Conference Paper

Design Research as a Discipline: Understanding the Present and Predicting the Future

Elmira Khalmurzayeva

Associate Professor, Department of Design, Institute of Innovative Professions, Kyrgyz State University of Construction, Transport and Architecture, Bishkek, Kyrgyz Republic

Abstract

This article examines the role of design research in contemporary design education for master's level students. The author discusses the general role of design research in the development of modern design and argues that for today's design professionals good grounding in research during the training period is indispensable. Teaching design research for master's level students means introducing them to one of the key skills in developing innovations. The article presents experience of teaching design research for students at a master's level design educational program in Kyrgyzstan. Combining the best international approaches, design research was introduced as one of the central components of the new educational programs. Several courses teach students major trends and tools in design research, allowing them to expand their horizons and to bridge the gap between theoretical and practical knowledge. It is to be hoped that future development of this programme will produce ground-breaking results in local design education.

Keywords: design research, design research methods, innovation development.

Corresponding Author:
Elmira Khalmurzayeva
idea-e@list.ru

1. Introduction

In modern global design discourse [1] design research is an actively developed field. Being a relatively young discipline, it has become an integral part of design theory and practice [2]. There are specialized journals (i.e. *Journal of Design Research*), international conferences; societies of design research have been established in a number of countries. Design Research Society of the United Kingdom was established in 1996; International Association of Societies of Design Research (IASDR) exists since 2005. The situation with design research in post-Soviet space is different. There are some examples where design research is used as a service in professional practice of design companies and individual designers. The system of design education generally does not participate in this process seemingly ignoring international trends. It is important to note that the existing research courses introduced in the design master's programs

usually adopt methodological approaches utilized at the postgraduate level. As a result, master's students receive training in the specifics of "academic" research. Indeed, many master's students intend to proceed to postgraduate studies, and the received knowledge serves as a strong foundation for the academic work of these young professionals. However, it is equally important to develop applied research competencies of the future MAs in design – competences that will become a basis for their future successful practical work, which is especially valuable in situation of increased competition, also from foreign designers. Throughout the historical process of design development, a lot of research methods and tools have been developed and accumulated, both in design itself and in adjacent disciplines, but their actual use in professional practice is rather exception than the rule. We are talking not only about the so-called pre-drafting research that includes collection and analysis of similar models etc., but rather about the entire spectrum of tools between such diametrically opposing positions as the customer behaviour research (including behaviour mapping, shadowing etc.) and critical or speculative design. An attempt to fill in this gap by introducing design research in the design education has been a motivation for this paper. One of the few exceptions is a design research school based in Yekaterinburg and headed by Professor T.Yu.Bystrova; visual research practice at the Design School of the Higher School of Economics in Moscow; research at the Strelka Institute of Media, Architecture and Design and several other similar examples within the entire post-Soviet space. The sporadic character of these examples shows the lack of systemic approach and the need for wider discussions among educational and academic professionals, bringing this issue to the attention of the public and business community. According to the valid remark by Doctor R.Spitz in his 2015 interview to the *Design Issues* magazine, "The first thing is that society has to recognize the significance of design research. The proponents of design research have the responsibility to make people understand this significance." [3]

2. Materials and Methods

2.1. Design research as an academic discipline

Today "design research is in the midst of a historical process of defining itself as an established field of knowledge production" [4].

As Kyrgyzstan switched to the Bologna system of higher education, since 2012 the new state educational standards of higher education for the design specialty were developed, both for MA and for BA levels. The author of this article served as

the main developer of these standards. As part of methodological research for the program *Modernisation of Design Education* started in 2009 by the Chair of Design at the Institute of Innovative Professions at Kyrgyzstan State University of Construction, Transport and Architecture, the corresponding programs of the leading Western universities were studied. This analysis became a foundation for the advancements in local design-oriented programs. The study of the leading international experience also demonstrated that contemporary educational programs that strive to teach design as a strategic instrument or experimental approach, master's level training always includes courses in design research. Also, sometimes such courses are introduced into education design programs at the bachelor level (for example, in Parsons Design School in Paris). The issue of future changes in the 21st design education tied to the emergence of new computer design technologies, new areas of design research and, consequently, increasing role of research in design, was already raised in 1990 by Charles L.Owen, Professor of the Institute of Design at the Illinois Institute of Technology, who forecasted the challenges of the present: "Curricula must be revised to serve these needs and faculty must be recruited or developed to fill the new teaching and research roles." [5] While initially design research, according to R.Buchanan, appeared in the education programs only at the level of PhD studies [6], in 2010 G.Muratovski proposed that it should be introduced at the bachelor's level. [7] Still, until recently, even many foreign universities were reluctant to introduce design research courses in their design training programs – a fact that could be explained by art origins of many designer schools. [7]

2.2. What is, after all, design research?

According to B.Archer, "Design research is systematic inquiry whose goal is knowledge of, or in, the embodiment of configuration, composition, structure, purpose, value and meaning in man-made things and systems" [8]. M.Press and R.Cooper, authors of the book *The Design Experience: The Role of Design and Designers in the Twenty-First Century,* believe that the development of design in the 21st century will be completely dependent on research. They outline three major design research areas: understanding of context, generation of ideas, and search for solutions [9].

While developing basic *Design Research* course and its content, as part of the state-licenced standard for master's students, we relied upon the key aspects of the program *Design Research Methods* developed by B.Hantington, assistant professor at the Carnegie Mellon University's School of Design (USA) [10], author of the book *Universal Methods of Design: 100 Ways to Research Complex Problems, Develop*

Innovative Ideas, and Design Effective Solutions co-written with B.Martin. [11] Within the design research discourse there is a wide range of typological classifications [2, 8, 11, 12] whose study has become a part of the course. The main component of the course is design research methods and their practical application. In general, the *Design Research* course aims to train students in context research methods, allowing them to assess consumer behaviour and attitudes. The goal here is to introduce students to the specifics of applied design research. To master the course successfully, training in *Design Thinking* is required: this is a course that introduces students to the specific processes, methods and instruments (research including) for the development of human-oriented goods and services.

The goal of the *Design Research* course is to transmit theoretical knowledge in design research for the master's student professional activity; to teach tools used to conduct design research and analyse their results for the purpose of designing human material, spatial and information environment; to help master's students develop professional research culture.

The goals of this course are:

1. To teach the students major methods of design research;

2. To instil the skills in design research, processing and interpretation of the obtained data;

3. To instil professional interest in the research as part of the designer's work.

2.3. The domains of research strategies

The nature of contemporary challenges faced by the designers is characterised by uncertainty and complexity of tasks and opportunities potentially implicit in the design as a tool for problem solution; they require qualitatively new level of the research skills acquired by future professionals. The goal of this article is to sketch the main research domains that can be potentially introduced into the design educational programs at master's level: consumer research, iterative prototyping of forms and experiences, speculative research, experimental research, research into communicative aspects of design. Definition of main research domains does not mean that others do not exist: this list is open to expansion being only an enumeration of possible research strategies in terms of their potential demand in practice and in contemporary design education (as testified by their successful application in international context).

User research is based on gathering, documenting and analysing information to determine consumer needs and possible project framing. Design researchers "observe, study and analyse users while designing the project to obtain knowledge about their behaviour, habits, expectations and fears." [13] One of the first works on ethnographic design research was an article published by doctor of anthropology C.Wasson describing an experience of such research conducted by her at the E-lab, a design company that utilized anthropological research to develop new project ideas. [14] Today design ethnography is a tool actively used in contemporary human-oriented design. [15]

The end goal of ethnographic research is not a research as such but design. Research is used for inspiration and for the collection of preliminary or concrete information needed for the design. The main methods of design ethnography are: observation, including participant observation; individual or group interviews; participant research; method of cultural sampling. The data obtained should be interpreted creatively to develop design solutions; its re-thinking can lead to unexpected insights and ideas that could potentially produce genuine innovations.

Many major corporations commission design research performed by specialized design research companies. Equally important is a contribution by the specialized departments of corporate design services. For example, Google conducts User Experience Research project, in which users answer a number of questions helping to improve the company products. [16] Research reports by such international companies as Gensler, Steelcase and others contain valuable observation on changing consumer behaviour and data-based descriptions of future trends in work, education and healthcare and their influence on the organization of spatial environment in these fields.

A well-known CORE77 Design Award introduced nomination Strategy & Research, in which authors present projects or products developed mainly with the use of design research and strategies (of brand, product or project). The winners of the previous years [17] utilized such research methods as interviews, surveys, observation etc.

Another type of research is iterative prototyping of shapes and experiences to determine their utility and ease of use, often using field research and user-collaborative design. These may be storyboards, brainstorming, industrial experiments, user assessment. The efficiency of this method is demonstrated by the successful use of prototyping practice by such leading companies as Lego, Steelcase and others. Thus, when developing new products, Lego invites young customers as experts, testing prototypes in test sessions together with the children in order to develop the best solutions.

The third type of research is speculative or other theoretical or critical approach to design, which includes systematic probing and intervention into cultural discourse and

practice. This type of research utilizes hypothetic drafting and documentation, which later may be realized and introduced in reality to provoke a reaction. E.Dunne and F.Raby are the proponents of critical research whose work *Speculative Design* accumulated the best research experience in this area and became a standard reader in this approach. Thus, after the book appeared in Russian, we witnessed the first examples of use of the speculative strategies for educational and research purposes: based on the United Micro Kingdoms UmK project [18], a research group from Ufa (Bashkortostan) offers speculative method as a tool for developing future scenarios for re-vitalization of industrial territories. [19]

The fourth domain is experimental research whose goal is a search for new forms, methods, materials and technologies in design. Experimental research is one of the best-known types of design research; ithas become popular in the avant-garde of international professional practice and in the innovative design laboratories of leading universities. Despite at least a century of development (starting from the experiments of 1920s and the Bauhaus school), this type of research is still relevant and applicable for many types of design: from the traditional clothes and graphic design to the generative design (for example, morphogenetic experiments of Professor A.Mengers: exploration of the "digital evolution of geometry and automatic production to harmonize production logic, material limitations and increasingly complex form" [20]). The leading design schools promote experimental design research that open new prospective trends in shapes, technological innovation and materials. It is also important to note that the most promising results are achieved in interdisciplinary context.

The fifth domain is research into communicative aspects of design. Here an example is the Nordcode research network and workshops, which have become an important research venue not only for Scandinavian countries but also internationally.

Naturally, there is a question: how do we implement accumulated experience into the design educational programs?

3. Results. Practical Experience of Using Design Research in Kyrgyzstan

In today's situation design research should form a qualitative nucleus of a master's level educational program in design, becoming a key link in preparing master's dissertation. *Interior Design* education program taught at the Institute of Innovative Professions (Kyrgyzstan State University of Construction, Transport and Architecture named after N.Isanov) utilized the tree of research tasks, some of which will be described below.

The first year introduces students to the methods of design research: within the subject of the same name, where they learn to carry observations, photographic research, draft guides, conduct interviews etc. Equally important is the use of research documentation, methods for analysis and structuring of data, as well as generative and evaluative research methods based on the theme of their master's dissertation.

The next type of research is carried out within the subject *Interior Design Studio: Advanced Course*. These are speculative projects – for example, the development of the series of creative spaces. The students are asked to develop their ideas on the nature of creative economy and future social demand for the corresponding infrastructure. As preliminary constructs, based on the research into contemporary trends in digital transformation of economy, development of 3d printing, AR, VR etc., the students have explored future scenarios in retail trade, food service, culture etc. Team generation of ideas during the brainstorming session led to the emergence of several unusual concepts further developed in subsequent work. For example, while thinking on the future of retail, students outlined possible demand for the "creative markets" where any model chosen by the consumer is made on the spot in the 3D workshop (similar to FabLab) or is co-created by the consumer together with the professionals in a co-design studio. During production, the customer can spend time in an "experiment laboratory", where VR technology offers realistic tourist experience to every corner of the world, in order to produce new inspiration.

The project *A Space for Creativity: Food Services* included, for example, such components as: tastes generator, bank of tastes, workshops and tasting cafe. Tastes generator works as an electronic "mixer" used by customers to experiment. The blended components are chosen by the customer on a screen that not only visualizes them but also informs the customer about recommended proportions, possible combinations and taste nuances. After the recipe is completed, the product is offered for tasting. In case of good combination, the resulting product can be saved in the bank of tastes, where it will be given the customer's name and made available for other customers. While taste generator creates conditions for mental creativity made real by a machine, a workshop gallery offers users space for physical creativity, where the results can be immediately tasted by their friends and by everyone else in the tasting cafe.

In a public creative centre, creative workshops become inspiration spaces, where innovative environments are produced that potentially could immerse the viewers in the new and unusual states through dynamic tactile, optical and sound synesthesias. The spaces facilitate creativity, which can be realized both in traditional formats (workshops in painting, drawing, sculpture, contemporary art etc.) and in the new ones (one of the

offered example was a "white gypsum" space, where the users can utilize a mobile app to "materialise" some elements of such space in a real world – that is, create colour, texture and even sound). Such user creativity in a real space could provide unlimited possibilities for development, opening doors and eliminating barriers created by stereo-typical thinking, encouraging everyone to become creators and experimenters. The availability of creativity should not scare the professionals, since the main goal of such spaces is to encourage creative abilities possessed by every individual by eliminating psychological barriers that hinder such abilities, and to produce open experimentation and immediate interactive response.

The next type of research is experimental modelling practiced within the educational subject of the same name. Within this course, students master the technique of finding non-standard solutions within a given problem by experimenting with shapes. For example, one of the experiments with ready-to-hand materials is an answer to the question "what could this be" – it liberates the students' thinking allowing chance to become a trigger of inspiration.

Another format is used to develop the research competencies from a different angle, as a research group organizer. Students master it as part of a roleplay game conducted within the course on design management. The goal of the business game *Project Management: Development of Innovation Product in a Design Studio* is to teach students a number of competencies in research, design and management. The students' team (typically 4–5 students) is immersed in an imaginary context of a design studio that has to develop an innovation product or service to a tight deadline. In case of actual commissions from concrete clients, the project briefs can be formulated by the clients. The team begins to work on the research mini-projects, each of which is managed by a participant who had initiated this research (of, in case of a customer's commission, based on participants' discussion and choice). At this stage the participants draw lots (to establish equality) to determine who is going to take which theme for the research. Throughout the game, project supervisor manages the process by guiding and correcting the participants. Then the participants, in their roles of researchers, present the preliminary results for general discussion in order to generate a lot of ideas during the brainstorming session.

After the generation of ideas, the results are ranked to highlight the most promising ideas. Then the participants draw lots to become the designers and visualizers of ideas. After the completion, the supervisor of each project presents the solutions, thanks the participants and provides evaluation by critically assessing both positive and negative moments and the way they were overcome. The end goal of this game is to help

the students understand the innovation process and learn to guide it, since, for the major part, this process is represented by generative (brain storming) and exploratory research. The practice of using a wide range of research when developing innovative products is the future goal for the designer, and the game prepares the students for such challenges. According to one of the participants (O.Shalina), it was "an unforgettable valuable experience that I will remember forever."

4. Conclusion

The study of design research is one of the highly relevant trends in international academic design discourse. International experience shows that design research contributes considerably to the movement towards better understanding of consumers and, as a result, to the development of innovative products and services, creation of future scenarios etc. Still more important is a discussion of possibilities to implement various types of design research in the content of master's design educational program in order to instil best international professional experience and innovative approaches, providing future-proof training of new generation of design professionals and preparing them for actual and potential challenges of contemporary world. If design education persists in protecting its comfort zone and ignoring changes that occur both within the design and around it, the results, in the situation where society has come to expect so much from design and consider it omnipotent, could be catastrophic.

This experience showed that design research could become a connecting nucleus of master's level educational programs in design. Further advances in methods should become a foundation for permanent introduction of design research in professional field, including development of actual innovative products and services, new unexpected projects and discourses.

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