

Development of students' creative skills through architectural workshops

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ABSTRACT: The article deals with the methods of developing creative thinking by students through architectural design in architectural workshops. Several resources and various approaches are required to achieve this goal, including the method of student-oriented, active training. The article outlines the most effective and proven methods of organising the educational process aimed at fostering student creativity through workshops. The effectiveness of these methods was successfully tested first with students of the Architecture and Construction Faculty of the L.N. Gumilyov Eurasian National University, and also with students studying in the Faculty of Architecture at Cracow University of Technology, Krakow, Poland. Encouraging students to choose independently the goals, objectives and means of solving a creative problem was found to be a necessary condition for the formation and development of creative independence. The characteristics of professional training are crucial elements in the process and, hence, they are briefly discussed in the article.

Keywords: Architectural workshops, architecture, architectural design, creative tasks, creative thinking development, training, architectural students

INTRODUCTION

In this article, the authors consider an approach to the organisation of an education process through architectural workshops with the aim of developing the creative independence of students majoring in architecture. They also discuss the concept of *creative independence* as an important factor in the professional competence of the future expert and identify its crucial characteristics. Moreover, the possible role of the teacher in the development of creative independence of students is outlined and analysed.

In modern society, enhanced cognitive abilities and highly developed creative skills are necessary requirements for expert-level professional competence. As well, there is a requirement for specific skills and continuous cultivation of creativity and innovation by the specialist working in the field of architecture. Creative independence is defined as the productive self-employment to:

- see and formulate the problem;
- make an accurate prediction;
- extend existing data to new conditions;
- find creative ways to solve the problem through independent work.

Education and improvement of students' creative potential takes place in the conditions of formation of independent activity (acquisition of complex scientific knowledge, methods of professional work, creative work experience). Student creative personality could be formed in the process of participation in architectural workshops. The process is aimed to form and develop students' ability to create something new: first to work intelligently and independently with the architectural material and, then, with scientific information. Besides, student participation in architectural workshops is the very foundation of self-organisation and self-education. Later, students will have a desire to improve their skills continuously. Taking part in architectural workshops gives students the opportunity to deepen their professional knowledge and skills to form and develop the creative component through the introduction to the principles and methods of engineering design, and in presentation of their ideas. To identify opportunities for organising a training workshop, the authors focus their attention on personality-oriented and activity approach, which in this study allow the resolution of the main task - creating conditions to form the creative independence of architecture students.

An active, student-oriented educational process allows the formation of the main facets of students' creative independence, like:

- Knowledge of creative activity methods manifested in the ability to apply different methods to activate creative thinking and imagination, flexible and constructive use of them in the process of educational and creative work;
- Possession of the self-employment forms and methods manifested in the ability to organise, plan, adjust and critically evaluate educational and creative activities;
- Understanding of the motives of educational and creative activities, including self-reflection by architecture students on their own system of values;
- Creative attitude and interest in future profession and orientation to achieve good results in it.

The formation and development of students' creative independence includes the following stages:

- Preparatory work - independent work under the guidance of a teacher;
- Partial creative activity - independent work in consultation with the teacher intervention;
- Independent creative activity by students.

The level of creative independence is determined by these component units: incentive (motivations of cognitive intellectual activity), informative (reference knowledge) and technical (forms and methods). The more experience the student has, the greater and more productive his or her creative thinking, the more diverse his or her action, the more freely and effectively the independent project work, the more meaningful the learning motives and interests. Gradual complication of creative and exploratory tasks, using works directed on real professional problems as a task will enhance creative thinking and increase the degree of independence and motivation of students.

A person-centred approach highlights orientation on the student's personality as the main criterion of efficiency to form creative independence. The person-centred approach in education involves a learning process in which the student is given a real opportunity to prove his or her individuality, to make their own personal actions, like: search, create, find, select, comprehend and recognise critical judgment.

Yefimov identifies the following components of creative independence:

- Cognitive-active (self-mastery of the creative techniques of project activities);
- Reflexive and creative (self-determination of student goals and methods of the project activity, self-improvement, a critical attitude, analysis and evaluation of the project's own activities and those of others);
- Motivational and personal (formed student motivation to master the techniques of independent creative design work) [1].

Considering psychological and pedagogical aspects of creative independence formation, the authors have developed an educational model of the creative independence formation based on Bondarevskaya: *...the pedagogical model - is a model of pedagogical activity, which presents the idea of the expected outcome, defined its meaning, given the characteristics of means and conditions that are necessary for the realization of the expected results, and specified activities subjects* [2]. This definition allowed the following set up of interconnected blocks:

- Target unit (purpose, principles, conditions for organisation of the creative workshop process, characteristics of creative independence components in accordance with the project activities);
- Meaningful unit - determination of the direction of educational activity to form and develop creative independence;
- Engineering and organisational unit - methods of organising and stimulating creative activity, methods of monitoring and evaluation of creative activity, and ways of organising learning activities of students;
- Procedural and active unit represented by the organisation of educational and project activities, and tasks corresponding to teacher and student activities;
- Scoring unit - defined set of skills and abilities that need to become indicators of creative independence formation of students.

TESTING OF THE MODEL AND FURTHER CONSIDERATIONS

This model has been successfully tested in the Eurasian National University named after L.N. Gumilyov in Astana, Kazakhstan. To confirm the efficiency of the developed pedagogical model, an experimental work plan has been developed. In order to measure the level of creative independence formation of architecture students, a three-level scale has been adopted. Each level included research data on the following aspects:

- Creative thinking;
- Knowing methods of creativity and heuristics (cognitive and active component);
- Skills in organisation of independent educational creative activity - organisation, planning, correction and critical evaluation (reflexive-creative component);
- Motives of educational creative activities (creative motivational component).

The authors have carried out experimental work that identified and confirmed the complex of pedagogical conditions that determine the effectiveness of formation and development of creative independence of architecture students, like:

- Updating of personal experience and creative intuition of students;
- Introduction of students in actual professional activity;
- Stimulation of creative thinking, self-activity and self-search of students.

Transition from the traditional model of knowledge *accumulation* to *lifelong learning* can be challenging, but it is necessary to increase the scientific potential of society. Most modern professions involve partition in the scientific research. Young professionals are required to be ready for continuous self-education and the implementation of creative ideas. Accordingly, it has been recognised that one of the most important components of training qualified specialists is to develop their creativity and independence. So, *creative independence* is becoming increasingly relevant in the framework of the educational space.

Creative independence, according to Lerner, is the desire to use new methods in solving the problem, looking for ways to overcome the difficulties, the need to introduce elements of novelty in the task execution process [3].

The development of creative independence of the future expert is directly related to training. Consequently, the student-oriented educational process in general, and the creative workshop in particular, are both the demands and methods for the development of creative independence of architecture students. Also, it would be difficult to imagine the process of creative independence development without the participation of the teacher as a crucial force of educational activity.

It should be noted that the purpose of teachers *in the discussed model* is very different from their function in the traditional classroom approach. The teacher's task is to find alternative methods of working with students and consider the following roles:

- Teacher-facilitator;
- Teacher-adviser;
- Teacher-moderator;
- Teacher-tutor;
- Teacher-coach.

The teacher-facilitator provides educational assistance and non-mandatory support, which encourages students to realise their ideas. Such non-directional influence of the teacher on students, changes their mental activity and, in particular, increases the level of creativity. The teacher-facilitator puts students in the position of assistants, in search of joint solutions, giving students complete freedom of action.

The teacher-adviser provides training through counselling in real time and remotely. The nature of the adviser is in activities aimed to solve a specific problem. The adviser either knows a prepared solution that can be offered or has activities, which point the way to solving the problem. The main purpose of the teacher in this model of training is to teach students to learn.

The teacher-moderator implements activities aimed at disclosing the potential and abilities of the student. The main task of the teacher is to organise the process of free communication, the result of which will be making the decision. The main methods of the moderator are those, which are based on the motivating students to the activity, the organisation of the discussion process, creating an atmosphere of cooperation.

The teacher-tutor provides educational support for students, developing a task to perform in the group and organises group discussions of any problems. Tutor-teachers are assigned to work with a personal experience of the student. The teacher analyses the cognitive interests, needs, personal aspirations of each, develops special exercises and assignments based on modern communication methods, personal and group support, defines ways to motivate students and fixing achievements, chooses directions of activities.

The teacher-coach helps students to pass certain training courses in preparation for public speaking at seminars, presentations and reports on the training and later conferences.

So, there are a number of professional teacher roles, each of them with a certain set of characteristics. All of the above roles contribute to the development of the creative independence of students, including the ability to make decisions in the course of self-employment, developing internal capabilities, and increasing initiative, teamwork and public speaking skills.

The authors consider the process of creative independence development as one of the more important aspects in the process of architectural workshops. The ultimate result is to identify hidden opportunities for students, including the ability to solve non-standard tasks and the manifestation of a creative approach to solving them, willingness to engage in continuous self-education, and a high level of adaptability and professional mobility.

But, one of the important conditions for the effective development of creative skills and independence of architecture students during the architectural workshops is a unique approach to applying knowledge by the teacher. The teacher focused on preparing successful professionals must work in a modern pedagogical environment, where carrying out research work with students require mastery of innovation, design, communication and other activities.

After 1955 in the Soviet areas of influence, the architect profession was dominated by typical solutions in architecture. This model did not need the process of creative search for unusual architectural solutions, and everywhere there were buildings, neighbourhoods and whole cities, completely similar to each other. This urban development still exists in the post-Soviet area, *because architecture is created for several generations*. This old urban environment does not meet the modern preferences of the resident population. Hence today, the most important question is to educate an extraordinary thinking student in innovative schools. To realise this goal, several methods and tools, such as architectural workshops in the context of vocational training or analysis of the current experience of design and construction are needed, so that architects create a truly comfortable, sustainable environment and aesthetically pleasing environment for future generations. It is obvious that the design cannot exist without the creative thinking of the architect [4].

Creating a comfortable environment for living builds on linking various functional areas, architectural images, life styles for people and urban space are just some aspects of architectural design. Quality architectural education takes an important role in modern society, especially in the implementation of priority government programmes, since many of them require a creative approach in the formation of architectural and urban design. Based on the above, the main purpose of university education has been identified - education of specialists able to think freely, to analyse, to make informed decisions and be competitive [5].

Equally important for achieving this goal is an educational programme of the L.N. Gumilyov Eurasian National University, developed at the Department of Architecture, which is focused on quality education for students. It covers the training of Bachelor's and Master's programmes in architecture. These programmes aim to prepare graduates that are able to deal effectively with current creative (both theoretical and practical) and innovative tasks of modern architecture and urban planning objectives. During the studies, students acquire relevant knowledge, practical experience and develop their creative potential, reflected in the personal relation to architectural practice, ability to create architectural images, understanding of technical documentation and methods of architectural design, ability to work with modern equipment and to create a new architecture product. All in all, the formation of students' creative thinking occurs in the classroom, where they are engaged in creative tasks, and based on design methods, they form spatial compositions [6].

The organisation of architectural workshops occupies an important place in the training process. As a result of training by experts, students acquire new skills that contribute to the development of their imagination and creative thinking [7]. During the training, students learn architectural skills and raise the level of architectural graphic skills. It results in the creative component, which rests in the mastering of professional disciplines through workshops and architectural seminars.

Starting in their second year, the students independently design urban objects, they work with the so-called *human* scale, and model buildings' tectonics. Subsequently, each course project is a creative task, and is divided into different stages. As the implementation of exchange projects and design of objects on a given topic, it can be said that students evolve from a sketch, conceptual layout to the actual projected object. Besides mastering the basic programme of education, the important point is students' participation in conferences, creative competitions, seminars, which undoubtedly enhances creative thinking and helps acquire useful skills, such as teamwork and the ability to make decisions, all of which is extremely important in their future professional work.

During the first and second year, the students work in a manual mode. In the third-year, the students use computer software that greatly expands their ability to design and allows them to put into practice the most innovative creative thoughts. Teachers give students short-term assignments, the purpose of which is to enable the students to be creative, to think and, in a short time, to make a decision independently about their concept and project.

In the fourth year, students apply all the knowledge and skills previously obtained for the independent solution of architectural problems. In the fourth and fifth year, the students take a professional practice in the enterprise, where they can share experiences with senior colleagues-architects. The result of training is to prepare for degree designing. When presenting the degree project, students fully show themselves as expert architects able to think creatively.

The formation of creative thinking in the training process requires several corresponding conditions:

- creative relation of the teacher to a subject;
- creation of a favourable psychological atmosphere in the working environment;
- implementation of creative tasks (sketching, conceptual prototyping);
- individual approach to each student; individual consultations;
- student involvement in research activities - reports and paper presentations at scientific and professional conferences, architectural seminars, exhibitions and tender processes [8].

There is no doubt that successful development of student creative thinking mostly depends on the teacher giving the favourable motivation necessary to stimulate student creative thinking; the teacher's responsiveness and style of communication based on pedagogical cooperation also play a crucial role. Such an approach creates a capability to self-development and cultivates diligence, and increases positive emotionality, persistence, focus, attentiveness, and so on.

Architectural creativity is full of new opportunities, where creative activities are open for changes and developments. In training the specialist in the architectural field, the first step is a preparation for creative specialty, which is an indispensable condition in searching for, and adopting of, non-standard decisions [9]. Creativity can be brought in by any type of activity. For students of architectural specialties, manifestation of creativity is necessary in all types of their training. An architectural seminar is a didactic way of activating cognitive ability, developing creativity and, at the same time, forming certain personal competences, both in the teacher and students. The workshops during architectural seminars give opportunities for the development of productive interaction between the teacher and student based on the principles of creative cooperation.

Depending on the nature of student cognitive abilities, the following methods might be applied in problem-solving and research.

The pedagogical conditions promoting successful development of creative potential of future specialists in the field of architecture are:

- Creative potential is considered a foundation of professional capability. It can help to combine tradition and innovation in order to create balance between existing design rules and new technologies;
- Future architects need to be efficient in self-development from a line item of their orientation to assimilation of experience of practical activities by means of the organisation of developing environment, that is training taking into account regional components (for example, natural features of the Astrakhan region) giving unrestricted opportunities for a non-standard approach to designing, also to architectural creativity;
- Access to art space necessary for creative self-realisation of the identity of future specialist, including participation in the competitions for the best project held at different levels;
- Training special skills (drawing, painting and architectural design consisted of electing colours and spatial composition);
- Mastering computer graphics as an effective tool of thoughts and ideas;
- Availability of hardware;
- Availability of highly professional personnel (each teacher is a head of creative workshops);
- Connection with leading project organisations able to identify the uniqueness of future architects;
- Availability of the development model of creative potential of future architects in the process of professional training [3].

Andreyev notes the ownership of figurative language of architecture as arts; availability of original imagination; the developed feeling of plasticity and rhythm; composite thinking as specific features of creativity without which it is impossible to work as an architect [10]. The development of the creative potential of future architects by participation in creative architectural seminars will allow them to improve their future professional activity, in opposition to old fashion models and stereotypes that restrain creativity and cause psychological inertia and absence of extraordinary ideas.

Metlenkov and Stepanov outline the purpose and development of creative capabilities by students in the course of a seminar that stimulated their motivation to engage in creative activities and search for solutions [11]. Problems are solved by a *plane composition from geometrical figures* (associations on the set subject); *terrain composition* (transition from the plane image to volume); *volume spatial prototype on preserving and destruction of amount*; *composition from one sheet of paper*; *monuments of world architecture* (stylisation); poster *World Architecture* (application, collage). Design tasks have been integrated, which disclosed regularities of interrelation graphic and architectural creativity, volume and spatial composition, scientific knowledge, knowledge of history of arts and architecture for professional training of future architects [12].

A practical task for students of the first year of training at a seminar: *Relief Composition on Work of Master*, was analysed. The students were aware of the general history of art as they studied a number of artists of the 20th Century both domestic and foreign; they were taught about various types of paintings and styles of artists. During the course, they were not only redrawing the best works, but also participated in difficult analytical work. Future architects try to understand the artist's plan, to study the master's manner, to analyse composition, to repeat colour scale. At first, the students drew several versions, they sketched the compositions from geometrical figures and took inspiration from the work of 20th Century artists [13]. Further, they carried out a colour scale (monochrome, in colour of *master*, warm, cold). Then, the students transferred the composition to the bigger scale. Here are listed several implementation stages of this task in the style of the master:

- Accomplishment of stylisation of composition - work of the artist;
- Accomplishment of stylisation in colour scale of the artist;
- Accomplishment of stylisation in monochrome scale (an extension in five - seven gradation);
- Whatman paper;
- Accomplishment of a colour relief in colour of the master;

- Execution of a relief to monochrome gamma - material on an A0 paper;
- Execution of a colour relief in colour of the master.

Decisive accents in operation design of a project were reflected in all stages of the job: from operation of the master to a relief, including a figure stylisation work of the master, the colour sketch, the monochrome sketch, a font text with the name of the artist and the name of the pattern; at will - colour scales - extensions, design colour background of a project. In this approach, a directivity of efforts of the teacher (consultant) was usual. His/her attention concentrated on the competence for which they trained, performing work in the *Spirit of the Master*.

These competencies included standard skills in the field of the following subjects: model making, painting, architectural colouring, simulation, universal history of arts; but while working on the project, students were also finding information, focusing on a specific goal necessary for their achievement (reading books, involvement in seminars, preparation of presentations, using the Internet); they have developed ingenuity, ability to represent the operation, and several practical skills [14].

The presented task facilitated the studying of style, equipment and the works of artists of the 20th Century. It began students' development, and increased their artistic and graphic skills. When performing the tasks, the students were trained in: independent critical thinking, ability to work with information; reflection, relying on knowledge of the facts, regularities of science, drawing valid conclusions; making independent reasoned decisions.

Development of creative abilities through architectural seminars demands a combination of conditions and factors. One of the necessary conditions for development of creative abilities is a variety of forms and types of activity. Art brings up creativity, and in this function nothing can replace it. Creative abilities are first of all the ability of the person to find a special view of habitual and daily things or tasks. The use of methods of active training by means of architectural seminars in the educational process allows for the influence of the quality of understanding of the material more effectively:

- Maximum approach of a training material or professional activity;
- Motivation impact of training is amplified.

Active training establishes the use of methods, which are directed to improve knowledge and abilities in the course of vigorous cognitive and practical activities. Methods of active training include the progressive beginning for personal orientation, promoting active involvement, and training in cogitative and behavioural activity for creative and search tasks in architectural seminars. Creative and search tasks have been shown to contribute significantly to the formation of professional capabilities: to the development of creative potential, identity, hallmarks, capability to generate new ideas, capability to increase knowledge transfer and developing abilities in new situations [15].

It is possible to allocate the following conditions necessary for the development of creative skills: engagement of students in creative search activities and in the educational process on various level of creativity; development of thinking system; training of methodology of architectural creativity by means of inclusion in educational process of thematic rates [2]. Realisation of the above conditions in the course of training at an architectural seminar is directed to help students study the creative process *from within*, to provide them with mechanisms, methods and instruments of conscious management of the creative process [16].

Extra value during the development of creative skills depends on the identity of the teacher as there are activities transferred through experience, expressed in the teacher's attitude and behaviour. Effectiveness of such interactions is related to individual impact [17]. The key value is the creative approach of the teacher, a personal example in the solution of non-standard architectural problems. Disterveg claimed: *...The bad teacher presents truth, and the good - teaches how to find it*. Therefore, in the course of a seminar it is necessary to organise such educational and creative activities in which students become active participants in the process of knowledge acquisition [18].

The awaking of creative activities requires implementation of a technique of figurative approach, containing heuristic potential in the educational process. This technique is an integral part of educational and creative work of students; it stimulates new ideas and acts as a source of student inspiration. Heuristic methods are a system of activity rules of the teacher (teaching methods) and activities of the pupil (doctrine methods) developed by taking into account regularities and the principles of pedagogical management and self-government [3].

It is possible to select two main characteristics of heuristic methods: the targeting function on the correct decision and the reducing function of options in the case of search for possible solutions [19].

A future specialist architect should be able to perceive the world through the eyes of the artist, thinker, researcher and creator; to see in each object, at the same time, the specific and general aspects; to express their own thoughts and the language of project activities; and to avoid a sample approach in professional activity. The formation of creative thinking includes, at the same time, the development of such qualities of thought processes as flexibility that allows the development of non-standard, original ideas [20].

It is also necessary to note that active methods of training at architectural seminars are under construction on a motivational basis. Without the real-life purpose accepted at the level of the leading motive, the methods of development of creative thinking turn into informative stereotypes, which remain unclaimed. An analysis of problem-causing conditions at the formation and development of creative independence of architecture students has shown that when defining methods of the organisation of training it is necessary to consider:

- Purposes of training and the assimilation of training contents or study material. A set of methods has to lead to the achievement of the objectives of particular training [2];
- Psychological justification of approaches to the selection of methods provided by stage-by-stage formation of intellectual actions. There should be an attempt to define a system of the following reference points, which assimilation methods have to provide: a set of scientific knowledge points, ways of activity, experience of creative activity;
- Training - interaction between the teacher and student, none of the methods should be feasible without conscious, purposeful activity both by the teacher and the trainee. The methods of training define the activities of the teacher, his/her ability to apply various methods of training. The method of training is a system of consecutive actions by the teacher that organise the cognitive and practical activities of the pupil, which are steadily leading to the assimilation of contents by education i.e. to the achievement of the training objectives [17];
- Methods of training have to consider the nature of organised cognitive activity and the level to be reached through independent training.

Determination of the personal status is important for higher education teachers in modern society. It should proceed from a set of steady motives and spirited purposes of personality development on the basis of requirements and values which, then, are demonstrated in teaching activities. In general, public opinion about the role of the teacher-architect assumes creative orientation in activities that is a reflection of the orientation towards scientific and educational activities.

Today, it is extremely important to study issues that emerge in high school and school curriculum, which should be directed towards the formation of the creative thinking of future architects, later realised in higher educational institutions. Thus, the creative independence of architecture students is a difficult structure of conscious actions on the basis of sound motives for method development and the methods of independent activities.

METHOD EFFICIENCY AT THE EUROASIAN NATIONAL UNIVERSITY

The effectiveness of the described methods was successfully tested in the course of architectural seminars, first with students of the Architecture and Construction Faculty of the L.N. Gumilyov Eurasian National University and also with students studying in the Faculty of Architecture at Cracow University of Technology, Kraków, Poland. During the testing, the following set of pedagogical issues and conditions has been revealed:

- The importance of professional and practical orientation of holding architectural seminars;
- Activity-oriented approaches to the organisation of personal educational process (gradual increase in complexity of the studied material, defined order of task creation, use of technologies of activating creative thinking, own activity and independent search by students, creation of the environment of dialogical interaction of subjects in the educational and creative process);
- Introduction of teamwork to the educational process, methods of activation and stimulation of independent creative activity, and also control methods and assessment of creative activity adequate to the components of creative independence.

The application of the described methods, and specifically the organisation of architectural seminars, confirmed their usefulness and efficiency in the formation and development of creative independence of students. The participating students demonstrated the following indicators of creative independence:

- Knowledge of methods of creative activity that shows their ability to apply various methods of activation of creative thinking and imagination, constructive and flexible application of it during educational and creative work;
- Ability to handle forms and methods of independent activity, which shows their ability to organise, plan, correct and to critically evaluate educational and creative activity;
- Existence of corresponding motives of educational and creative activity.

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BIOGRAPHIES



Professor Sara Sadykova is Head of the Department of Architecture, L.N. Gumilyov Eurasian National University. She has had considerable practical experience in architecture, as well as research and educational experience in academia. She worked as an architect in Oskemen and Almaty from 1982 to 1994. She is recognised as an Honorary Architect of the Republic of Kazakhstan and a member of the Union of Architects and the Union of Urban Planners. From 1994 to 2000, she lectured in the Kazakh Leading Academy of Architecture and Civil Engineering in Almaty. Since 2001, she has been lecturing at the L.N. Gumilyov Eurasian National University in Astana. In December 2014, she delivered a series of lectures for students at the Faculty of Architecture at Cracow University of Technology in Kraków, Poland, as a Visiting Professor. In 1998, she became a Professor and, then, Head of the Department of Architecture in Eurasian National University in Astana. Prof. Sadykova is the

author of several textbooks and monographs, and has more than 100 scientific publications on the history and modern development of architecture in Kazakhstan, including publications in prestigious journals.



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