COMPARATIVE ANALYSIS OF SKILLS DESIGN, CONSTRUCTION AND MODELING

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У статті розглянуто феномен понять «проектувати», «конструювати» і «моделювати». Проаналізовано пов'язані з цими поняттями терміни «проект», «конструкція», «модель». Виокремлено етапи проходження процесів проектування, конструювання і моделювання. Представлена порівняльна характеристика цих понять.

Ключові слова: *проект, конструкція, модель, проектування, конструювання, моделювання.*

В статье рассмотрены феномен понятий «проектировать», «конструировать» и «моделировать». Проанализированы связанные с этими понятиями термины «проект», «конструкция», «модель». Выделены этапы прохождения процессов проектирования, конструирования и моделирования. Представлена сравнительная характеристика этих понятий.

Ключевые слова*: проект, конструкция, модель, проектирование, конструирование, моделирование.*

The article deals with the phenomenon of the concepts of "designing", "constructing" and "modeling". Terms "project", "construction", "model" are analyzed. The stages of the passage of the design, construction and modeling are defined. The comparative characteristic of these concepts is made. As a result of comparative analysis skills to design, construction and simulation it is suggested that they have a common goal to create the object (project, design or model). But the processes and the results of work activity are different, because the functionality of the project, de

sign and model is different. Project, design and modeling are: creative processes, which have their laws, rules and algorithms; require knowledge from different disc iplines; have a wide range of applications in various fields; can be used on a glob al and personal meaning; as a result of activity creates a product (design, construc tion, model).

Keywords*: project, design, construction, designing, constructing, modeling.*

Formulation of the problem in general. Nowadays specialist skills are req uired more and more for design, construction and simulation in the workplace. Thi s process is used in many areas.When Speaking about the ability of design, constr uction and modeling it is necessary to note some similarities with several paramete rs. Therefore it is appropriate to examine them in one article for the purpose of co mparative analysis.

Analysis of recent research and publications. Terms "design", "constructi on" and "modeling" are the subject of much research of the domestic and foreign s cholars. Thus, in the nonfiction much information is about designing. For researche rs some of the interesting questions before them are about the philosophy of the p roject activity (Liakhov I.I.) content design (Dixon D.R., Jones D.K., Dietrich J., H ill P.), features of project learning (Dewey D., Ilyin G.L., Pakhomov N.Y., Polat E. S., Chechel I.D.) , designing in the construction business (Nestle H., Horbic O.R., Lomovskiy A.I.) and others.

Many authors studied the problems of the constructing in the different areas such as artistic construction (Pokatayev V.P., Naumov V.P., Shpara P.E., Grigorie va V.), construction of the clothes (Sakulin B.S., Parmon F.M.) , technology constr uction (Eisenberg J.B., Borisov V.F., Klymachov I.I., Nechyporuk G.S.), education (Morev A.A., Gavrylenko A.P., Zharynova I.A., Ternovskaya O.V., Yeleseyeva E. Y., Nilova V.I.) and others.

The science has a large number of researches on the problems of modeling. These studies open questions on how to use of models and simulation methods in s eparate sciences: philosophy, psychology, pedagogy (Burenkova N.V., Vinaykin N .P., Stecenko I.V., Desnenko M.A., Gryaznov B.S., Dynin B.S., Novik I.B., Shtoff

V.A., Davydov V.V.).

Analysis of scientific and educational literature has shown that, the issues ab out design, construction and modeling are studied by many researchers. But this su bject is open for theoretical and comparative analysis.

The purpose of the article – a comparative analysis of skills design, constru ction and modeling.

The main material. In order to conduct a comparative analysis of skills des ign, construction and modeling we need to cover the basic concepts of "design", "c onstruction" and "model". In the dictionary we found these definitions:

Design – 1. Developing, making the project (buildings). 2. Assuming, to goi ng to arrange something

Construction – (from the Latin construere – build) create design of somethin g, build something.

Modeling – 1. In sculpture – handle surface, creating a convexity on it and d eepening. 2. In painting, to create texture (pattern) with the help of light and shado w and sculpting brushstrokes. 3. Manufacture (manufacturing) model of something .

Comparative analysis of the terms "design", "construction", "modeling" sho wed that these phenomenons have similar parts. So in general in these definitions a re the skills to create some objects (projects, construction, models). But for a more detailed analysis it is necessary to study these processes.

The term "design" is organically linked with the concept of a "project" becau se the design is the process of creating the project. In turn, the phenomenon of desi gn can't be determined, without fixing attributes of the project (this link also exists between the definitions of constructing-construction and modeling – model). In mo dern domestic and foreign scientific literature there are several definitions of the te rm "project", each of which has the right to exist, depending on the particular probl em facing the specialist. Summarizing these views, we came to the conclusion that the project – a collection of documents (working drawings, models, calculations, et c.) required for the construction or reconstruction of the facility that require prior a

pproval.

Analysis of the literature confirmed the opinion Kirichuk V.A. that today the representation of the essence of the design, its scope has changed significantly. Unt il recently, the design was attributed mainly to engineering activities in the field of instrumentation, construction and understood as "a plan, a prototype of a particular object". Today, design is considered as a special kind of activities, covering all part s of the social organism, including the education system.

Another way to illustrate the unique nature of the project – to describe the lif e cycle of the project. It is sequentially passes through four stages (Martin P., Gra y K.F.):

1. Preparation of the project. In this stage need to define range of problems, limitations, constraints and priorities of the project. This document must approve the customer.
2. Planning. The most important step. In result of this stage we have a project plan, which show a detailed plan of the work.
3. Implementation of the project. In this stage need to perform work directly related to the creation of the final product.
4. Completion of the project. Customer evaluates the degree of their satisfaction with the project.

But it should be noted that these steps are not constant and may vary dependi ng on the task.

In the design process, along with the calculated and experimental stages of r esearch, researchers often secrete process of construction. (Gavrylenko A.P., Moro z V.I., Naumov V.P.). Construction in general is the process of creating constructio n. And construct is a structure plan, the mutual arrangement of parts of a building o r structure itself, a building, a car with a more or less complex structure [7, 367].

The analysis of the literature showed two kinds of construction technical and artistic. Technical design creates an object in its material and functional basis artist ic – subject fills the general content, comfort harmony and beauty. The artistic desi gner realize the designer who owns the aesthetic impact of laws and knows how to

apply them in the field of technical design (from design conception and compositio n to the study of aesthetic tastes of consumers). He should be able to submit a form of future products, be a dreamer and a practitioner, has the gift of scientific predicti on [3, 53].

Pokataev V.P. proposed four stages of the artistic construction:

1. Exploratory phase. It begins with a specification that contains information about the functional purpose and conditions of use of the product and basic technical data (dimensions, materials, etc.). In this stage designer should collect information on the basis of domestic and foreign literature (information, photos, brochures, technical and design characteristics, etc.) and its analysis, the study of similar samples of products (in kind or in literature sources).
2. Searching. During this stage the designer with the help of sketches (graphic and volume) finds a fundamental artistic and design solution. After analyzing the possible solutions is chosen the best option.
3. Project phase. In this stage the designer performs a drawing in orthogonal and perspective projections.
4. Design stage – performed a general drawings of product, its construction, templates, working model of the product (if it's need) and made a technological maps for manufacturing operations [4; 6].

Comparing analysis of the phases of design and construction, showed obviou s similarity of these processes. It has a same processes and kind of activities. But a products is different (in the first version it is a project, in the second - construction) . And modeling has a different nature. Because the models are: 1. a sample of so me product 2. to reproduced, usually in a reduced form, a sample of some facilities 3.a type, model , sample designs, 4. a model, an object needed for artistic reproduct ion , image 5. a model for an explanation of a physical phenomenon or process in t he foundry business [7; 455].

Term "model" has a many definitions. But it has some common fundamental

ideas. So we have two types of models: the first type suggests the prototype of the object which not existing, second type is a copy of an existing object, it is made f or reproduce, study or replacement.

Modeling is very popular method for creating models. It's means, for study s ome object need to create other similar model. After study and research the model, the results transferred to the original object or phenomenon [2].

Modeling is very important for designers, researchers and others. Because it performs many tasks. Stetcenko I.V. identifies next goals: modeling, control, identi fication, optimization, prediction [6; 11].

There are many classifications of modeling in modern literature, because the spectrum of application of this kind of activity is very broad. Burenkova N.V. prop osed pick out training and scientific modeling. There are a number of differences b etween these specie:

- The training simulation is used for learning by students known to science facts and regulations, and in science modeling applied to research unknown phenomena, processes, objects.
- Educational model is the means which help to research the objects, phenomena, processes, and a scientific model is itself objects of knowledge.
- The teacher knows what object can be taken as a model of this phenomenon in teaching, and science does not know what model will be after research.
- Training models (to solve problems) can serve as a means of analysis and solutions if model has similarity to the reality. The scientific modeling must have similarity to the prototype models [1; 16].

These differences have a one goal - creating a model for cognition.

Modeling, as well as design and construction, has its stages. So Burenkov a N.V. identified next stage: 1. the step of selecting (constructing) models, 2. to wo rk with the model , 3. a transition to reality [1; 14]. But some researchers (Stetcenk o I.V., Sanin S.P.) distinguished one more stage – a preliminary analysis. In this re

gard we can see that the processes of modeling are different from processes of desi gn and construction. But it has a one goal.

Thus, the analysis of literature in this article, show a common ideas in the de sign, construction and modeling. All this processes are:

1. creative processes, which have their laws, rules and algorithms;
2. require knowledge from different disciplines;
3. have a wide range of applications in various industries;
4. can be used in global and personal sense;
5. as a result of this activity creates a product (design, construction, model).

We can see these phenomenons have many common parts, but it has some di fferences too. For example, the term "project" has a broad meaning, it may be inclu de construction and models. However, construction like projects are designed in s uch detail as is necessary for their implementation. And models don't need it. Spah ra P.E. has another interesting observation. He said that the term constructing sugg ests the detailed construction of the object or idea. And development of a project is usually called the design [8].

Conclusions. A comparative analysis of the skills of design, construction an d modeling, showed that they have a common goal – creating an object (project, co nstruction or model). But the process and result of work activities are different, bec ause the function of the project, construction and models are not same.

Literature

1. Буренкова Н. В. Моделирование как способ формирования обобщённого умения решать задачи : дис. … к. пед. наук : 13.00.0.1 / Буренкова Наталья Владимировна. – М., 2009. – 208 с.
2. Винайкина Н.П. Основы моделирования познавательной деятельности учащихся (на материале французского языка) : Практико-ориентированное учебное пособие / Н. П. Винайкина, Л. Д. Рагозина. – Белгород : Издательство БелГУ, 2000. – 206 с.

3. Наумов В. П. Основы художественного конструирования в техническом творчестве : Учебное пособие / В. П. Наумов. – Магнитогорск :МГПИ, 1998. – 76 с.: рис. – Библиогр.: с. 72-73.

4. Покатаев В. П. Дизайнер-конструктор. Учебное пособие / В. П. Покатаев. –Ростов н/Д : Феникс, 2006. – 379 с. – (Строительство).

5. Проектні технології загальноосвітнього навчального закладу в системі навчально-виховного процесу : методичний посібник / [Киричук В. О., Прашко О. В., Смотрін О. В., Марченко С. С.]. –К. : Інститут обдарованої дитини НАПН України, 2011. – 72 с.

6. Стеценко І.В. Моделювання систем: навч. посіб.[Електронний ресурс, текст] / І.В. Стеценко; М-во освіти і науки України, Черкас. держ. технол. ун-т. – Черкаси : ЧДТУ, 2010. – 399 с.

7. Ушаков Д. Н. Большой толковый словарь современного русского языка. М.: «Альта –Принт», 2007. – VIII, 1239 с.

8. Шпара П.Е. Техническая эстетика и основы художественного конструирования : [учеб. пособие для вузов] / П. Е. Шпара, И. П. Шпара. – [3-е изд.]. – К. : Вища школа,1989. – 247 с.