operation)
3. Methodological (providing students in the university with all the necessary materials and resources for the implementation of the project)
4. Practical (project implementation and presentation)
This model can be used in work on such projects as the creation of presentations, the installation of video films and videos, the design of objects, the creation of a portfolio, preparation for exhibitions and competitions.
The whole process of formation of project thinking was built in the form of semester creative tasks that form project thinking operations for students of different design courses. In addition, we introduced new tasks that were aimed at solving during group brainstorming.

The process of project thinking is interactive, flexible and focused on cooperation between designers and users, where the key role in creating a product is performed by how real users think, feel and behave. Therefore, it is very important to work with students-designers to put them in the users' environment, and after that - to solve problems at the level of designers and designers (Radionov, 1996).

Summary

Project thinking should not be seen as a concrete and inflexible approach to design; steps considered in the article serve as a guide to actions that can be applied in the work. To obtain the most truthful information about the project, these steps can be switched, carried out simultaneously and repeated several times in order to concentrate on the best possible solutions to problems.

One of the main advantages of the five-step model is how the knowledge gained at later stages can respond to earlier stages. This creates an endless cycle in which design students continue to receive new ideas, develop new ways of using the product and its possible applications.

Design thinking solves a complex problem through several stages:

1. Empathy: understanding of human needs.
2. Definition: the definition of the problem.
3. Idealization: creating a variety of ideas.
4. Prototyping: a practical approach.
5. Testing: prototype development / problem solving.

Conclusions

By the graduation, the designer faces a huge number of problems, but the main problem of many educational programs is the lack of "life practice" (Kadyjrova and Akhmetshina, 2018). Without understanding how advertising is created, a newspaper is being printed, an interior is being designed in the real world in the interaction of the whole team, in conditions of tight deadlines and stress it is very difficult to get started. That is why during practical and laboratory classes it is necessary to carry out complex measures for the formation of project thinking.

The pedagogical process should be oriented towards the development of the student as a person with an active civic position. Creative and scientific activity (design of small architectural forms, social posters, creation of video clips, etc.) will allow students of design specialties to successfully apply and consolidate their knowledge, skills and skills (Salakhov et al, 2017). What is the greatest value of using project thinking? First of all, it is an opportunity to ensure that the final results of the project (product, service, digital tool) really meet the needs of consumers and meet their expectations, habits and changing technological trends.

Design and project activities, as the main areas of application of project thinking, are a complex synthesis of science and art, practical and theoretical human activity. Project activity requires a powerful theoretical base that uses scientific and art knowledge, the universality of their application in different situations, the use of experience accumulated by mankind in the history of the formation of the objective world (Grigoriev, 2007).

Reference

Akhmetshina, G., Borodina, S., Salakhova, R. (2017), Information and Bibliographic Resources on the Design Theory", The Turkish Online Journal of Design, Art and Communication, Special Edition, Vol. 7, pp. 1294-1298.

Clemente, V., Vieira, R., Tschimmel, K. (2016), A learning toolkit to promote creative and critical thinking in product design and development through Design Thinking, International Conference of the Portuguese Society for Engineering Education (CISPEE), Vila Real, pp. 1-6.

Cross, N. (2011), Design Thinking: Understanding How Designers Think and Work, Oxford, pp. 1 – 6.

Grigoriev, (2007), Formation of Project Thinking of Design Students in the Process of Professional Training as a Pedagogical Problem, Siberian Pedagogical Journal, No. 11, p. 211.

Herbert, A.S., (1996), The Sciences of the Artificial", MIT Press, London, p. 241.

Kadyjrova, L., Akhmetshina, E. (2018), The place and role of museum pedagogy in the system of higher artistic-pedagogical education, National Academy of Managerial Staff of Culture and Arts Herald, pp. 274-277.

McKilligan, S., Fila, N., Rover, D., Mina, M. (2017), Design thinking as a catalyst for changing teaching and learning practices in engineering, Frontiers in Education Conference (FIE) Indianapolis, IN, USA, pp. 1-8.

Mishina, A., Javgildina, Z., Mishina, N. (2016), The art and project activity as a means of pre - professional development of teenagers' graphical skills", The Turkish Online Journal of Design, Art

and Communication, TOJDAC November Special Edition, pp. 2427-2432.

Radionov, V. (1996), Theoretical Foundations of Pedagogical Design, St. Petersburg, p. 37.

Salakhov, R., Salakhova, R., Gaptraupova, Z. (2017), Ecological Culture of the Student: Formation Problems", Philological Sciences. Questions of theory and practice, No. 7 (73), pp. 204-207.

Shtomp, G. (2012), Project thinking, is not about reflection, but about actions, Problems of management in social systems, Tomsk, pp. 68-72.

Zaitseva, L., Mayorova, I., Fedorenko, M. (2018), Gifted Students' Personal Features Comparative Analysis Depending on Style Preferences in Painting, HELIX, Vol. 8, Is. 1, pp. 2858-2862.