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PROJECT SKILLS FORMATION OF THE DESIGN STUDENTS

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Abstract

The article presents the modern requirements to the professionally significant qualities of the designers and their level of professional qualification. Readiness level of the applicants and the first- and second-year students to the project activity is analysed. The possibilities of improving the designers' training quality within the university education process are considered. Methods and criteria of competence assessment of future designers are determined. The conducted theoretical analysis proved current importance and insufficient development level in the pedagogical theory of the project skills formation problem of future design specialists in the system of higher professional education. Project activity is the key one in the professional activity of the environment designer. An important part of the professional competence are professional skills and abilities - artistic, modelling, formation, analytical, research, graphical, computer, communication skills. These skills and abilities are directly connected with the professionally significant qualities. An important factor of the successful implementation of the learning activity in the design sphere is the presence of the corresponding skills, their focus on the design activity, positive motivation and the desire to get a high-quality professional education. A set of these components tells us that a student is ready to get the professional education.

Keywords: Assessment, design, education, project activity.

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1. Introduction

Almost all man-made material environment that surrounds us is in some or other way connected with design. The well-used term "design" does not have the precise unambiguous definition. The meaning of this rapidly developing and vividly debated notion could not be defined by one or two phrases. The definition will have the sense only if it features all important interrelations of the design activity.

In design where edges of specific genres are “washed away” the industrial designing evenly merges into scenography, architecture - into entirely artistic process. Nowadays the "universal designer" works at structure formation in the environment where it is quite difficult to distinguish the creative genres. Whatever definition of "design" term is, the design activity meaning is the project activity.

There are still no established customs in the Russian system of design education, as well as there is no generally accepted methodology and teaching methods. It is being developed. The peculiarity of this profession is the instability of the content and nature of the work performed, which is associated with the market demand dynamics. The traditional approach, solution of standard professional tasks still dominates during training the design professionals that fails to meet the actual professional conditions of the designer activity (Plotnikova, 2017).

2. Problem Statement

The project activity has been previously studied within the scope of pedagogical theory and practice. The works of Russian and foreign teachers of the late XX - early XXI centuries (P.P. Blonskiy, J. Dewey, Ye.G. Kagarov, W.H. Kilpatrick, V.N. Shulgin and others) are devoted to the philosophical and methodological basics of the project activity. Its pedagogical rules are studied by V.V. Guzeev, Ye.S. Polat, Yu.L. Khotuntsev, N. V. Matyash and methodological peculiarities are studied by M.I. Gurevich, M.B. Pavlova, I.A. Sasova, J. Pitt, Ye. (Ust-Kachkintseva & Prokopeva 2015). A peculiarity of the design project activity is that it is located at the intersection of engineering and creative components. Creativity itself is the generation of a unique solution that lies outside the palette of common decisions and standards. It is hard to control the activity of creative people, but only they can generate truly outstanding solutions. Provided we consciously treat the process of project activity with creative students, having developed a scheme for development, training, professional activity with the help of different modern technical devices, then it can give a superior result. Scientists have studied separate aspects of creative activity, creativity: non-standard solution of tasks and generation of original ideas - D.B. Bogoyavlenskaya, A.V. Brushlinskiy, J. Gilford, A.M. Matyushkin, S.A. Mednik and others; creative personal fulfilment - V.I. Andreev, V.G. Ryndak and others.

However, project thinking formation model and project skills' formation methodology of the designers have not yet been developed. And only the use of special methods and educational technologies could solve this problem.

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3. Research Questions

A designer is an industrial designer, planner, whose main goal is to develop projects of goods, items and objects which surround people both at the production site, outdoors and at home. So it is the project activity that is main in the design practice.

We consider the project activity as a unique activity that in the best way changes and transforms the world around, has its start- and end-points in the course of time, and which is aimed to achieve a specific result/goal, create a certain, unique product or service (Matyash, 2011).

Environment design as a new type of project activity has recently begun to spread in design education and integrate into the system the achievements of designers of other specialities. Environment design unites in a single project the achievements of designers of other specialities: architects, item designers, decorators, engineers, landscape designers and etc. Therefore, the main activity of a specialist in the field of environment design is the design of interiors, exteriors of residential premises and public institutions and small architectural forms.

A designer must possess professionally important qualities in order to design the environment professionally. The professionally important qualities are individual qualities of the worker that influence on the efficiency of the professional activity and its success rate.

The professionally important qualities of the environment designer are creativity, cognitive flexibility, logic, spatial thinking, communication skills and endurance and stamina.

Creativity is a "level of creative giftedness, creativity talent, which represents quite a stable personal characteristic. The centre path in the creativity study is the identification of personal qualities with which it is associated "(Lapshina, 2010, p. 352).

Cognitive flexibility is an ability to quickly rebuild your way of thinking, freely deal with material, informational and other available resources, find new problem solution options, and establish association links.

Logic is an inner rule appropriate for given phenomena; correct, rational line of reasoning. Understanding of the thinking process itself, specific content of forms and laws, ability to generalize certain thoughts, handle with the obtained formulae and schemes.

Spatial thinking is a type of mental activity which enables to create spatial patterns and operate with them while solving practical and theoretical tasks.

The presence of communication skills is very significant. The ability to communicate with a teacher/ customer/ client correctly and effectively is already half of the project success. If a dialogue is arranged in the right way and all the questions necessary for work implementation are asked, then the task will be solved much faster. The ability to work in teams, generate ideas, listen to others' opinions, dispute with some points of view or protect and defend any of them is essential to the designer (Khomich & Dorofeeva, 2015).

Table 1 shows the professional competencies of the future designer (Federalny gosudarstvenny…, 2016) which are directly connected with the environment design. The corresponding professionally significant qualities are defined (Table 01).

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Table 01. Professional competence and professionally significant qualities of the environment designer

Professional competence (PC)	Professionally significant qualities
analyses and defines the requirements to a design project; prepares a detailed specification of the requirements to a design project; is able to synthesize a set of possible task solutions or approaches to the design project implementation; gives scientific reasons of his/her statements	Cognitive flexibility Logic Spatial thinking Communication skills
can draw, use drawings in the composition practice and redesign them for any object planning; knows the principles of choosing the technique for depicting a particular drawing, possesses skills of linear-structural arrangement and the basics of academic painting, techniques of working with colour and colour compositions, techniques of working in the sphere of prototyping and modelling	Creativity Cognitive flexibility Spatial thinking Logic
develops the project idea based on the conceptual, creative approach to the solution of the designer task; various harmonization methods of forms, structures, complexes and systems; set of functional composition solutions	Creativity Cognitive flexibility Spatial thinking
is able to construct items, products, production prototypes, collections, complexes, buildings, objects; is able to prepare a full set of documents of the design project for its future implementation, to make basic economic calculations of the project	Cognitive flexibility Creativity Logic Communication skills
knows functions and goals of institutions and organizations, knows firms and structural divisions that deal with the design issues; is ready to use the regulatory documents in practice	Cognitive flexibility Logic

It is worth noting that the professional activity does not comply with the learning activity in many respects. However, modern standards require the maximum similarity of the learning process with the professional activity (Vilde & Kozhayev, 2017).

An important factor of the successful implementation of the learning activity in the design sphere is the presence of the corresponding skills, their focus on the design activity, positive motivation and the desire to get a high-quality professional education. A set of these components tells us that a student is ready to get the professional education. Abilities distinguish one person from another, they influence the implementation success of a certain activity. These are potential personal characteristics which actualize under specific circumstances. Ability determines the success rate in mastering actions in this or that activity, sphere. Obviously abilities to the project activity and professionally important qualities will generally coincide (artistic abilities, imagination, creativity, cognitive flexibility, communicability, firmness of purpose, abilities to analysis and synthesis).

The "readiness" concept in pedagogical science is defined as "a complex personal education which includes motivational, substantial and activity, intellectual, communicative and methodological (technological), effective and prognostic components" (Kostyuk, 2013, p. 5). Competence is a potential readiness to solve tasks expertly. Competence units into a seamless whole knowledge, abilities and skills. A competent specialist is able to solve the emerging problems, ready for self-training and improvement in the professional sphere.

Abilities, readiness, focus, motive, motivation, desire are basic in the design training.

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4. Purpose of the Study

Purpose of the research is the development and theoretical justification of project activity skills formation conditions of students studying a degree in "Design".

The research hypothesis is based on the assumption that project activity skills formation of students studying a degree in "Design" will be effective if:

- professionally important qualities of the environment designer and professional skills which stimulate their formation are precisely defined;

- complex of pedagogical conditions of project activity skills formation of students is identified and realized.

The following research tasks are based on the research purpose and hypothesis:

- study the modern state of the design education problem in pedagogical theory;

- define the readiness level of the first and second year students studying a degree in "Design" to the project activity and the state of project skills formation practice in the design education;

- reveal a set of pedagogical conditions that stimulate project activity skills formation.

5. Research Methods

The following *research methods* were used for solution of the set tasks:

- theoretical (analysis of regulatory documents; theoretical analysis of philosophical, sociological and psychological and pedagogical literature; synthesis; comparison; systematization; forecasting; theoretical modelling);
- empirical (analysis and generalization of pedagogical experience; pedagogical experiment; observation; questionnaire; testing; conversation; interview).

The experimental work was carried out on the basis of the Federal State Budget-funded Educational Institution of Higher Education "M. Akmulla Bashkir State Pedagogical University". 60 students took part in the research. They were designer-students of the first (4 groups) and second (2 groups) courses.

In order to predict the effectiveness of the educational process it is necessary to study the basic level of students' training and their existing potential with which they entered to the university.

According to the survey the majority of the first year students had not finished any art schools and did not have any specialized education. Their knowledge in the sphere of art, history and theory of design was minimal.

Different methods were analysed to determine the development level of professionally significant qualities defined during the research (creativity, cognitive flexibility, logic, spatial thinking, communication skills). As a result, we chose the following:

- Diagnostics of mind-sets and creativity level (Bruner, 1977);
- Creativity and cognitive flexibility test (Torrance, 1994);
- Test determining visual-spatial skills (Eysenck, 2001);
- "Spatial thinking" test (Khomskaya, 2005);

Short cognitive ability (selective) test (SCAT) focused on studying of general skills, identification of integral index of general intellectual and communicative skills (Buzin & Wonderlic, 2015).

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6. Findings

The research findings are the following:

1) imaginative and artistic ways of thinking dominate while practical, technical and logical ways show low results. This may indicate that students are more focused on fine arts activity, rather than design;

2) cognitive flexibility of 1 year students is not enough developed. Their drawings are incomplete, sketchy;

3) huge difference between minimum and maximum points in some testing methods. This indicates a different level of student preparedness, the formation of some professionally significant qualities;

4) students possess specific hidden potential which could become a good basis provided if it is developed.

It is especially necessary to pay attention to the low results of logical and spatial thinking tests. These qualities should be improved as professionally significant ones.

Generally, we can make a conclusion that: readiness of 1-2-year students to the project activity is low, professionally significant qualities and project skills and abilities are not developed enough. The above-mentioned facts prove that the research theme is currently important.

Analysis of lessons and students' pieces of art at the examination helped us to find out the following:

1. Small amount of examples in the pre-project research, uniformity of pictures tell about poor research skills.

2. Students make too little drafts, sketches; most of them are of low quality. This indicates that artistic and graphical skills are badly developed.

3. Independent works are not accomplished in full. This speaks about weak will and low motivation.

4. There are a lot of repeated mistakes: students forget to indicate the scale or indicate it incorrectly, absence of staff age, the sequence of drawings is violated (2 course), the composition of the graphical sheet (graphical skills) is not always correct, absence of training transfer from one item to another.

5. During the project defence the majority of students could not express their ideas, concept of the created project. This indicates that the communication skills are badly developed.

6. Structural collective discussion of works is absent; only the teacher indicates on student’s mistakes.

So, according to the attendance of the classes and examination one can make a conclusion that:

- Interdisciplinary method that stimulates transfer of knowledge between subjects and courses is not stated. It is necessary to create the modular education system.
- The tasks are of the same difficulty level for everyone. Students' abilities are not taken into account. Individualization is not stated.
- Absence of the creative environment that would stimulate students' motivation.
- Active methods are not enough included
- There is no adequate assessment, students do not know criteria based on which their knowledge and projects will be evaluated.

The ascertaining experiment results analysis helped us to define the pedagogical conditions of formation of project skills and abilities of students studying a degree in "Design":

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- Interdisciplinary training method which is based on the solution of professionally significant tasks - modular education system,
- Creative environment,
- Inclusion of active teaching methods into the educational process,
- Project activity assessment criteria are determined precisely.

The modular education system is quite a new term for our education system. A module is an entire set of knowledge, skills, attitudes and experience (competencies) subject to learning. This set is described in the form of requirements that a student must meet upon completion of a module and which is an integral part of a more general function.

Purpose of using "modular education" method is organization and implementation of the educational process concentrated on individualism, increase of efficiency and quality of future designers' training as well as formation of universal professional competencies through improvement of interdisciplinary connections, transfer of knowledge between special subjects, end-to-end design where form and material selection is driven by the need to obtain the desired result and a sketch is an integral part of the layout. The methodology will allow to use simultaneously all the methods and techniques used to create the design project (Rumyantseva, & Barinova, 2017).

The recommended modular education system will allow to unlock creativity, use end-to-end design in practice and the main factor is that it will allow 1-2 year students to create projects using knowledge, skills and abilities obtained from several disciplines simultaneously. This will ensure their professional improvement.

In designer profession teaching the educational environment is connected with the creativity development conditions what lead to appearance of "creative environment" term. Creative environment as a social and cultural space assumes presence of a specific society based on integration of conditions and methods of development and self-development of a creative person and involving an active communication of subjects included in it.

Most of the researchers notice that the creative educational environment at the design lessons will be effective if:

1) Students have a constant dialogue

- with the teacher (at the use stage of the obtained information a student needs a mentor, his/her knowledge is not so deep to apply it correctly and extensively; as a partnership, interaction, exchange of views, ideas);

- with each other (skills of effective interaction in the group project, focus on obtaining these skills, student could study principles of leadership and group relationships alone or together with a teacher; teach each other, transfer an experience, analyse mistakes together);

2) Psychological comfort atmosphere is created. Psychological comfort is a qualitative side of interpersonal relationships, combination of psychological conditions that stimulate or block productive joint activity and full development of the human personality.

3) Prompt teacher's support (if the student does not cope with the task, it is necessary give him/her a help, direction, cue where to find new ideas, in which direction to move);

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4) The student is free to act within the task framework (on 1-2 courses it is possible to come up with and develop all kinds of ideas, to work with different tools and materials, on 3-4 courses - it is possible to specify the task);

5) Students' activity assessment relies on the constructive criticism which is based on the objective criteria:

- task accomplishment rate, attitude to work (responsibility, independence, discipline, time management skills),
- quality of current and reporting documents,
- timely execution and implementation of works.

There is constructability in criticism provided one points at the mistakes made by the opponent in correct and tactful way. This is criticism after listening to which it becomes clear how to correct the mistake and how to prevent such mistakes in the future.

6) Works are analysed, discussed, assessed by

- the whole group (this will help to study the issue from various points of view at the same time, find out typical mistakes thereby saving time);
- by several teachers (to show and discuss the mistakes before the start of the lesson, so that during the classes it was possible to correct the work and show it again, and then move on or look for new ideas in a different direction);

7) Competitive basis and rating is organized (this will increase students' interest in disciplines of the professional cycle, reveal and help to develop creative abilities);

8) Collected visual line is integrated with the design history (examples of works indicating an author-designer, year of creation, style and country, what will stimulate to remember the basic data);

9) Integration of some of the project tasks with the tasks on technical drawing, design history, propaedeutic, form making etc. (integration of several disciplines forms the modular education system which aims are interdisciplinary links, transfer of knowledge between the special subjects, end-to-end design where form and material selection is driven by the need to obtain the desired result and a sketch is an integral part of the layout. The methodology will allow to use simultaneously all the methods and techniques used to create the design project) (Khomich & Dorofeeva, 2015).

Thus, the creative educational environment at the design lessons creates conditions of development of personality and its professional qualities.

According to the psychological studies, personality development in professional education is possible provided education is active.

Education will be active if there are such active education methods as:

- role play (for example customer-service provider game. This game will let each student understand the behaviour tactics of these roles, draw up questionnaires with questions and possible answers, learn to listen to, hear, understand and accept opinions of others, learn to persuade);
- play designing is creation of project by a small group where each student has a specific role. Play designing could teach students to work in small groups, teams. It could reveal advantages and disadvantages of the participants and teach to protect team work;
- problem situation when students are actual participants of the situation;

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- group consultation is involvement of a whole group into a discussion, search for problem and its solution. At the consultation a teacher directs students and helps them to find the correct answer;
- brainstorming or relay is a collective generation of ideas aimed to solve the problem, for example during the project concept development. This helps to prepare within a short time a list of the most brilliant plans to be implemented by each of the students (Khomich, 2016).

Project activity assessment of students consists of assessment of the project itself and its defence. Assessment of the whole group of students could be carried out with the help of specially developed questionnaires. A teacher summarizes assessment results.

Project assessment criteria:

1. Reasonableness of theme selection, statement of need, practical focus of the project and work implementation significance.

2. Scope and completeness of development works, execution of the accepted project stages, independence, accomplishment, readiness of the project to be understood by other people, project embodiment.

3. Reasonableness of suggested solutions, approaches, conclusions.

4. Creativity level, originality of theme, approaches, found solutions, suggested arguments, originality of project embodiment and presentation.

5. Quality of the explanatory note: execution, compliance with the standard requirements, quality of sketches, drawings' schemes; quality and completeness of reviews, presentation quality, impression.

6. Product quality, compliance with the standards, originality.

Defence assessment criteria of the completed project:

1. Report quality: composition, full disclosure of the work, approaches, results; reasonableness, persuasiveness and assurance.

2. Scope and depth of theme (subject) knowledge, erudition and interdisciplinary links.

3. Pedagogical orientation: culture of speech, behaviour, use of visual aids, sense of time, improvised basis, retention of audience attention.

4. Answers to the questions: completeness, reasonableness, persuasiveness and assurance, friendliness, intention to use answers for successful disclosure of the theme and strong points of the project.

5. Speaker’s professional aptitude and endurance and stamina: responsibility, pursuit of high results, readiness to discussion, ability to work overload, amiability, in-touch capabilities (Baklagova, 2018).

Individual student abilities are taken into account when choosing a project theme (high-achieving students take difficult themes, low-achieving ones take themes according to their abilities).

> Salikhova (2013) notes that: Dialogue is crucial for the designer specialist training process as an ability to describe your idea correctly, persuade the person you are talking to that your conclusions are logical and that the results are unquestionable. It is an important part of professional success of a graduate. (p. 6)

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So, during the development stage of the complex of criteria and methods of competence assessment of future designers we base on the holistic approach to the personality formation issue of the specialist who effectively and successfully carries out labour activities.

7. Conclusion

Summarizing the conducted research in the field of design education we can make a number of conclusions:

1. The conducted theoretical analysis proved current importance and insufficient development level in the pedagogical theory of the project skills formation problem of future design specialists in the system of higher professional education.
2. Project activity is the key one in the professional activity of the environment designer.
3. A specialist should obtain following professionally significant qualities for successful professional activity in the sphere of design of environmental objects (interiors, exteriors, small architectural forms): creativity, cognitive flexibility, logic, spatial thinking, communication skills and endurance and stamina.
4. An important part of the professional competence are professional skills and abilities - artistic, modelling, formation, analytical, research, graphical, computer, communication skills. These skills and abilities are directly connected with the professionally significant qualities.
5. An important factor of the successful implementation of the learning activity in the design sphere is the presence of the corresponding skills, their focus on the design activity, positive motivation and the desire to get a high-quality professional education. A set of these components tells us that a student is ready to get the professional education.
6. 1-2-year students studying a degree in "Design" are more likely to possess abilities to artistic (fine art) activity rather than design (project) activity.
7. Students' readiness level to the project activity heavily varies.
8. During the studying process:

- Interdisciplinary method of general educational and special disciplines that stimulates transfer of knowledge, skills and abilities between subjects and courses is absent.
- Students' abilities are not taken into account, individualization is absent;
- Absence of the creative environment that would stimulate students' motivation;
- Active methods are not included enough;
- There is no adequate assessment of the project activity results, students do not know criteria based on which their knowledge and projects will be evaluated.

9. The following pedagogical conditions are necessary for elimination of the previously stated deficits and more effective development of the professional project skills and abilities;

- organization of interdisciplinary training method which is based on the solution of professionally significant tasks - modular education system,
- formation of creative educational environment,
- inclusion of active teaching methods into the educational process,

- precise project activity assessment criteria.

This work does not cover all aspects of the problem at issue that indicates the need for its further development. However we believe that the represented research will help teachers to build optimal training process in attempt to form project activity skills.

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