DESIGN FOR EXTREME ENVIRONMENT: THE EXPERIENCE OF THE MASTER OF DESIGN COURSE

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ABSTRACT
Russia is the largest northern polycultural country, i.e. the territory of environmental and cultural extremes. The issue of comfortable human existence may be solved by creating a 'new culture' as an aggregate of adaptive behavior patterns, which could be clearly expressed through the material environment. The main prerequisite for all master's degree projects is the possibility to change the direction of culture 'making': from artifacts to human internal fundamentals.
The 'concept-in-work' of MD course educational programme includes the following "Three Pillars":
1) Key question: **What?** The type of activity: Creation (it is the ability to grasp a situation as a whole by force of creative (or artistic) intuition (neither by reason nor by perception). The output of this "flash of inspiration" would be an image of the solution, i.e. the "soul" of the future object). Key role: Artist.
2) Key question: **Why?** Type of activity: Research (it is a targeting activity. The output would be a statement with detailed explanation and benchmarks for "executing designers"). Key role: Scientist.
3) Key question: **How?** Type of activity: Engineering (it is a stage of embodiment via laws of composition and combinatoric principles). Key role: Constructor.
Keywords: Regional Approach, Russian Arctic, 'New' Culture, What-Why-How, Master of Design

1 INTRODUCTION

In 2005 the first Master of Design Course in Russia was launched at the Department of Industrial Design, Ural State Academy of Architecture and Arts (USAAA), Russia.
Over 40 years, the Department has gained vast expertise in the training of designers for different sectors of domestic industry. The focus of the education provided by the USAAA is on the interests of the region. It means, first and foremost, strict relevance to the needs of the Ural-Siberian market and close connections with local resources, industrial facilities, and consideration of natural, cultural and ethnic peculiarities.
The increasing role of the Ural Federal District as the nation's base of natural resources (especially, hydrocarbon fuels) entailed mass migration of people from temperate climate zones to the extreme northern (or Arctic) environment. This set off a chain reaction:
- an unpredictable growth and complexity of social and cultural problems, which are related to the adaption of 'newcomers' to new, harsh natural conditions; and as a result of it
- enhanced professional requirements concerning the preliminary stage of design, i.e. in-depth research into the so-called 'Northern problems'.
Thus, the need became obvious for establishing a separate research & design branch for analyzing social and cultural problems and developing methods to solve them by the design means.
The main concept of all MD work is based on the long-term experience of the Academy and on the call of the times for development of a 'New Northern Culture'. In other words, would-be Masters of Design should be taught not only as designers, but also as researchers with specific skills in systems analysis of problems related to comprehensive adaptation of people to the Arctic. They should be able to develop a design concept as a strategy of creating and implementing new methods and principles applicable to the region. Therefore they should consider the region's polycultural features, i.e. the collision of indigenous and strangers' cultures and should predict their synthetic future in the context of rapid industrialization of the Russian North.

The main purpose of this paper is to present the concept of the educational programme of the so-called "Arctic Design" or "Design for Extreme Environment" for MD Course in Russia.
First of all it is necessary to identify the place of the "new-born" MD Course in the system of Russian design education:

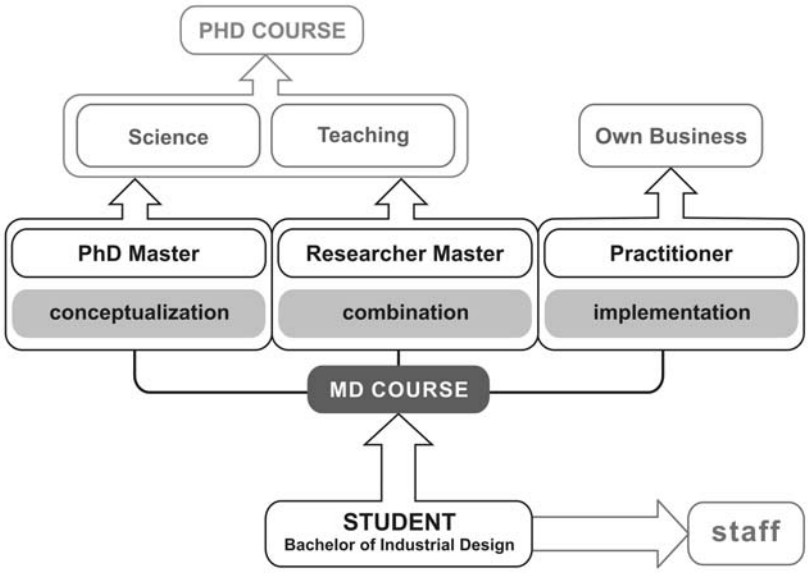

Figure 1. A Model of Professional Realization of Design Students in Russia (with consideration of MD Course in the educational system)

The paper consists of three main parts. The first one is devoted to the theoretical and methodological basis of the concept. The second one is about the educational programme per se (with the description of key disciplines). At the end of it, a model of "ideal" MD education is presented (open to discussion).

2 "DESIGN FOR EXTREME ENVIRONMENT" AS A PROCESS: ORGANIZATIONAL STRUCTURE

2.1 Towards a New Notion of Design

Thus, the process of design for extreme (in our case, arctic) environment is primarily of a dual nature:
- on the one hand, it should be ultimately "transparent" [acc. to 6]: especially at the stage of data selection. Trials and errors are inadmissible;
- on the other hand, it should keep the secret (or the mystery) of the "birth" of an image (a "black box" by Jones).

First of all, we should suggest a conceptual basis for this methodology, i.e. an appropriate definition of design in our case. The following triad introduces design as a combination of three kinds of professional activity, which is described by three main issues: *what-why-how*.

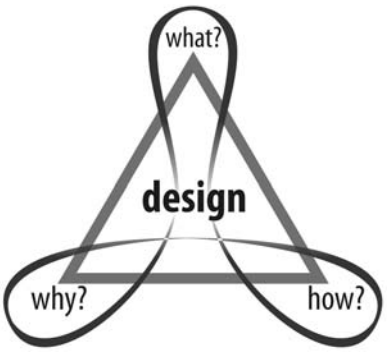

Figure 2. A Key-Questions Triad of Design

1) Key question: **What?** The type of activity: Creation (it is the ability to grasp a situation as a whole by force of creative (or artistic) intuition (neither by reason nor by perception). The output of this "flash of inspiration" would be an image of the solution, i.e. the "soul" of the future object). Key role: Artist.
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Sources for answers are known as follows:

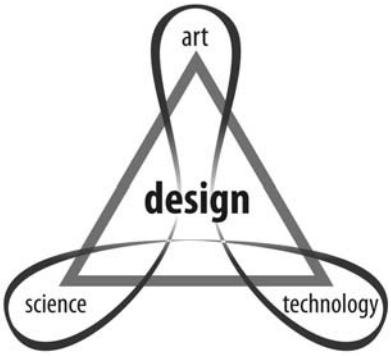

Figure 3. A Triad of Key Sources for Design Activity

Thus, the next issue is to transform them into an educational programme.
So, the programme presented below proceeded from the following:
- the assigned task (the 'New culture');
- the potential of teaching staff[1];
- the project experience of the Academy; and
- the themes of research works on the most actual and burning issues of the region.
The themes of MD works first and foremost should be concerned to the following issues:
- ecological (or environmental) issues of the Arctic region;
- sustainable keeping of indigenous cultures;
- design and development of transport vehicles, expeditionary equipment, housing units and for newcomers (e.g. shift-workers of extractive industry), clothes for dwellers, etc.

3 A CONCEPT OF MD EDUCATIONAL PROGRAMME

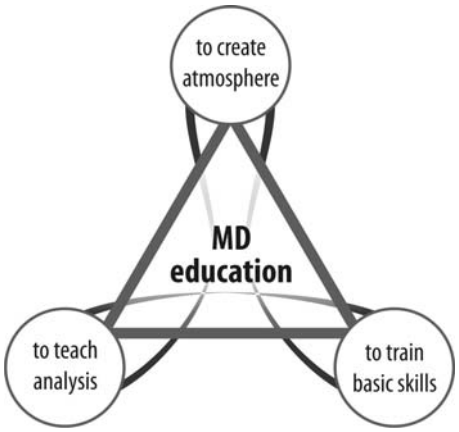

Figure 4. A Triad of Key Teaching Tasks in the Framework of MD Education Programme

[1] They are actually representatives of three streams: practitioner, theorist and synthetic specialist as well as the Leader of MD Course.

Let's start from the most well-known point, so-called *design technology*. It contains practical aspects of design process, such as laws of formal composition, sketching techniques, etc. In terms of a real educational (as well as practical) process this stage is final: we would start doing something only when we already know *what* and *why*.

3.1 Design Technology: "Just Do It!"

The disciplines in the *technological* framework are as follows: *Design Project* and *Design Ecology*.
1) The first one is about *design technology* per se.

Design Project

This discipline is the essential part of high design education and, therefore, the most familiar to students ever since they have been enrolled in the Academy.
The main goal of the discipline in the format of MD Course is to train basic skills of implementing students' creative ideas as well as developing new techniques of visual representation of students' research findings.

2) The next discipline is absolutely new for students enrolled in MD Course in the Academy. It is the "educational product" of the Arctic specialization of the Course. Its key feature is *science* inside *technology*.

Design Ecology

Examining eco-aspects of the Arctic indigenous life (especially their material culture) is extremely urgent and topical. This discipline synthesizes multi-aspectual knowledge of environmental, cultural, ethic, moral and legal regulations and values within the framework of a concrete territory with its own natural, economic, ethnic and other features used as a basis for preproject design research. The skill for handling this knowledge is critically important for would-be Masters.
A special part of this discipline is direct acquaintance with the nomadic and semi-nomadic way of life of the indigenous northerns; their production and living cycles (annual, diurnal); a set of things and objects, essential and sufficient, for their way of life their classification by priority, role, and image; obvious unity between man and environment.
The discipline results in the following:
- students are able to identify, distinguish and relate the principle of borrowing from the indigenous culture of the northerners for using it in design for extreme environments.

3.2 Design Science: towards a "Glass Box"

This stream contains the following disciplines: *Regional and Cultural Studies* (including *Research & Artistic Practice*) and *Methodology of Design Research*.
1) The discipline below is *a pure science*.

Regional and Cultural Studies

General purpose is to make regional peculiarities (in climate, industry, economy, culture, etc.) tailored to an audience of MD students, i.e. to provide students with a comprehensive knowledge about the *design context*[2], i.e. the regional peculiarities.
More specifically, the Ural Federal Area is a territory of several administrative regions (oblasts) with various nations. The complicated process of ethnogenesis is now going on against the background of intensive extraction of natural resources.
Of course, for making the acquaintance with the region deeper and more effective for getting knowledge it needs to undertake a series of field studies (expeditions). And it does annually.

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[2] The result of design actions in terms of the eco-vulnerable Arctic would be a 'New Culture' – synthesis of the monoculture of indigenous minority and the 'kaleidoscopic' culture of aliens.
By New Culture we understand:
- the strategy of ongoing development of resources in the Arctic zone,
- growing migration of people from regions of temperate climate to Arctic zones,
- growth of cities and transport networks with all intrinsic infrastructural components,
- development of international tourism as a huge and unique resource which requires a special ecological approach at both conceptual and implementation stages.
Today all the above is happening spontaneously.

Research & Artistic Practice (Field Studies)

Research & Artistic Practice is an addition of high importance to the basic academic education of Masters. The key role of this discipline is in gaining:
- practical skills of detecting problems 'on-site'; as well as
- ethical and environmental regulations for solving those problems by the means of design.

This combination is the essence of a comprehensive notion of Master of Design.
Field work involves the identification, recording and detailed analysis of all the world of things ensuring comfortable and ecofriendly living in a given territory (a village, a settlement, a separate family), referenced to the terrain, near and distant neighbors, the spiritual part of culture, traditions, etc.
Expected Results:
- research articles (from conceptual proposals to field work methods descriptions, etc.).
- exhibitions of expedition materials, films, drawings, photos, etc.
- discussion and definition of course, degree and dissertational works based on the materials of the expeditions.
- expedition workshops are held to encourage the exchange of impressions, hypotheses, and professional specificities.

The local population is possibly involved in the solution of problems addressed by the expeditions.

2) The next discipline has *technological* character in *scientific* framework.

Methodology of Design Research

The main goal of the discipline is to provide students with a special toolkit for detecting research problems.
In accordance with the goal, the teaching and learning objectives are seen to be as follows:
- to enable students to apply the well-known methods (especially methods from the theory of formal composition) to the new kind of activity (research analysis and synthesis) and to realize a step-by-step transformation of "virtuosic" methods into "compositional" ones [acc. to Wassily Kandinsky];
- to equip students with skills to ensure easy transition from visual to verbal communication and vice versa;
- to develop in students a mechanism for generating new (personal) research methods in design.

All disciplines listed above are arranged according to their "educational essence": each of these streams (*technological* and *scientific*) contains the same elements inside, i.e. *technological* and *scientific* disciplines. This is an indicator of fractal model, therefore when we continue the sequence we'll get the whole triad repeated in a small scale of one apex. In terms of educational programme it means *Art* as the essential component of every type of activity in design. Hence, it is necessary to take this element into consideration, if we want to develop a comprehensive and viable model of MD education. Thus, the triad now is like an equation with one unknown quantity, i.e. the element *what*. Let's try to solve it.

3.3 Design Creativity: Stay "black"

According to Jones the essence of artist notion is to be a "black box", i.e. the act of creation is itself mystical, irrational and unpredictable. Therefore, it is incorrect to rely on this feature in professional design activity. But on the other hand a creative insight (a flash of inspiration) is the shortest way of hitting the mark, i.e. the way to find the right decision and to reach success. Indeed, the question *what* has the most importance.
The element *Art* is subjective itself. It is an integral feature detectable in every action of any individual. Whatever we do (drawing, painting, writing, making things, etc.) we always put a part of our soul into the process and, therefore, into the result. The *Art* is beyond the limits of the system of general education. Therefore, it is necessary to identify the main task of design education: to equip would-be designers with methods of research and embodiment, i.e. *why* and *how*. Though, the ability as well as the mission of design teachers is to create the atmosphere for display of genius, of God-given talent… We proceed from the assumption that artistic thinking is impossible to be learnt, i.e. to be "import" to mind, but it should be awaken and provoked by a certain educational environment. According to Sigmund Freud and Carl Gustav Jung, we could call this phenomenon "professional

unconsciousness". And our final discipline (it has no special name; we call it "Artistic or Creative Thinking") is devoted to "switch on" this thinking and actively involve it into design process.
The main point is that there is no need to expose and "dissect" the creative nature; we should thankfully use the results of its functioning.

CONCLUSIONS

The conceptualization of the Master of Design teaching and learning process has resulted in the following:
1) Theoretical value:
- a new notion of design is suggested (in the form of a triad);
- a new purpose for design activity has been identified (i.e. the development of a "New Culture");
- the potential as well as the limits of the design profession have been defined;
2) Practical (educational) value:
- a framework for a special Master of Design programme has been developed for the Russian context;
- a series of projects based on the suggested methodological approach have been developed.
3) Prospects for further development have been outlined:
- to develop a comprehensive model of the MD educational process as a fractal combination of disciplines of three types (*artistc/scientific/technical*).

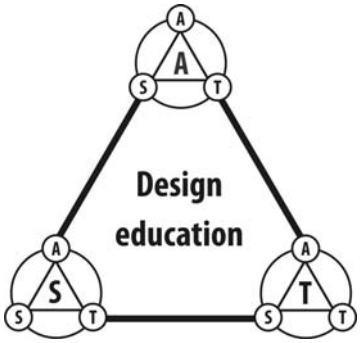

Figure 5. A Fractal Model of Design Education

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