FORMING DESIGN THINKING SKILLS DURING THE EDUCATION OF FUTURE SPECIALISTS

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Abstract. The article revealed the meaning of the concepts of «thinking», «design thinking» by theoretically analyzing the scientific works and identifying the psychological and pedagogical features of formation of students' design thinking skills in the educational process. The levels of development of design thinking skills of future specialists, the authors relied on the design thinking criteria, components, and terms cited by scientists in the research. Diagnosing design thinking using a three-level stage, components such as cognitive, analytical, and activity were distinguished by the improvement of the process of forming students' design thinking skills. The experimental part of the research was planned and experimental work was carried out using effective methods.

Surveys were conducted to determine design thinking by methods of «critical thinking», J. Barrett's «Critical Analysis» methodology, and Michael Chaifitz's test to assess the ability to find logical errors. The results of the pedagogical experiment showed the low level of design thinking of students. It needs creation and usage for improving the educational process in HEI. A work plan was created, and during its implementation, the solution to the problem of determining the effectiveness of design thinking was demonstrated based on the analysis of the results of each of the conducted methods. Comparing the results, none of the stages of development of design thinking could exclude an insufficient level; showed the highest indicator of students' cognitive stage; the analytical component of design thinking posed the greatest challenge, with only 69% of students indicating they were ready to make logical connections, and 13% saying they had great difficulty making them. It is possible to influence students by encouraging responsibility and independence, realizing awareness, creativity, self-development, learning to monitor, generalize, compare, and increase their attention in order to form design thinking skills, and the formation of design thinking skills is not enough.

Key words: design thinking, skill, thinking, future specialist, formation, process, research, method, education, science, action, knowledge, analytics, activity, creativity, flexibility, emotion, consistency, intelligence, and ability

Introduction

The possibility of a special organization of the educational process, which involves the use of new methods, technologies, forms, and tools that affect the creation of its content and the formation of design thinking skills in the educational process of training future specialists in modern higher educational institutions, and the need to focus on design thinking skills by introducing innovative changes. In the study of the needs of today's society, it can be seen that the formation of design thinking skills in the process of education of future specialists is an urgent problem because it is the rapid growth of science and unified world information, the emergence of a global educational space, and interest, activity, creativity in design activities. , is very important for intellectual development. At the same time, it is aimed at understanding its meaning, providing a comprehensive practical

perspective, scientific project, psychological-pedagogical provision, and forming skills of professional values, and competitiveness through this design thinking.

The design thinking skills of a modern specialist are not only to transform and coordinate the subject environment but also to implement practical and prospective situations that determine the main directions in the educational process. The peculiarity of the training process of future specialists lies in the activities of design thinking, which, in turn, depends on the development of scientific design and competitiveness, the culture of design thinking. This means that future specialists are invited to prepare for professionalism. Design thinking is a reflection of the qualitative improvement of psychological and pedagogical support in the educational process, which sets specific requirements for the training of future specialists. Such a view gives a new concept, because design thinking, and developing its skills in the educational process is becoming one of the urgent tasks of modern education and is based on the ideas of various models of global education.

That's why it is necessary to stimulate responsibility and independence in students through design thinking, to realize awareness and creativity, and to learn to develop, monitor, generalize, compare, and increase their concentration. It is known that the individualization of our country in the global world will be realized through educated, energetic, spiritually rich young future specialists.

In this regard, International Organizations (IQ), non-governmental organizations, and selected governments consider education as a way to promote a more open and inclusive world and a tool to achieve sustainable development [1].

Therefore, the effectiveness of using skills in the educational process through design thinking will help future specialists to think creatively. It is important to form design thinking skills by using many teaching methods.

What we mean by thinking is a complex psychological process, as a result of which new knowledge emerges from ignorance. Thinking is an active process, the final results of which are determined by the direction of thinking and the nature of interaction with impressions and memory material, subconscious, intuition, and imagination. The level of plasticity of thinking, and the ability to adapt to various goals of human activity is high. Therefore, the formation of the field of design thinking of future specialists [2].

The main feature of design thinking, unlike analytical thinking, is not a critical analysis, but a creative process that sometimes brings the most unexpected ideas to the best solution to a problem.

Design thinking as a problem-solving process. According to Herbert Simon, there are 7 stages of design thinking:
1. Defining the problem;
2. Research.
3. Formation of thinking.
4. Prototyping.
5. Choose the closest solution.
6. Implementation of the decision.
7. Evaluation of results.

During these stages, reports are compiled, the right questions are asked, ideas are considered, and the best solutions are chosen. In addition, these stages are not linear - different stages can be completed at the same time and, if necessary, return to certain stages [3].

The design includes a good base for various activities and includes fundamental knowledge. According to L. B. Pereverzev:

- develops innate abilities to solve design problems;

- design helps mental development in material ways;

- design creates favorable conditions for the development of non-verbal thinking and communication abilities" [4].

The development of design thinking began in 2004 at Stanford University. Introducing Design Thinking into education and science for the first time. The founders are David Kelly, founder of IDEO, and Hasso Plattner, founder of SAP. On campus, they founded the first Stanford School of Design Thinking. An important tenet of D. schools is that institutions offer design thinking education for non-designers [5].

The term "design thinking" can be interpreted as a type of thinking characterized by the presence of a special knowledge system, as well as a non-standard relationship formed by the thinking subject to objective reality and the way of life in it [6].

Design thinking increases the quality of self-training, using creative ideas and a creative approach to solving any problem with the help of its unique structure and well-thought-out stages of action [7].

Design thinking is primarily a form of creative thinking.

What is creative thinking? Design thinking is part of creative thinking. The American psychologist J. Gilford formulated the answer to our proposed question. He believed that creative thinking is dominated by four distinct qualities.

Originality, uniqueness of the expressed ideas, and a clear desire for intellectual innovation. A creative person almost always and everywhere seeks to find a solution that differs from others.

Semantic flexibility, that is, the ability to see an object from a new angle, discover its new use, and expand its practical functional use.

Figural adaptation flexibility is the ability to change an object so that you can see its new sides, which are hidden from the control of perception.

Semantic spontaneous flexibility, that is, the ability to produce different ideas in an uncertain situation, in particular, in the absence of instructions for these ideas.

Creative design thinking can be characterized by flexibility, emotionality, consistency, and originality. A significant part of tasks in the first two types of creativity (technical and scientific) can be solved by analogy [8].

Design thinking is an iterative process that seeks to understand users, challenge assumptions, redefine problems, and create innovative solutions that can be prototyped and tested. The overall goal is to identify alternative strategies and solutions that are not immediately apparent at your initial level of understanding [9].

So, design thinking, and organization of psychological and pedagogical support of students' educational experience allows the teacher not only to organize the creative process of collective interdisciplinary work but also to reveal the individual capabilities of each student. Such support helps students to choose their specialists in the future, helps to see and understand the psychological characteristics of students, hidden needs and interests, and forms the ability of students to act in difficult situations [10].

Materials and methods

The methods of formation of design thinking skills are based on a well-thought-out effective educational process, during the lesson they learn to analyze and differentiate all the received information. In the learning process, designs play an important role in the formation of thinking skills, as they allow capturing unformed thoughts or images, examining them comprehensively, and "awakening the mind".

The main purpose of design thinking is to make schoolchildren active and think positively, to learn to evaluate problems from the point of view of design thinking and to strengthen their scientific and creative skills.

In Kokshetau was carry out experimental work on the effective formation of design thinking skills of students during the educational process. Based on the 2-3-year students of pedagogy and psychology specialists of Sh. Ualikhanov KU, we conducted a practical experiment. 37 students participated in the experiment. Educational work was conducted with students from the "Fundamentals of Scientific Research" subject.

In this study, the teaching-methodical tool for 2-3 year students of "Pedagogy and Psychology" specialty was used during the performance of scientific and creative tasks. These methods are to form students' logical thinking, emotional flexibility and functional literacy skills. The main goal of the research work is to increase the cognitive, analytical and active abilities of future teacher-psychologists. The results of the research methods are presented in the form of a table and a histogram. Research shows that design thinking skills can be improved by using tasks described in the study guide to identify students' perspectives.   The purpose of the identification stage of the research is to determine the level of formation of design thinking skills of students in the educational process.

The inclusion of the concept of critical thinking in describing design thinking is a relatively recent phenomenon. Critical thinking is generally defined as a procedure for analyzing various data based on formal and informal logical methods used to predict the consequences of certain actions.

Based on the identified levels of design thinking skills formation, as well as the structure of the three stages of design thinking, we selected a diagnostic tool for students' level of design thinking formation: a survey to determine the level of student's knowledge. The concept of "critical thinking", J. Barrett's [11] "Critical Analysis" methodology, and Michael Chaifitz's [12] test for evaluating the ability to find logical errors were used.

Table 1 - Interrelationship of stages of design thinking and methods of their diagnosis

Stages of design thinking	Methods
Educational	Questionnaire to determine the level of knowledge of students about the concept of "design thinking".
Analytical	J. Barrett's "Critical Analysis" method
Activity	Conducting a test to assess the ability to find logical errors by Michael Chaifitz.

Results

In the first stage, a questionnaire was conducted based on a descriptive experiment, the purpose of which was to determine the level of knowledge of students about the concept of "design thinking". Further, J. Barrett's "Critical Analysis" method was implemented. In this method, students determine their ability to establish logical connections between words based on their existing knowledge about the meaning of each word. Alternative answers are suggested for each method question. J. Barrett "Critical analysis" methodology. This test assesses the ability to make logical conclusions based on the given instructions and presented information (which is always enough to make the correct conclusion). Sometimes you need to work with a lot of information. That's why we recommend summarizing on a draft sheet. Draw diagrams or take notes if you like. This test mainly assesses the ability to think logically using words, concepts and reasoning. If you perform better on this test than on other logic tests, then you may be suitable for professions related to oral communication and analysis of written documents. Sciences that require these abilities are humanities, linguistics, as well as cybernetics and philosophy.

Next, it was given Michael Chaifitz's test to evaluate his ability to find logical errors.

Table 2 - Summary table of the results of the identification period of the study

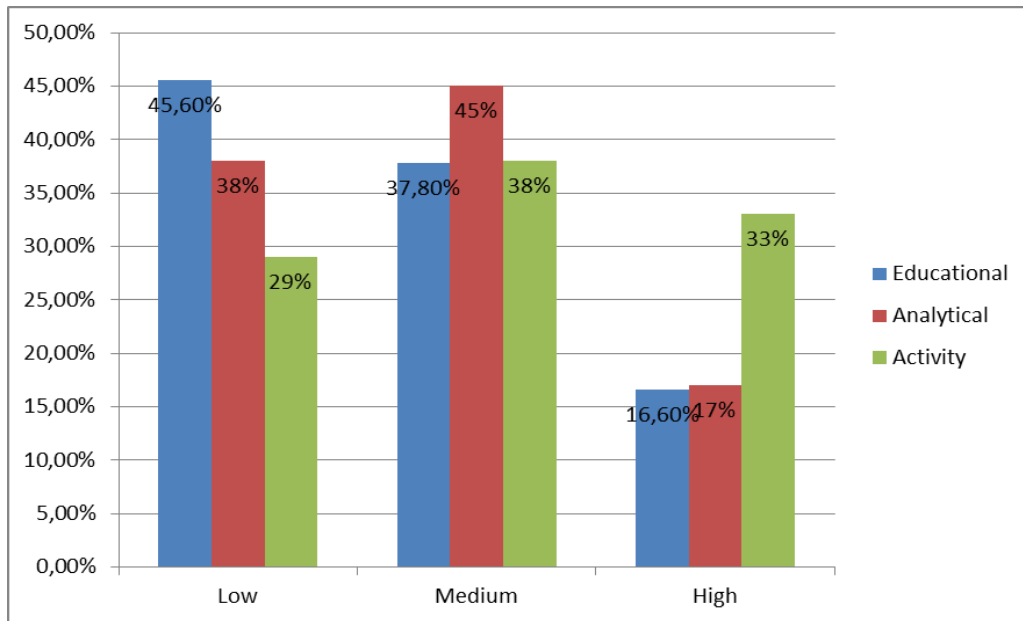| Stages of design thinking	Low	Medium	High
Educational	45,6%	37,8%	16,6%
Analytical	38%	45%	17%
Activity	29%	38%	33%

Figure 1 - An indicator of the results of the development of students' design thinking skills according to the identification experiment

According to the results of the survey, the following results were obtained:

45.6% of students are not familiar with the concept of design thinking, 37.8% of students have an understanding of this concept, but make mistakes in describing it, 16.6% of students were able to reveal sufficient knowledge of this concept, and did not make mistakes in describing design thinking.

Further, J. Barrett's "Critical Analysis" method was implemented. According to the results of this technique, the following results were obtained: 38% of students showed a low level of development of the ability to make logical connections, and also, the meaning of many words was unclear, which indicates an insufficient level of worldview. 45% showed an average level. This showed that the students knew the meaning of all the presented words, and could choose analogies, but could not fully establish logical connections. 17% of students showed a high level, which means that they have a high ability to find logical connections. Next, Michael Chaifitz's test was conducted to evaluate the ability to find logical errors. To evaluate the ability to find these logical errors, Michael Chaifitz's test was performed. Algorithm. Tasks are assigned to topics. In each task, there are two interrelated judgments and a conclusion. It is known that some statements are correct and others are incorrect. It is necessary to determine which conclusion is correct and which is incorrect. The thinking time for each task is ten seconds.

According to the results of this test: 29% of students have low consistency and frequent logical errors, 38% of students have an average speed of consistency and the inability to identify errors in judgment of other people, and 33% of students have good and high consistency in reasoning.

In addition, if we talk about the methodology of development of design thinking, in the process of introducing methods through design thinking: the ability

to act in a group; design of subject materials; creative interpretation of available information; distribution of information according to the level of novelty and importance; possibility to integrate separate subjects; personal training develops. This development allows not only the reception of any information but also the ability to evaluate, understand and use design thinking.

The analysis of the results of the repeated diagnosis made it possible to make the following conclusions:

- cognitive stage (survey): 9% of students' design thinking

showed low familiarity with the concept, 33% have an understanding of this concept, but make mistakes in describing it, and 58% of students determined that they have high enough knowledge of the concept of design thinking. A comparative analysis of the results of the stages of research definition and formation is shown in Figure 2.

Table 3 - Indicator results of the cognitive stage of the repeated experiment

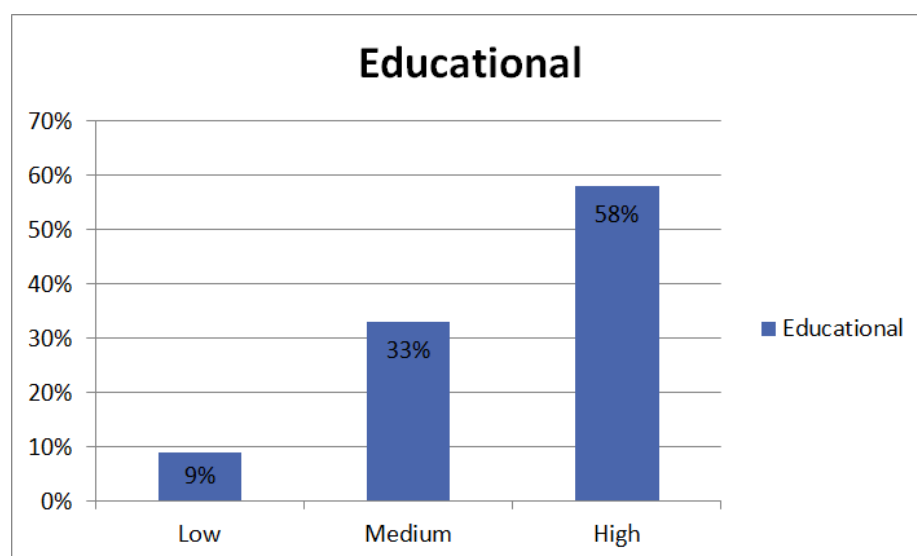| Stages of design thinking	Low	Medium	High
Educational	9%	33%	58%

Figure 2 - Comparative analysis indicator of the experiment to determine and form the results of the development of the cognitive stage of design thinking.

According to the received data, the high level of formation of the cognitive stage of design thinking increased by 58%, it was found to be at a low level in 9% of students, which is 33% less than in the detection period.

- analytical stage (J. Barrett's "Critical Analysis" method): 13% of students showed a low level of development of logical communication abilities, 39% showed an average level, and 48% showed a high level.

Figure 3 presents a comparative analysis of the results of the development of the analytical stage of design thinking during the stages of identification and repetition in the experimental experiment.

Table 5 - Indicator results from the analytical stage of the repeated experiment

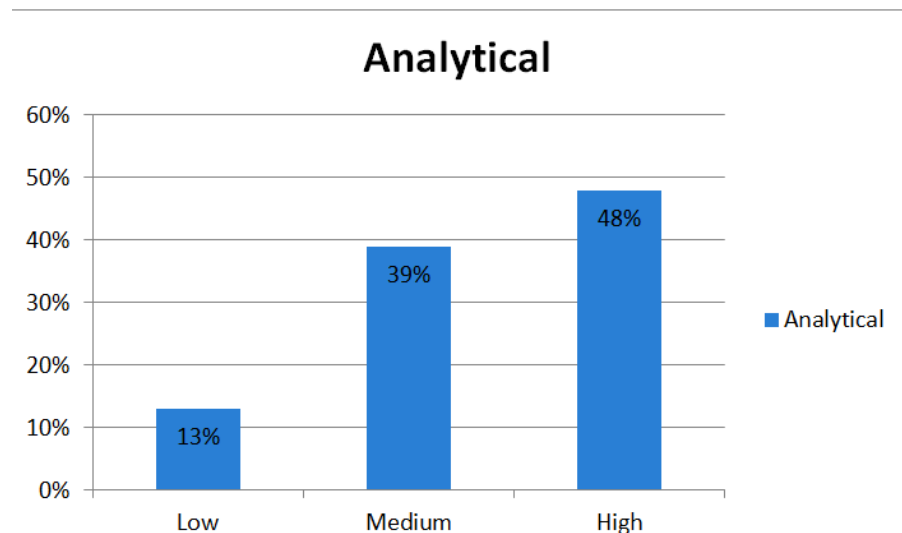| Stages of design thinking	Low	Medium	High
Analytical	13%	39%	48%

Figure 3 - Determining and forming the results of the development of the analytical stage of design thinking is a comparative analysis indicator of the experiment.

According to the received data, 48% of students showed a high level, which is more than 39%, and 13% showed that the level of development of the analytical stage was raised to a high level. Here it was found that 11% of students are not enough at the formation level.
- active period (Michael Chaifitz's test): 9% of students
showed low consistency and often make logical errors, 37% were found to be unable to notice average consistency and errors, and 54% of students had a good and high level of consistency when proving.
A comparative analysis of the results of the development of the active component of design thinking during the stages of research identification and repetition is presented in Figure 4.

Table 5 - Indicator results of the repeated experiment during the activity period

Stages of design thinking	Low	Medium	High

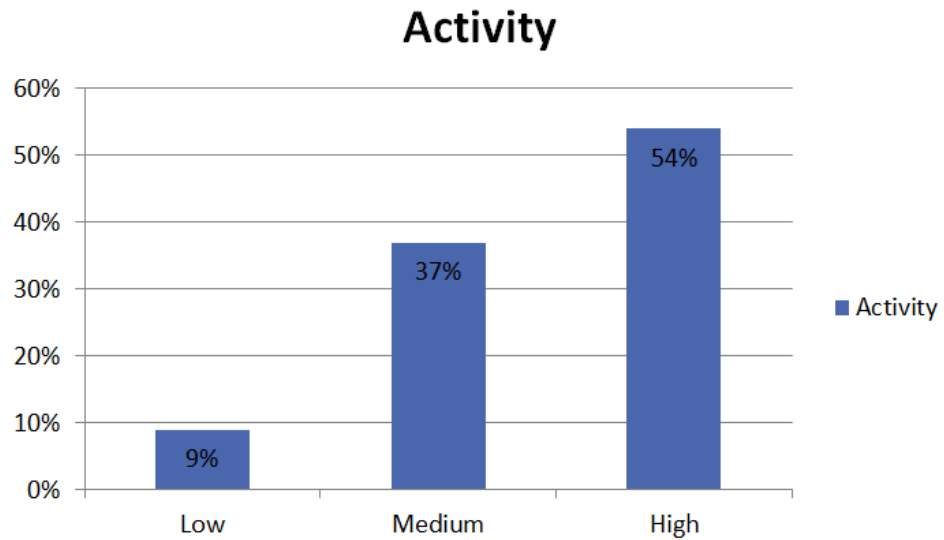| Activity	9%	37%	54%

Figure 4 - Comparative analysis indicator of the experiment to determine and form the results of the development of the activity stage of design thinking.

Table 6 - Indicator result of formation stages of repeated experiment

Stages of design thinking	Low	Medium	High
Educational	9%	33%	58%
Analytical	13%	39%	48%
Activity	9%	37%	54%

Discussion

Design thinking is an anthropocentric process that seeks solutions to everyday problems and creates innovation. Design refers to a very practical approach to creating new solutions, which allows learning by doing and uses feedback to iterate and prototype ideas [13], considers design thinking necessary to help people form knowledge systems, guides people to identify connections between knowledge and practical problems, thereby forming the ability to create new knowledge to solve more complex problems.

The context of the use of design thinking in education [14,15] shows that teaching design thinking is the creation, development, and adoption of new knowledge frameworks to solve problems encountered in the learning process. It was asserted that such knowledge should not only be pure theoretical knowledge or practical knowledge but also a new type of knowledge resulting from the synthesis of design thinking and the uniform application of digitization.

Formation of design thinking skills in the educational process is one of the important categories of future specialists and is considered a necessary condition for students to realize their professional profession in design thinking, and global

thinking. We have noticed that many methods should be used to change design thinking skills, but the most difficult thing for future professionals is still to prevent mistakes. Most of the students have difficulty in coming up with solutions to different situations. Also, it is necessary to note low performance as an individual. A manifestation of personal qualities such as a lack of free initiative, and low motives was observed. At the same time, it was seen that the low level of activity and lack of independence should be given special attention in the educational process. In this study, it was not possible to separate control and experimental groups. Therefore, a conclusion was made based on the analysis of the results of the experimental group about the effectiveness of the implemented work plan of the subject taken in the study. The formation of design thinking skills contributed to the increase in the level of formation in all its components, in our opinion, the correspondence of the content, forms, methods, and methods of the implementation of the work plan to the intended results of mastering the subject. We were able to see here the dangers that contributed to the formation of design thinking skills in the educational process of students. It should also be noted that various external and internal factors have a great influence on the formation of design thinking skills of future specialists, the main of which is the personal character and qualities of a person, and the need to create suitable pedagogical conditions. We hope to achieve those conditions in our future research.

Conclusion

As one of the skills of the 21st century, design thinking should be the result of learning educational plans in universities. Based on this position, we conducted research. We have significantly achieved the goal set to study the effectiveness of our work plan created in the "Fundamentals of scientific research" subject lesson in the course of using methods in the development of design thinking.

According to the obtained results, the percentage of students who showed a low level decreased to 9%, and a high level was shown to 54%, which was 37% more than the detection period.

Comparing the results of the research of identification and formation, it was found: none of the stages of development of design thinking could exclude an insufficient level; showed the highest indicator of students' cognitive stage; the analytical component of design thinking posed the greatest challenge, with only 69% of students indicating they were ready to make logical connections, and 13% saying they had great difficulty making them.

Participate in classes with great enthusiasm and learn independently, most importantly, cooperation in the learning process, action, creative thinking, teamwork, communication with the teacher and effective reception of information, interests, creative search skills, design thinking methodology for the quality of the lesson, teamwork affected changing the skills and actions.

Our research allowed us to conclude that our proposed hypothesis was proved and the goal was fulfilled. It can be said that this study is incomplete because to complete the educational methodological complex of this subject, it is still in the

future to introduce changes in the educational process to achieve the planned results of the formation of design thinking skills and to clarify and plan the ways to use the effectiveness of design thinking skills to the maximum during the lesson. The analysis of this work is aimed at determining the need and feasibility of using design thinking in the context of digitization in the field of teaching and learning. The results of the study revealed the levels of methods, Design thinking showed a tendency to create ways to success, and the article presented design thinking as a simplified step that helps to better understand design thinking, develop solutions and make decisions, and also to form these activities in the future professionals during the educational process.

ЛИТЕРАТУРА

[1] Auld E., Morris P. Science by Streetlight and the OECD's Measure of Global Competence: A new Yardstick for Internationalisation? //Policy Futures in Education. - 2019. - 17 (6). – p. 677– 698.

[2] Дударева Н.В. Психолого-педагогические основы формирования проектного мышления учащихся и студентов профобразования //Современные проблемы науки и образования – 2008. – № 8. - Режим доступа: URL: https://science-education.ru/ru/article/view?id=3625 [Дата обращения: 11.04.2023].

[3] Щетинина Е.А. Дизайн-мышление в бизнес-стратегиях корпораций //Экономика и экологический менеджмент. 2021. №1. [Электронный ресурс]. – Режим доступа: URL: https://cyberleninka.ru/article/n/dizayn-myshlenie-v-biznes-strategiyah-korporatsiy [Дата обращения: 15.11.2023].

[4] Катханова Ю. Ф. Технология дополненной реальности в образовании / Ю. Ф. Катханова, К. И. Бестыбаева. – [Электронный ресурс] //Педагогическое мастерство и современные педагогические технологии: материалы VIII Междунар. науч.-практ.конф. (Чебоксары, 17июля 2016 г.). Чебоксары: ЦНС «Интерактив плюс», - 2016. – С. 37-40. URL: https://elibrary.ru/item.asp?id=35361243. [Дата обращения: 11.04.2023].

[5] Dunne D., Martin R. Design thinking and how it will change management education: an interview and discussion //Academy of Management Learning and Education. - 2006. - Vol. 5. - No. 4. - P. 512-523.

[6] Kunrath K. Designers' Professional Identity: Personal Attributes and Design Skills / K. Kunrath //Engineering Design. – 2020. – No3. – p. 330-348.

[7] Гвозденко Ю.В., Ищенко А.А., Пилипенко А.В. Развитие дизайн-мышления школьников при анализе результатов учебных достижений // Международный студенческий научный вестник. – 2019. – № 3. – Режим доступа: URL: https://eduherald.ru/ru/article/view?id=19642 [Дата обращения: 15.04.2023].

[8] Гилфорд Дж. Концепция креативности. [Электронный ресурс] URL: http://lektsia.com/7x637d.html [Дата обращения: 13.04.2023].

[9] Dam, R., & Siang, T. (2022). What is design thinking and why is it so popular? The Interaction Design Foundation. – Режим доступа: https://www.researchgate.net/publication/365346609_Design_Thinking_as_an_Innovative_Method_of_Formation_of_Creativity_Skills_in_Students_of_Higher_Education [Дата обращения: 13.04.2023].

[10] Шилехина М.С. Дизайн-мышление как современный подход для создания инновационных продуктов //Вектор науки ТГУ. - 2013. -№4. - С. 181–183.

[11] Баррет Дж. Карьера: способности и выбор / Дж. Баррет. – М.: АСТ: Астрель, - 2006. – 206 с.

[12] Гребень, Н. Ф. Психологические тесты для профессионалов. - Минск: Современная школа, - 2008. – С. 496.

[13] Tomita Y., & Maeno T. (2018). Designing Structured Design Thinking Framework for Societal System Design in the Unknown Context. // Management and Strategy. - 2018. - 9 (3). - p.103-113.

[14] Postlethwaite S. Investigating Creative Processes and Pedagogy in the UK: Fashion Thinking. Fashion Practice, 2022. – p. 1-10.

[15] Schmidt, K. Zarestky, J. The State of Fashion Design Pedagogy: The Roles of Students and Instructors, In: 14th International Conference of the European Academy of Design, Safe Harbours for Design Research. São Paulo: Blucher, 2021. - p. 121-129.

REFERENCES

[1] Auld E., Morris P. Science by Streetlight and the OECD's Measure of Global Competence: A new Yardstick for Internationalisation? //Policy Futures in Education. - 2019. - 17 (6). - – p. 677– 698.

[2] Dudareva N.V. Psikhologo-pedagogicheskiye osnovy formirovaniya proyektnogo myshleniya uchashchikhsya i studentov profobrazovaniya (Psychological and pedagogical foundations of the formation of project thinking of students and students of vocational education) //Sovremennyye problemy nauki i obrazovaniya – 2008. – № 8. - Rezhim dostupa: URL: https://science-education.ru/ru/article/view?id=3625 [Data obrashcheniya: 11.04.2023]. [in Rus]

[3] Shchetinina Ye.A. Dizayn-myshleniye v biznes-strategiyakh korporatsiy (Design thinking in corporate business strategies) //Ekonomika i ekologicheskiy menedzhment. 2021. №1. [Elektronnyy resurs]. – Rezhim dostupa: URL: https://cyberleninka.ru/article/n/dizayn-myshlenie-v-biznes-strategiyah-korporatsiy [Data obrashcheniya: 15.11.2023]. [in Rus]

[4] Katkhanova YU. F. Tekhnologiya dopolnennoĭ real'nosti v obrazovanii (Augmented reality technology in education) /YU. F. Katkhanova, K. I. Bestybayeva. – [Elektronnyy resurs] //Pedagogicheskoye masterstvo i sovremennyye pedagogicheskiye tekhnologii: materialy VIII Mezhdunar. nauch.-prakt.konf. (Cheboksary, 17iyulya 2016 g.). Cheboksary: TSNS «Interaktiv plyus», - 2016. – S. 37-40. URL: https://elibrary.ru/item.asp?id=35361243. [Data obrashcheniya: 11.04.2023 [in Rus]

[5] Dunne D., Martin R. Design thinking and how it will change management education: an interview and discussion //Academy of Management Learning and Education. - 2006. - Vol. 5. - No. 4. - P. 512-523.

[6] Kunrath K. Designers' Professional Identity: Personal Attributes and Design Skills / K. Kunrath //Engineering Design. – 2020. – No3. – p. 330-348.

[7] Gvozdenko YU.V., Ishchenko A.A., Pilipenko A.V. Razvitiye dizayn-myshleniya shkol'nikov pri analize rezul'tatov uchebnykh dostizheniy (Development of design thinking of schoolchildren in the analysis of educational achievements) //Mezhdunarodnyy studencheskiy nauchnyy vestnik. – 2019. – № 3. – Rezhim dostupa: URL: https://eduherald.ru/ru/article/view?id=19642 [Data obrashcheniya: 15.04.2023]. [in Rus]

[8] Gilford Dzh. Kontseptsiya kreativnosti (The concept of creativity) [Elektronnyy resurs] URL: http://lektsia.com/7x637d.html [Data obrashcheniya: 13.04.2023] [in Rus]

[9] Dam, R., & Siang, T. (2022). What is design thinking and why is it so popular? The Interaction Design Foundation. – Режим доступа: https://www.researchgate.net/publication/365346609_Design_Thinking_as_an_Innovative_Method_of_Formation_of_Creativity_Skills_in_Students_of_Higher_Education [Дата обращения: 13.04.2023].

[10] Shilekhina M.S. Dizaĭn-myshleniye kak sovremennyĭ podkhod dlya sozdaniya innovatsionnykh produktov (Design thinking as a modern approach to creating innovative products) // Vektor nauki TGU. - 2013. -№4. - S. 181–183. [in Rus]

[11] Barret Dzh. Kar'yera: sposobnosti i vybor (Career: abilities and choice) / Dzh. Barret. – M.: AST: Astrel', - 2006. – 206 s. [in Rus]

[12] Greben', N. F. Psikhologicheskiye testy dlya professionalov (Psychological tests for professionals). - Minsk: Sovremennaya shkola, - 2008. – С. 49

[13] Tomita Y., & Maeno T. (2018). Designing Structured Design Thinking Framework for Societal System Design in the Unknown Context. // Management and Strategy. - 2018. - 9 (3). - р.103-113.

[14] Postlethwaite S. Investigating Creative Processes and Pedagogy in the UK: Fashion Thinking. Fashion Practice, 2022. – p. 1-10.

[15] Schmidt, K. Zarestky, J. The State of Fashion Design Pedagogy: The Roles of Students and Instructors, In: 14th International Conference of the European Academy of Design, Safe Harbours for Design Research. São Paulo: Blucher, 2021. - p. 121-129.

ФОРМИРОВАНИЕ НАВЫКОВ ДИЗАЙН-МЫШЛЕНИЯ В ПРОЦЕССЕ ОБУЧЕНИЯ БУДУЩИХ СПЕЦИАЛИСТОВ

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Аннотация. В статье путем теоретического анализа научных трудов ученых раскрыто значение понятий «мышление» и «дизайн-мышление», а также выявлены психолого-педагогические особенности формирования умений дизайн-мышления у студентов в образовательном процессе. Для определения уровней развития навыков дизайн-мышления у будущих специалистов авторы опирались на критерии, компоненты и термины дизайн-мышления, которые приводят ученые в исследовании. При диагностике дизайн-мышления на трехуровневом этапе были выделены такие компоненты, как познавательный, аналитический, деятельностный, основанные на совершенствовании процесса формирования навыков дизайн-мышления у студентов. Была запланирована экспериментальная часть исследования и проведены экспериментальные работы с применением эффективных методов.

Были проведены опросы для определения дизайн-мышления. Концепция «критического мышления». Использовалась методология «Критического анализа» Дж. Баррета, тест Майкла Чейфица для оценки способности находить логические ошибки. Результаты идентификационного этапа педагогического эксперимента показали низкий уровень дизайн-мышления учащихся. Это показало необходимость создания или использования методов, направленных на совершенствование учебного процесса при подготовке будущих специалистов в системе высшего образования.

По результатам идентификационного этапа исследования был составлен план работы, в ходе его реализации продемонстрировано решение задачи определения эффективности дизайн-мышления в процессе подготовки будущих специалистов на основе анализа результаты каждого из проведенных методов. Сравнивая результаты исследования выявления и формирования, выяснилось следующее: ни один из этапов развития дизайн-мышления не мог исключить недостаточный уровень; показал самый высокий показатель познавательного уровня студентов; Аналитический компонент дизайн-мышления представлял наибольшую проблему: только 69% студентов указали, что готовы устанавливать логические связи, а 13% заявили, что испытывают большие трудности с их созданием. Анализируя проблему исследования, можно воздействовать на учащихся путем воспитания ответственности и самостоятельности, реализации осознанности, творческих способностей, саморазвития, обучения контролировать, обобщать, сравнивать, повышать внимание с целью формирования навыков дизайн-мышления, формирования навыков дизайн-мышления недостаточно. Полагая, что это исследуемый феномен, наша исследовательская работа все еще продолжается. Формирование навыков дизайн-мышления осуществлялось путем утверждения критериев.

БОЛАШАҚ МАМАНДАРДЫҢ ОҚУ ҮДЕРІСІНДЕ ДИЗАЙН ОЙЛАУ ДАҒДЫЛАРЫН ҚАЛЫПТАСТЫРУ

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Аңдатпа. Мақалада ғалымдардың ғылыми еңбектерін теориялық тұрғыда талдау арқылы «ойлау» және «дизайн ойлау» ұғымдарының мәнін ашып, студенттердің дизайн ойлау дағдыларын оқу үдерісінде қалыптастырудың психологиялық-педагогикалық ерекшеліктері анықталды. Болашақ мамандардың дизайн ойлау дағдыларының қалыптастыру деңгейлерін анықтау үшін авторлар зерттеулерде ғалымдардың келтірген дизайн ойлау критерийлері мен құрамдас бөліктеріне, терминдеріне сүйендік. Дизайн ойлауды диагностикалау үш деңгейлік кезеңді пайдаланып, студенттердің дизайн ойлау дағдыларын қалыптастыру үдерісін жетілдіру негізінде танымдық, аналитикалық, белсенділік сияқты компоненттері ажыратылды. Зерттеудің тәжірибелік бөлімі жоспарланып, тиімді әдістер қолданылып тәжірибелік-эксперимент жұмыстары жүргізілді.

Дизайн ойлауын анықтауға арналған сауалнамалар өткізілді. «Сыни ойлау» концепциясын, Дж. Барреттің «Сыни талдау» әдістемесін, Майкл Чейфицтің логикалық қателерді табу қабілетін бағалау тест қолданылды. Педагогикалық эксперименттің анықтау кезеңінің алынған нәтижелері студенттердің дизайн ойлау деңгейінің төмендігін көрсетті. Бұл жоғары білім беру жүйесінде болашақ мамандарды даярлауда оқу үдерісін жетілдіруге бағытталған әдістерді жасау немесе қолдану қажеттілігін көрсетті. Зерттеудің анықтау кезеңінің нәтижелері бойынша жұмыс жоспары жасалып, жүзеге асыру барысында болашақ мамандарды оқу үдерісінде дизайн ойлауын тиімділігін анықтау мәселесін шешу әрбір жүргізілген әдістердің нәтижелерін талдау негізінде көрсетілді. Анықтау және қалыптастыру зерттеу нәтижелерін салыстыра отырып, келесілер анықталды: дизайн ойлауды дамытудың бірде-бір кезеңдері жеткіліксіз деңгейді жоққа шығара алмады; студенттердің танымдық кезеңнің ең жоғары көрсеткішін көрсетті; дизайн ойлаудың аналитикалық құрамдас бөлігі ең үлкен қиындық туғызды, студенттердің 69%-ы ғана логикалық байланыстарды орындауға дайын екендерін көрсетеді, ал 13%-ы оларды орындауда өте қиынға соғатындығын білдірді. Зерттеу мәселесіне талдау жасай келе, дизайн ойлау дағдыларын қалыптастыру үшін студенттердің бойына жауапкершілік пен дербестікті ынталандыру, танымдылық, креативтілік көзқарастарын жүзеге асыру, өзін-өзі дамытуға, бақылауға, жалпылауға, салыстыруға үйрену, зейіндерін арттыру арқылы ықпал жасауға мүмкіндік береді және дизайн ойлау дағдыларын қалыптастыру жеткіліксіз зерттелген құбылыс деп ойлап, зерттеу жұмысымыз әлі де жалғасын табуда. Критерийлерді бекіту арқылы дизайн ойлау дағдыларын қалыптастыру жүзеге асырылды.