Competency position of Bachelor's degree in education

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ABSTRACT: The article begins with a thought borrowed from the book *The Peter Principle*. The result of the analysed hierarchical regression is the loss of the competency value of individual levels of education. This can be loosely interpreted as follows: ...in the past, everybody who could read and write was competent to work in a position of responsibility. For the generation born in the 1920s, high-school graduation was a sufficient competence criterion to be able to hold fairly respectable jobs. If one accepts the validity of the hierarchical regression, one has two alternatives to choose from. The first is the aforementioned principle of hierarchical devaluation, where career-related hierarchical structure is maintained and the competency-related hierarchical structure based on the achieved level of education is suppressed. The second alternative involves the upgrade of the existing education-based hierarchic structure, i.e. the increase of the validity of the established levels of education. The appraisal of the position of the Bachelor's degree in the Faculty of Architecture at Slovak University of Technology in Bratislava started with its introduction in 1991, i.e. before the implementation of the Bologna process. The objective was, and still is, to clearly define the position of a Bachelor's degree with respect to competency in the education hierarchy.

Keywords: Hierarchical regression, competency position, education hierarchy, design studio, Bachelor's thesis

INTRODUCTION

A popular witticism from the book The Peter Principle: *A person climbs the career ladder until they reach a position for which they are not competent enough and they stay there* indicates what the first consequence of the principle is - that gradually, all important posts are occupied by incompetent people. It is a book based on serious research focusing on the hierarchy of the incompetent.

Hierarchical regression and the decline in the competency value of levels of education [1] mean that the value of secondary-school leaving examination and a university degree functioning as limits/thresholds for promotion competency diminish. With respect to the hierarchical regression, one has now found oneself in the situation in which the secondary-school leaving examination basically only has informative value.

The more people achieve a certain competency level, the more its validity decreases. A different (higher) level is needed for a higher career position, which leads to hierarchical devaluation. If not everyone can read and write, then completed elementary education has competency value. When everyone completes elementary education, one needs a secondary school leaving examination to distinguish the quality. The moment the majority of the people in a country have a secondary school diploma, one wants a university education.

Thus, if the validity of the levels of education is pushed downwards, it is necessary to intervene and make an upgrade of the educational hierarchic categorisation. For a long time, this procedure has been, unsuccessfully, the subject of reforms. One should not dwell on the elementary education; in principle, everyone has to have it and it is necessary to increase the quality of its content, its completion only cannot be a basis for selection. When one wanted to increase the percentage of the population with secondary-school education, one lowered the quality threshold for acceptance to secondary-school education. It triggered the competition for getting only the best grades at the elementary school level.

Secondary schools should be structurally selective in nature. If, as a result of increased quality of educational content, the value of the secondary-school diploma is successfully increased, the competency value of a secondary-school diploma holder or a person with any secondary school education will increase and they can receive appropriate social recognition. Besides money, social recognition is the objective of getting education. A competent graduate constitutes a professional adequately reacting in various specific situations [2].

The article contains reflections on the aforementioned trends in the Faculty of Architecture of the STU. Since the Bachelor's study programme was established, it was clear that the 4+2 model could not simply be a linear division of the continuous 6-year study. The Bachelor programme's autonomy has logically developed over the course of several years. In relation to the increasing competencies of its graduates, a structure was established of competency models that reflect the specifics - particulars of the profession of an architect or of a Bachelor's study programme graduate. The models include universal and specific competencies and become a tool for identifying strengths in the educational process [3].

One is not going to concentrate on the usefulness of Bachelor's degree in the job market, as one would have to navigate a relatively dense system of regulations within the EU. The specific challenge will be the change of the position of architecture. The traditional paradigm of architecture as the mother of all art will make way for the increasingly urgent social demands and challenges of overall organisation of life, especially in towns. Architects - Renaissance artists will be replaced by architects - social and cultural mediators. Artistic talent will not be important unless the architect is gifted with social intelligence.

At present, the Bachelor's programme in the course Architecture and Urbanism, field of study 5.1.1. Architecture and Urbanism, focuses on theoretical knowledge and skills based on the current state of science or art, and on the ability to utilise them in one's profession or when continuing one's university studies in the follow-up programme. The standard length of the Bachelor's study programme is 4 years. The Bachelor's programme is completed with a state examination and defence of a thesis. The graduates are granted an academic title *Bachelor* (abbreviated as *Bc*). The study programme primarily focuses on the preparation of graduates that fulfil the requirements to be accepted to an engineering course in the same or a related study programme within the field or within related fields of study.

Under the supervision of an authorised architect or of another authorised person, graduates can process architectonic or urbanistic designs and projects. They are qualified to prepare and evaluate the supporting documentation needed for an architectonic or urbanistic design. They are familiar with the basics of architectural and urbanistic design, know and can use methods and techniques of architectural and urbanistic designing, are acquainted with the history of architecture, urbanism and art, in the field of construction and technology-related disciplines, social sciences and humanities related to architecture and urbanism; they are capable of basic computer support for architectural and urbanistic designing, have information about fundamental legislative aspects regarding architectural and urbanistic design and their practical application [4]. Students that have completed the programme can expand their professional (profile) specialisation by choosing an optional module focusing on an aspect/area of architectural, interior, urbanistic or landscaping design or by studying courses at another school/university (mobility).

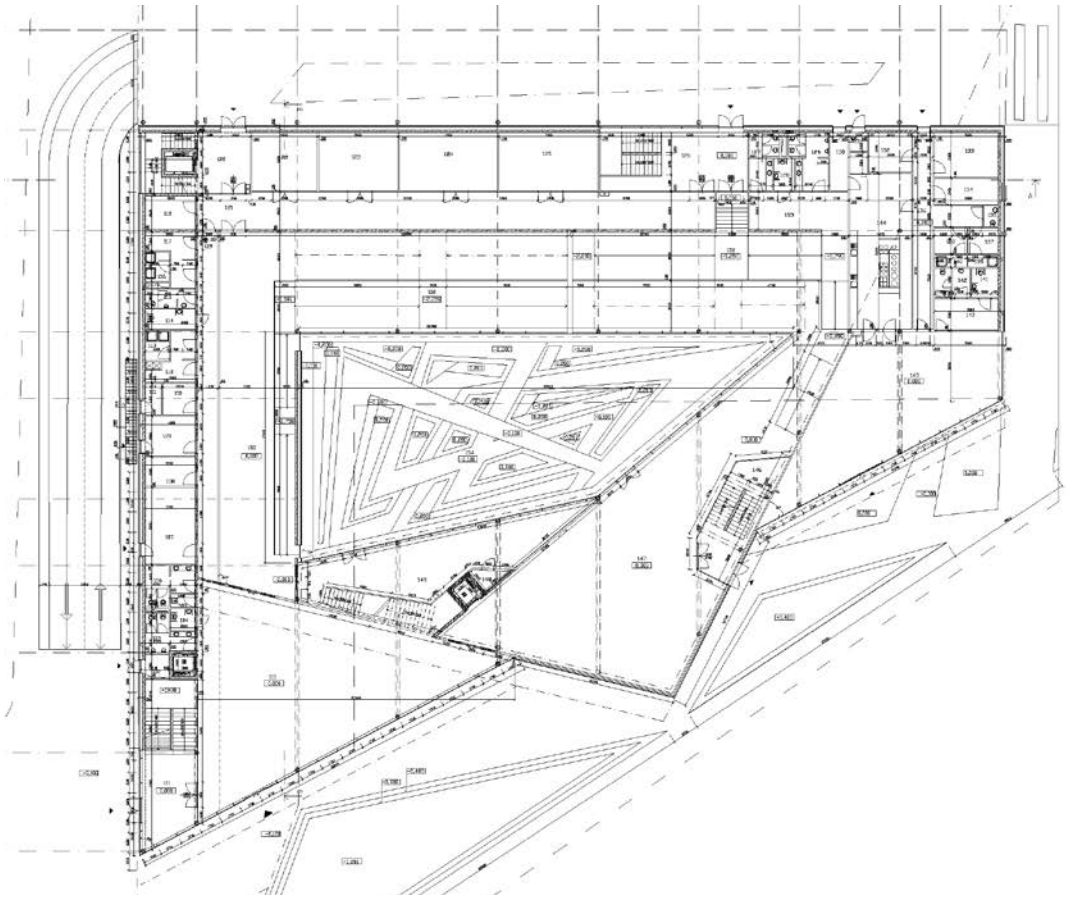

Figure 1: Ground floor plan.

The competency of a student is tested by a Bachelor's thesis in the last semester of study, which is relatively comprehensive in its nature. In the Bachelor's thesis, students demonstrate their ability to synthesise the acquired theoretical knowledge and skills from typological, graphic and technical disciplines with the emphasis on coordination activities in the process of creating an architectural work at the building design level (building assignment). The result of the design is an architectural-construction project demonstrating the ability to handle technical aspects in the building design (static properties of load-bearing constructions and their elements [5], technology pertaining to the building interior, concepts related to the energy use intensity of the structure, fire safety, etc), competent utilisation of standard details and efficient coordination of activities between the author of the architectural work and other professionals in the designing process. (Design studio - Bachelor's thesis of high degree competencies is shown in Figure 1 to Figure 5 - Bachelor's thesis, design studio - gallery; student: Viera Kopilcová, Pedagogue: Ing. arch. Yakoub Meziani, PhD).

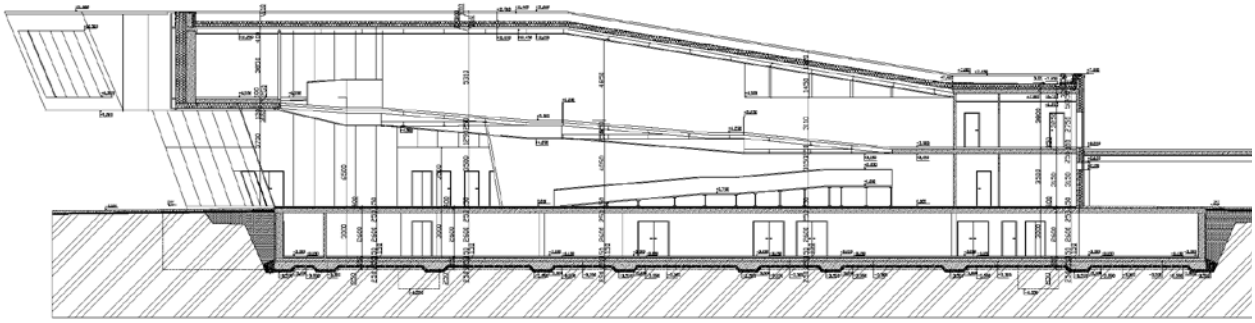

Figure 2: Cross section.

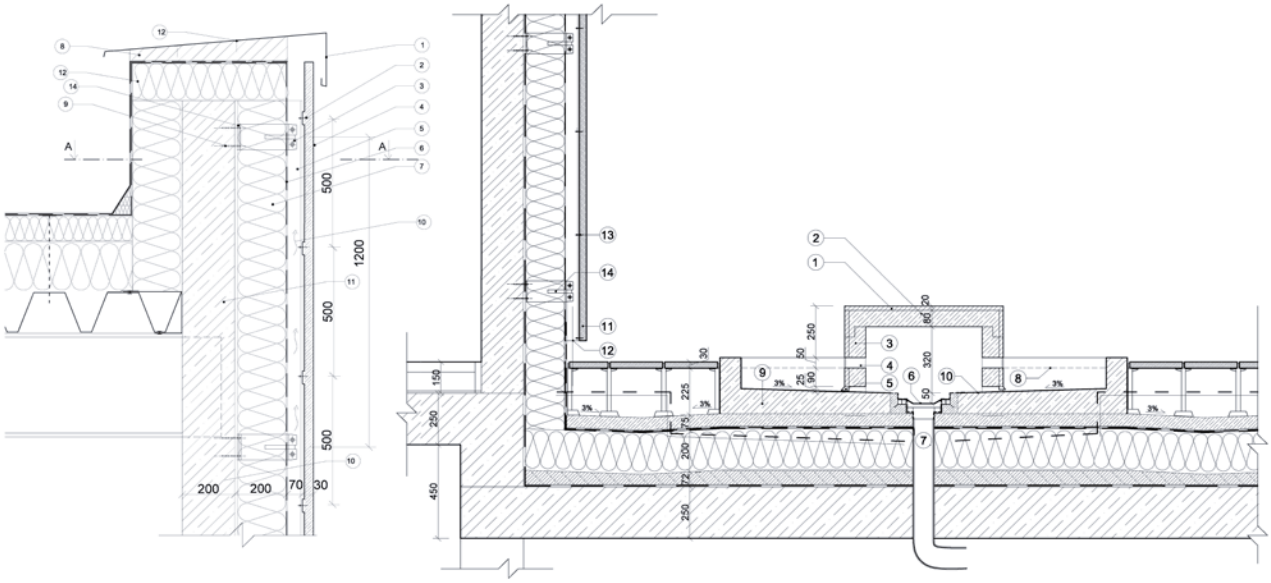

Figure 3: Standard details.

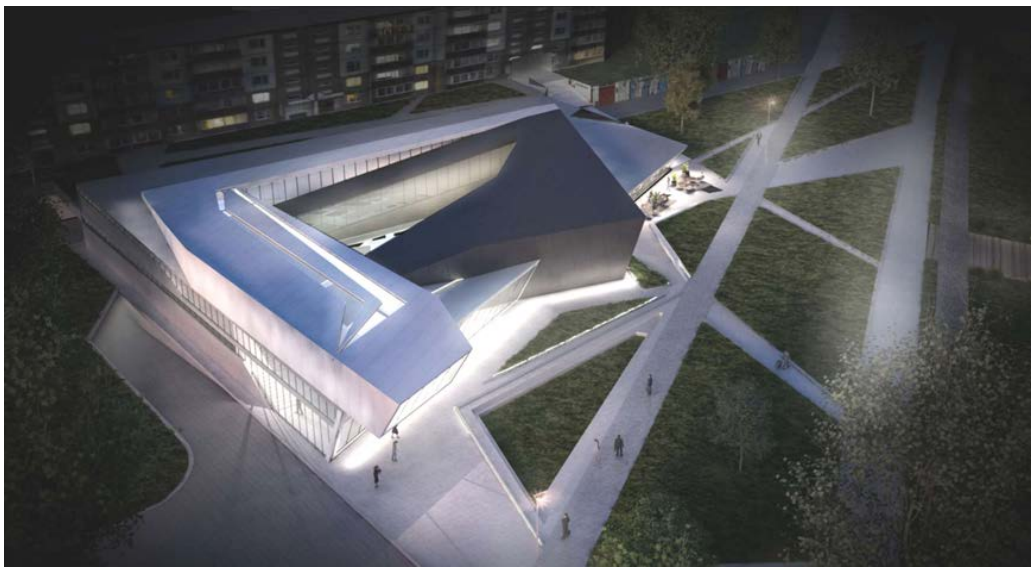

Figure 4: Architectural visualisation.

Figure 5: Architectural visualisation.

STUDENT COMPETENCIES VERSUS EDUCATION

Competency values in the education of a student-bachelor cannot be isolated from the competence of the pedagogue who is involved in the Bachelor's forming process. Competency is interpreted as an activity or a set of activities that characterise excellent performance in an area of the activity [6]. As purposeful behaviour in accordance with adequate competencies it establishes promising auspicious conditions for various work positions and functions and for handling difficult tasks. Preparation and learning [7], in this case in architectural education, are necessary to be able to develop competent and comprehensively prepared graduates.

The structure of subjects/courses of the Bachelor's programme at the Faculty of Architecture aims to equip students - Bachelors with appropriate competencies and skills. It can be argued that the competencies are in the *hands* of the university (and those of the teachers); they are defined by gradually increased levels of difficulty in a specific programme and in the subject/course information sheets. In principle, the school/university will provide the student with the relevant competencies (a perceptive student being an ideal case). In contrast, skills are *in the hands* of the students, it is up to the individual how they are to develop them further. The role of a pedagogue is to detect the skills and encourage the student to *soaring* to new heights of knowledge. A teacher with a modern approach is both a mediator and initiator [8]. Restrictions, similarly to competencies, are determined, and where competencies end, restrictions begin. They are associated with the hierarchy of education and continuation regarding competences for the Engineer's level of education.

The *competency* pyramid known from various areas of science and research (e.g. one has worked with the knowledge pyramid for a long time) can also be used in this respect. The top of the pyramid and the main objective is the education strategy. A system of acquiring competencies based on programmes is, thus, gradually available, by following the contents and objectives in specific study courses in particular fields of education. As to courses included in the architectural education, it is important to focus on three areas of skills (for development of competencies):

- Theoretical - the ability to formulate ideas and reasons for architectural assignments (e.g. social reasoning);
- Creative (architectural composition skills);
- Technical (technical interpretation skills).

This is closely related to the fact that competencies can also be perceived as an intersection of sets of: knowledge, skills and attitudes [9].

The aforesaid three areas are represented in different relative proportions in individual theoretical preparation courses. In designing courses, emphasis is placed on the creative area. The importance of this fact gradually increases in the Bachelor graduation year - the 8th semester of the studies, in the Bachelor's thesis, which is, to a great extent, a synthesis of a sort. University teachers assist in developing the intellectual potential of young people, for which purpose they have to adjust both their teaching methodology and content. The objective is to increase the mental and intellectual potential of young people [10]. The structure of the Bachelor's programme studies at the FA corresponds with the aim to *mould* graduates competent to proceed to the Engineer - Master level and also to be able to do their job in practice.

To be more specific, the basic tool used when searching for concepts (in general) in creative courses is sketching, rough drawing, drawing, later even modelling of physical representations [11]. The aforesaid process constitutes a part of expanding the creative competencies and trained abstraction skills, and is also necessary at the Bachelor's thesis level. The level of command of the specific graphic language used in architecture is determined primarily by the personality of a student in interaction with didactic pedagogical guidance [12].

As to the perception of competencies and the level/quality of university education from the perspective of the general public or in relation to other study programmes, the authors would like to mention research (although it concerns

the Engineer's degree, the results are interesting), in which the quality, results of technical, Engineer programmes are perceived positively and with respect, also when assessing and comparing various programmes [13]. The opinions on the erudition of graduates from the perspective of the general public (people they are in contact with) in our society is rather less optimistic. There is no simple solution to this problem and the authors of this article do not dwell on social causes of the situation. The article focuses on the presentation of competence of Bachelor's programme graduates and on demonstrating the quality of the educational content, which is undoubtedly a step towards improving the (public) opinion on the quality/level of education. The objective is to prepare a model of *student competency sheet* as

> *…the ability to utilize, in various contexts and activities, the system comprising knowledge, skills, abilities, social and cultural values, opinions, emotional and other personal qualities, which has a specific structure…* [14].

RESEARCH

The authors conducted research at the Faculty of Architecture of the STU with the aim of comparing the acquired competencies using the results of Bachelor's theses. The objective of the research was a comparison of the architectural output in the context of proficiency regarding construction and related disciplines. The intention of the project analysis was also to reveal the *level of diversity* of the designs, and to define *student* trends in preparation of building designs throughout the designing process. What did a sample of the analysed projects indicate? When summarising the results of the analysis of selected projects, the authors discovered facts indicating a high degree of variability of student projects as per individual topics, but also that the student projects reflected the relevant context of the objectives of the Bachelor's thesis in the Architecture and Urbanism course, and the actual results with the graduate's *competency profile* aspect. The confrontation of the research was conducted with emphasis on objectivisation of the comparison within the graduate's profile areas. One can also call it a *self-assessment* method for evaluating the teaching process at the Faculty and the acquired competency of its graduates. The methodology for individual student assessment is, pursuant to UIA requirements [15], based on three evaluation areas with the allocation of the degree of fulfilment as per the evaluation criteria:

1. Integral area of evaluation: composition, inventiveness and related influences in concept preparation (allocated points for fulfilment of criteria within the range of 1-5):

   - degree to which the student is able to transform/utilise the acquired theoretical knowledge and principles regarding the theory, methods and technique of the architectural and urbanistic designing process;
   - abilities and potential for utilising the studied information from the field of construction and technical disciplines and their influence on the architectural concepts, especially with respect to harmony of esthetical, operational and technical parameters of an architectural or urbanistic design and taking into account its impact on the environment;
   - degree to which the student capable to prepare, on their own, architectural studies of buildings and urbanistic studies;
   - degree to which the student is able to assess supporting documentation for the purposes of architectural or urbanistic designing process;
   - how much the student knows about legal regulations concerning the designing process and investment activities.

2. Integral area of evaluation: materiality and the load-bearing building construction design (allocated points for fulfilment of criteria within the range of 1-5):

   - level of conceptual designing of the structure *skeleton* of a building;
   - level of capabilities and skills with respect to preparation of building design documentation within the scope of the architectural documentation for application for planning and construction procedure;
   - ability to work on one's own and to coordinate the designing process with respect to relevant factors.

3. Integral area of evaluation: materiality and designing other structure and details, coordination (allocated points for fulfilment of criteria within the range of 1-5):

   - level of conceptual, construction and material designing with respect to auxiliary constructions;
   - level of conceptual, construction and material designing with respect to details.

Research results are presented in Table 1 and Figure 6.

CONCLUSIONS

The results have confirmed that students are hesitant to utilise non-traditional architectural shapes and atypical construction designs in their Bachelor's thesis/project, probably because they are not sure they will be able to *fine-tune* all non-standard details of the design/project. On the one hand, it is completely understandable, because a graduate -

Bachelor should primarily be able to deal with standard details, on the other hand, this fact should not hinder inventiveness. The analysis of selected works indicated preference for using traditional load-bearing constructions and materials; however, there was also a significant number of atypical layouts of the ground-plan grid and construction system structure. As to external wall designs, there is prevalence of current architectural trends in the form of transparent and translucent facades.

Table 1: Evaluating table of competencies/sample of students.

Selection of students in Bachelor's year 1 ... X	Rated abilities			Result
	Composition invention	Materiality and bearing structures solution	Solution of other structures and details	Rate of acquired competencies
Student 1	5	4	5	14
Student 2	3	3	4	10
Student 3	4	4	5	13
Student 4	4	5	5	14
Student 5	3	3	4	10
Student 6	3	4	3	10
Student 7	5	4	4	13

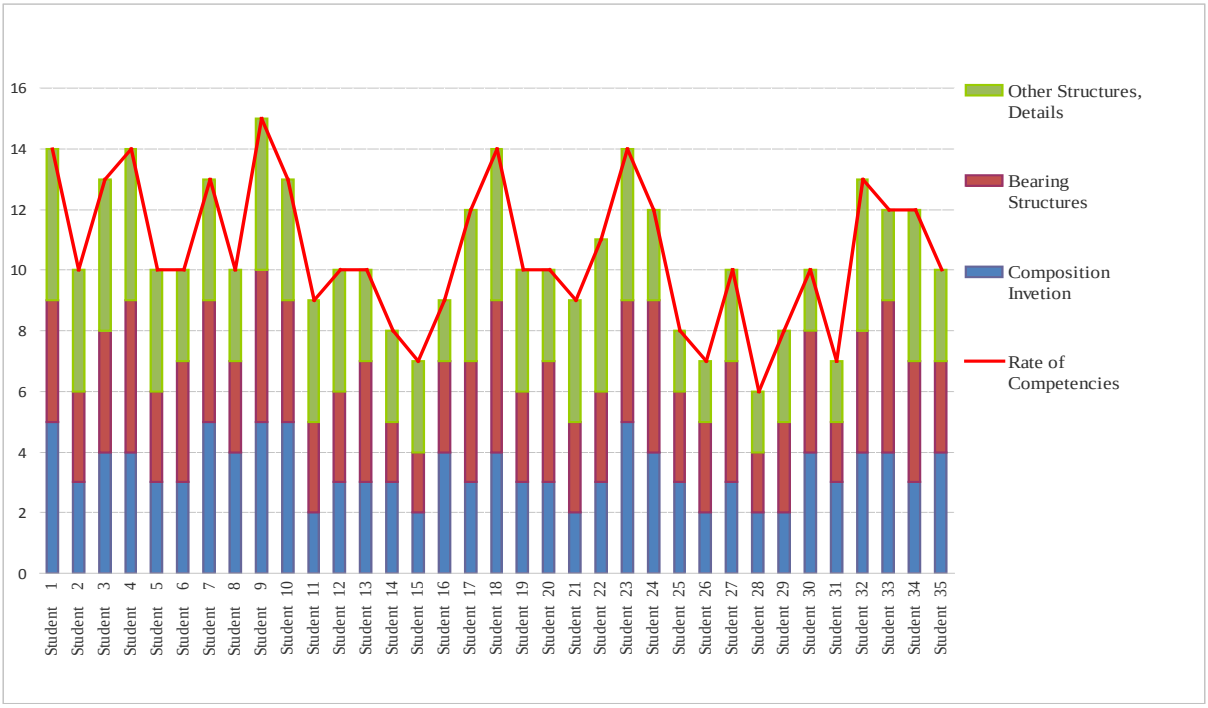

Figure 6: Graph of the acquired competencies.

The analyses are also informative with respect to the degree of progressiveness of solutions and actual mapping of the current architectural and material trends. From the conceptual solution perspective, the analyses confirmed gradual strengthening of incorporation of social beliefs of the graduates. An incentive for a different approach is the participation of the best works in a national competition for the best Bachelor's project/thesis, in which awards are given for projects with a higher degree of *deviation from the standard*. The result of the highest degree of synthesis of knowledge is high-quality output in the form of a Bachelor's thesis/project demonstrating high competency value of a Bachelor's programme graduate.

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BIOGRAPHIES

Ján Ilkovič graduated from the Faculty of Architecture at Slovak University of Technology in Bratislava in 1982, and in 1989 he completed his doctoral studies. In 1998, he was appointed an associate professor. Besides other posts, he is Head of the Institute of Construction in Architecture and Engineering Structures at the Faculty of Architecture of the STU (since 2006). Since 2010, he has held the post of the Vice-Dean for Education at the Faculty of Architecture of the STU. He is a member of the Scientific Board and a member of the Editorial Boards of FA STU. He has been the principal investigator of ten scientific projects focused on structural design, architecture of industrial and engineering buildings and conversion of old industrial buildings. Ján Ilkovič has introduced innovative teaching methods in courses focusing on structures in architecture. He has published four scientific monographs and dozens of scientific publications. He has actively participated in many international scientific conferences.

Robert Špaček completed his study of architecture at Slovak University of Technology in Bratislava in 1976. Between 1981 and 1982, he was a postgraduate student at the University of Hannover. He is a member of the Institute of Ecological and Experimental Architecture of the Faculty of Architecture of the STU, which he founded in 1990 together with Professor Julián Keppl. In his research, teaching and publication work, he focuses on sustainability, urban democracy and ethics, as well as architectural theory and review work. He is an author and co-author of dozens of scientific and popularisation texts, such as *Rukoväť udržateľnej architektúry (Compendium of Sustainable Architecture)*, *Solárne mestá (Solar Towns)* and *Efektívne bývanie (Efficient Living)*. He is a member of several scientific and publication boards and other boards and associations. Since 2010, he has been the Vice-Dean of the Faculty of Architecture of the STU for Research, PhD Study and PR.

Ľubica Ilkovičová graduated from the Faculty of Architecture at Slovak University of Technology, where she also completed her PhD studies in 1992. Since 1992, she has worked at the Faculty as a pedagogue. She has been an appointed associate professor since 2013 at the Institute of Construction in Architecture and Engineering Structures. She mainly deals with issues of production and engineering buildings, focusing on identity of architecture of industrial and agriculture production and conversion of old industrial buildings. She also teaches the topic in theoretical courses, as well as courses in architectonic design. Her scientific-research portfolio comprises three scientific monographies, more than 40 scientific publications. She has cooperated on more than ten scientific projects concentrating on architecture of production and structure in architecture. She has actively participated in many international scientific conferences.