

Using Social Interaction to Invert the Professional Competencies of Future Architects

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Abstract: The article analyzes the results of a sociological study of the role of public and interdisciplinary communications for formation and inversion of architect's competences. The study was carried out in 2021-2022 among students of architecture departments in Russia. About 3,000 students of the Moscow Architectural Institute (State Academy) and the Orel State University took part in the study. As a result of processing the data of the written questionnaire with correlation relationships, the potential of "external" educational communications was identified for acquisition of new professional knowledge and competencies in architecture; popularization of socially important ideas in architecture and spatial development; raising a sense of pride and respect for urban historical and cultural heritage; enhancing the prestige of the architectural profession and the status of architectural education; understanding social expectations of architectural activities and factors limiting implementation of projects; identifying factors influencing formation of strategies for the development of architectural education. Four stages of formation and inversion of professional competences in the educational process were singled out: 1st-2nd years of training—an "orientation period"; 3rd-4th years—the level of Bachelor of Science in Architecture, at which the groundwork of the professional thinking basics is laid—a stage of mastering the basic system-design skills; 5th year (diploma thesis)—a stage of entry into creative practice; training at the level of Master of Science in Architecture—scientific-design practice in architecture. Issues concerning underrating the importance of future architects' involvement in joint activities with community and engineering professions representatives to realize the goals of sustainable development were identified; late awareness of the value of participation in volunteer programs.

Key words: Architectural education, social interaction in architecture, forms of educational communication, inversion of professional competencies, student survey.

1. Introduction

The importance of studying the effectiveness of different forms of public and interdisciplinary communication in architecture in the professional training of architects is determined by the following reasons:

- The exponential growth of engineering and technical innovations and the need to search for new methods of their evaluation and selection with their subsequent introduction in educational and architectural practice;
- The necessity of selecting the optimal forms of educational communications to provide social and interdisciplinary evaluation of future architects'

professional training results.

The research is targeted at identifying means to find effective forms of educational communication between the internal and external environment of architectural schools that contribute to the acquisition and inversion of professional competencies of the architect. Study objectives:

- To identify effective forms of external educational communications by applying the international practice of training architects in the leading architectural schools of the world;
- to classify them and determine goals, interrelationships, composition of participants, didactic characteristics;
- to conduct a sociological survey of Bachelor's and Master's level architecture students to find their perceptions of the effectiveness of various forms of

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educational communications for the acquisition of professional competencies;

- Using the analysis of the obtained data to define the principles of inversion of the system of educational communication forms in architecture during the course of professional training at the “Bachelor” and “Master” levels of architecture.

2. Research Methods and Techniques

To achieve the first objective, we make a comparative ratings analysis of architectural schools of the world, an analysis of literary sources and data from official websites of universities;

When compiling the questionnaires for a written survey of students, an analysis of the educational standards of the Russian Federation in the direction of "Architecture" was used (levels "Bachelor" and "Master"); mathematical methods were used to process the statistics.

In order to achieve the third goal, scientific methods of comparative analysis and synthesis of new knowledge are used.

In studying the forms of educational communications with the external environment we used the experience of architectural schools of the world with different strategic lines: schools and faculties of architecture, focused on participation in the solution of global and national problems (Harvard University School of Architecture (USA), Cambridge (UK), Qin Hua (China), Queensland (Canada) and others); creation and practical application of engineering and technological innovations for sustainable development (Massachusetts Institute of Technology (USA), Delft Institute of Technology (Netherlands), Chalmers University (Sweden), and others); spreading knowledge and advancing culture in society (Cooper Union (USA), the Art Colleges of Edinburgh and Glasgow (Scotland), and others); improving architects' professional skills (the Architectural Association School of Architecture in London (UK), Moscow Architectural Institute (Russia))

[1]. The study identified the most common forms of educational communications, with different didactic approaches and cognitive psychology: (1) an interactive lecture, master class, discussion about architecture; (2) design competitions and their public discussion; (3) public exhibitions (competitions) and discussions of architectural drawings; (4) joint research activities with representatives of community or related professions (master classes, focus groups, business games, etc.); (5) volunteer projects.

Heritage sites and buildings are studied to learn about the design methods of outstanding architects, so, along with the subject-subject communications the importance of subject-medium communications [2] was evaluated and thereby assessed. The questionnaire did not include subject-medium communications between representatives of the engineering and construction professions occurring in the process of joint scientific and educational interaction at adaptive architectural sites, due to the lack of such practices in Russian universities.

The questionnaire matrix included questions reflecting the requirements of the educational standard (Bachelor and Master levels of “Architecture”) for the presence of general cultural, general professional and professional competencies in certain forms of educational communications.

The study hypothesis assumed that there is a correlation between the stage of professional training in architectural design and related disciplines and the effectiveness of certain forms of external communications for acquisition of professional competencies. Forms of scientific and educational communications were assessed by the respondents in terms of their effectiveness for formation and inversion of general cultural, general professional and professional competencies:

(1) Did this event help you in the search for new spatial forms and methods of representation (presentation) of design solutions (general cultural and design)?

(2) Did it help you to fully analyze the project situation from different perspectives and perform preliminary design studies?

(3) Did it encourage the familiarity and use of new engineering and technological developments in training design?

(4) Did the event contribute to your understanding of the artistic, aesthetic, environmental and other preferences of modern society?

(5) Did this lead to an awareness of the artistic, structural, functional, investment, environmental and other parameters of the architectural design?

(6) Did it help you determine the focus of your professional interests and the line of your future professional development?

(7) Did the event help you determine the level of credibility of your scientific hypotheses and research results?

The research methodology was tested and evaluated

at the 12th International Conference on Sustainable Development and Planning in June 2022.

3. Study Results

About 300 Bachelor's and Master's degree students of the Moscow Architectural Institute and the Faculty of Architecture of the Oryol State Institute took part in a written questionnaire survey. The results were collected and the obtained data were processed using mathematical methods. Based on the calculations of the average grades for the levels of training, the average grades for all criteria and for each type of activity were identified. The comparative analysis allowed us to draw conclusions about the preference for the use of forms of social and interdisciplinary interaction and different stages of learning architecture and the direction of improving the methods of teaching architecture.

Figs. 1-5 present the research results.

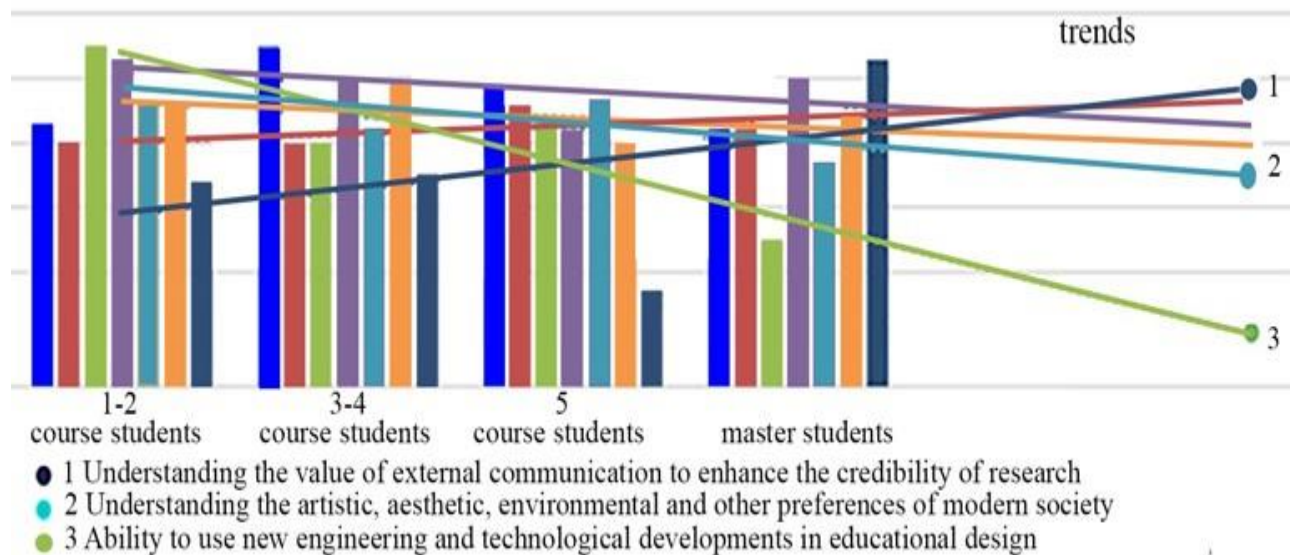


Fig. 1 The value of interactivity of public lectures, master classes, discussions about architecture for the formation and inversion of architect's competences.

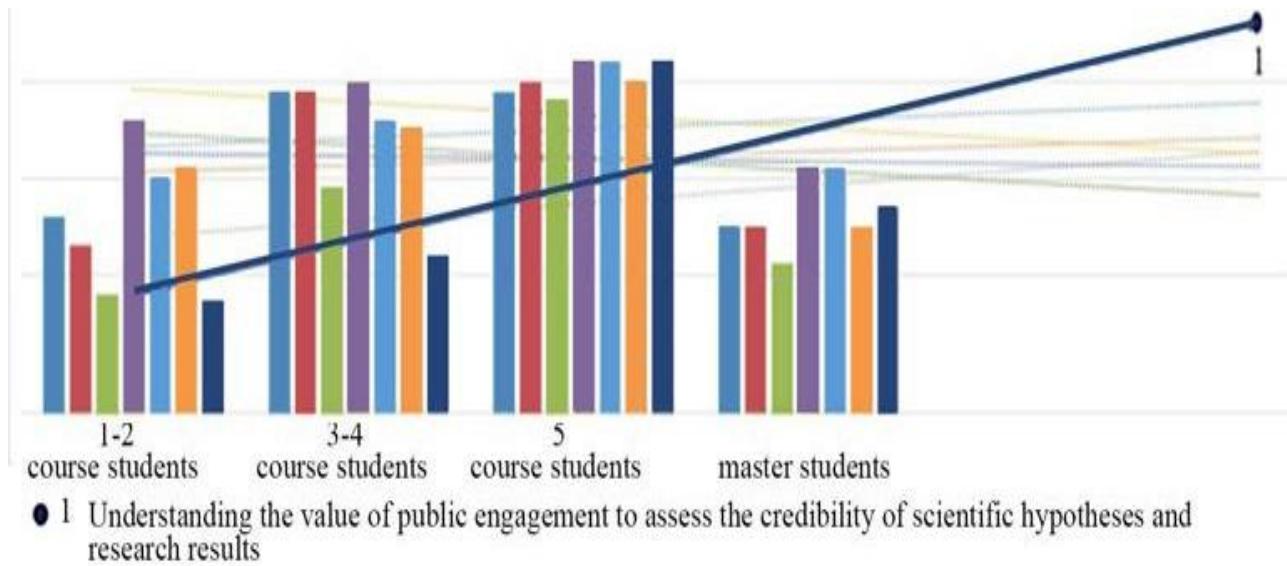


Fig. 2 The value of project exhibitions and design competitions and their public discussion in the process of social interaction.

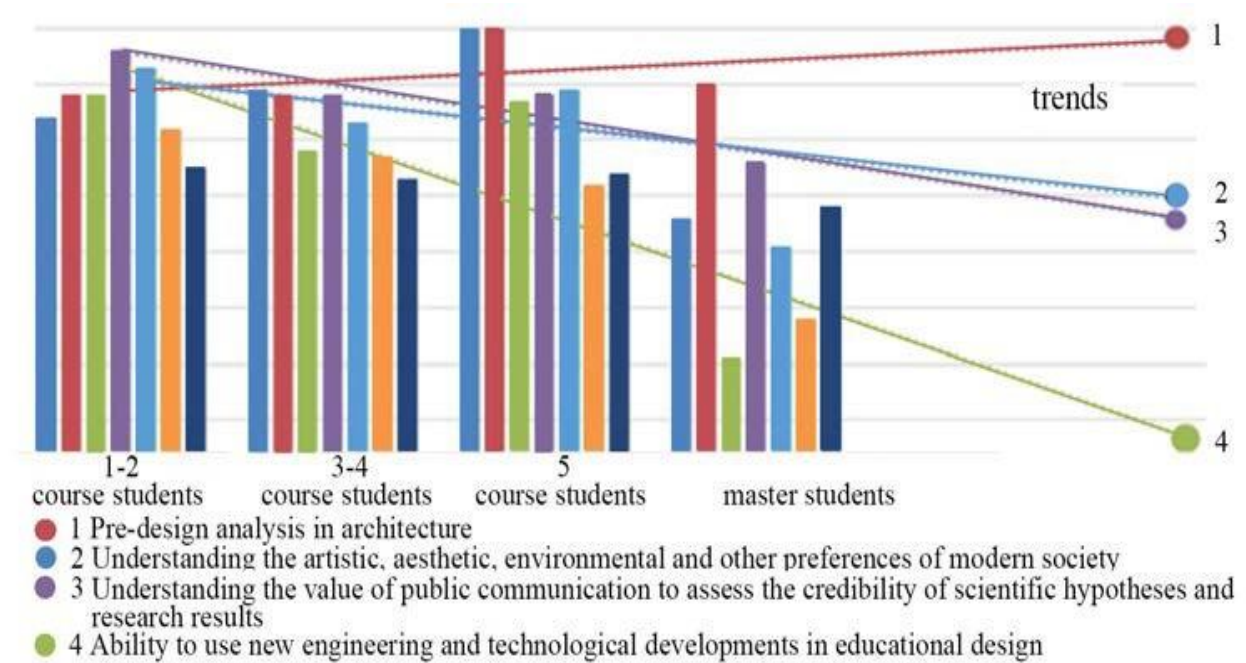


Fig. 3 The value of architectural drawing exhibitions and competitions and their public discussion.

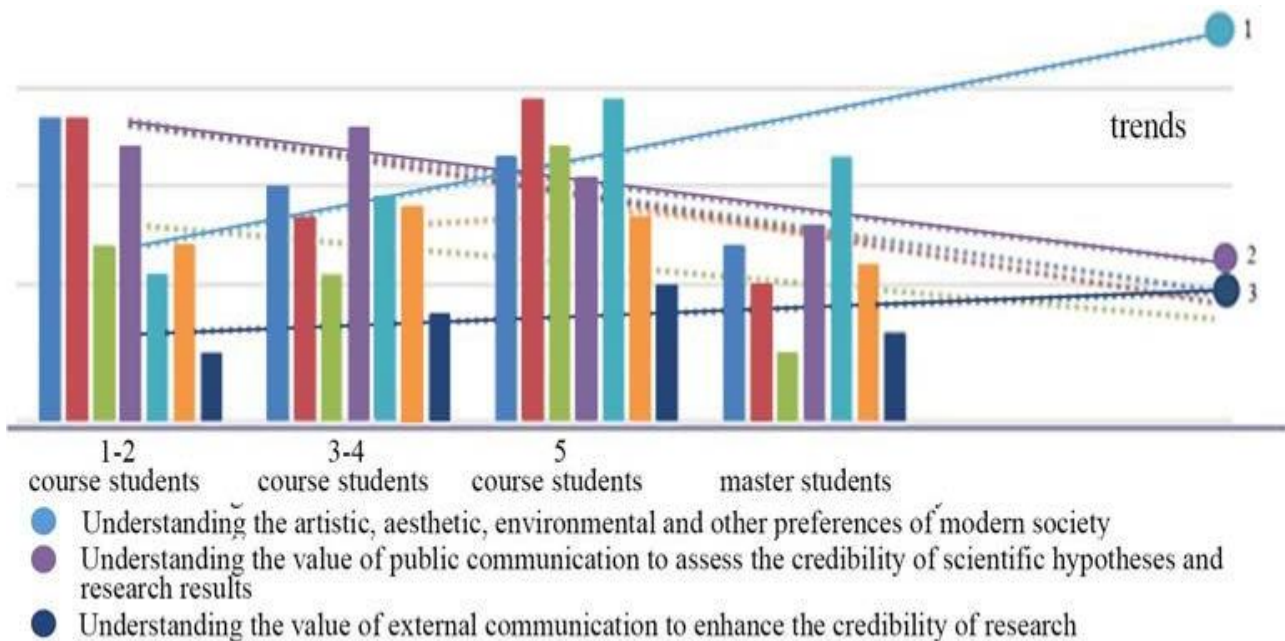


Fig. 4 The value of scientific and educational interaction with society and representatives of related professions (engineers, technologists, lawyers, economists, etc.)

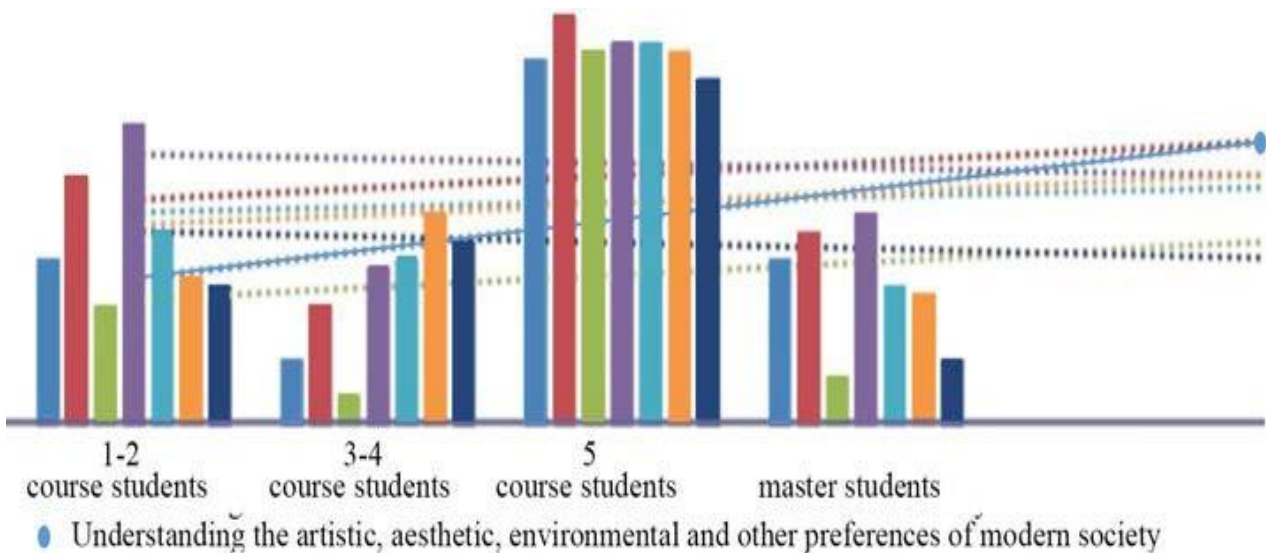


Fig. 5 The value of participation in volunteer projects for the formation and inversion of professional competencies.

4. The Trends of Changing the Value of Forms of Communication

The trends of changing the value of forms of communication for students are obvious.

4.1 Interactive Public Lecture, Master Class, Discussion about Architecture

These include various public lectures, with

interactive lectures with guest speakers and participants [3]. Their advantages include the absence of competitiveness, the opportunity to ask a clarifying question, to express their opinion and to hear the opinion of other participants. Participation in lectures, when a listener absorbs the professional experience of a lecturer and participates in the discussion of the problem with other participants, according to cognitive psychologists, encourages generation of new ideas

using lateral thinking [4]. This stage can be considered a preparatory one for the creative process. The cognitive limitations of lectures can include their theoretical nature, the emphasis on verbal and visual perception of information, and the impossibility to test the conclusions practically. Public lectures are used to popularize and promote new public ideas and to involve participants, including architects, in their implementation. They are widely practiced by Western European and North American schools of architecture focused on participation in national development programs. It seems logical to involve future architects in the process of exchanging views and developing solutions for the implementation of new social initiatives. Public discussion can change the initial project design developed through existing professional competencies. Critical and creative students, using public opinion and information from related professionals, are able to invert existing experiences and professional competencies.

4.2 Exhibitions of Projects and Design Competitions with Public Discussion

Exhibition of projects and design competitions with public discussion of the results is a traditional method for architectural schools to develop a standard of design solutions and its individual characteristics (artistic, stylistic, design, environmental, technological, and economic). A student has an opportunity to compare his solution with the best one and to identify leading design trends. The public discussion and evaluation of project competitions correspond to the positivist approach to the evaluation of the creative products, and the structure of the competition committee (jury) is vitally important in this aspect. The structure, diversity of professional experience and competencies of the jury members guarantee a comprehensive review and credibility of the results. The risks of public evaluation of project competitions are the conflict of local and global interests of the community, the use of manipulative techniques in

public discussion. The threat of authoritarianism, conservatism and narrow-mindedness reduce objectivity of the jury assessments [5].

An architectural drawing is a traditional form of professional communication, used to visualize the architectural design, studying the experience of predecessors.

4.3 Exhibitions (Competitions) of Architectural Drawings

Exhibitions (competitions) of architectural drawings with their public discussion are one of the types of architectural competitions, which demonstrate and evaluate the artistic and graphic skills of architecture. Architectural drawing competitions are an element of the architect's corporate culture, and represent a social and cultural event, a coverage opportunity for the popularization of architecture in society. It is worth noting the trend of expanding the means of artistic visualization of architecture.

4.4 Scientific and Educational Activities

Scientific and educational activities were held by future architects together with community members and representatives of related professions (engineers, technologists, lawyers, economists, etc.). These include focus groups, expert surveys, questionnaires, brainstorming and other methods for generating and evaluating new ideas. The scope of their applicability for the formation and inversion of professional competencies is wide. It includes the competences that make up the expert-critical skills and the ability to carry out scientific and design innovation activities (teaching design activities at the Bachelor and Master's levels of "architecture").

4.5 Volunteer Projects

Volunteer projects provide psychological and pedagogical resources for personal and professional development, contribute to the acquiring of life and professional experience, formation of social capital and

general cultural competencies. They are developed in student-initiated community projects, supporting programs for implementing the goals of a sustainable spatial environment. Their cognitive value has a creative-innovative, research, action-oriented and personality-oriented character. The diversity of manifestation of individual abilities in the selection of the focus of professional and social activity of future architects in volunteer projects points to the personality-oriented approach of this form of educational communication [6, 7]. Initiated volunteer projects in architecture are helpful in exposing new challenges in the urban environment and finding new applications of architect's professional competences. Volunteer programs of higher schools of architecture are implemented in universities with a socially oriented development strategy and are involved in the development of leadership qualities, motivation of volunteers to take a leadership position in the projects initiated by them and, as a result, the formation and inversion of managerial competencies. The analysis of self-reflection of students participating as implementers in volunteer projects showed an improvement in supra-disciplinary competencies, such as an ability to work in a team, awareness of the needs of people and society, an ability to find a way out of difficult situations.

Regrettably, students recognize the social significance of volunteer projects and the opportunity to demonstrate personal abilities only during their thesis project (5th year of the Bachelor's Degree).

5. Conclusions

The results of the study display two trends.

Educational communicative situations involving external public and based on interdisciplinary approach to the selection of the structure of participants situations, facilitate the inversion of professional competencies at all stages of professional training of future architects.

We can identify four groups of communicative situations, which differ in the composition of the

priority forms of communication:

1st-2nd years—situations of comprehension and awareness of the goals and means of architectural activity, occurring in the process of public and interdisciplinary interaction during public lectures, exhibitions of architectural drawing, practical training in measurement;

3rd-4th years—situations of development of a creative idea as a product of co-creativity with representatives of related architectural and construction specialties and society, taking place in various forms of educational communications, most successfully implemented in situations of interaction with engineering specialties;

5th year of the “Bachelor's Degree” (diploma theses)—situations of manifestation of project-creative independence, supported, to a greater extent, by community-creative (volunteer) projects;

“Masters”—situations of scientific and creative autonomy in which the main task of social and interdisciplinary interaction is pre-project scientific research while the significance of exhibitions of architectural projects and drawings is dramatically diminished.

The prevailing trends in the use of educational communications for formation and inversion of professional competencies are:

Use of results and lines of development and research:

- development of a program of additional education to help organize pre-project research for architecture students and graduates in the context of public communication and interdisciplinary approach, considering the differences in the development strategies of universities and architectural academies;
- development of a comprehensive model of socio-communicative situations based on a variety of forms and communication approaches in architecture: “theatricalized”, personified, creative-competitive, artistic-presentational, sociocultural, socio-economic, socio-creative;

- development of a system of measures for the formation and inversion of the architect's professional competencies in sociocultural and interdisciplinary educational environments in the system of continuing architectural education.

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