

## AN ANALYSIS OF CURRENT TRANSFER OF ECONOMIC AND MANAGERIAL KNOWLEDGE IN THE PROCESS OF EDUCATION

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**Abstract:** *The paper aims to provide a view on current transfer of economic and managerial knowledge in the process of education, at the Faculty of Civil Engineering of the Technical University in Kosice. The students should learn necessary habits in the field of management and economics in construction, using obtained information. The article characterizes taught subjects where the students come into contact with the problems of management and economics in the building, during university studies. The objective is to show the number of subjects with focus on the economic and managerial knowledge in construction field. This paper presents a research, which deals with the teaching of these subjects in various stages of study for all faculties of civil engineering in Slovakia.*

**Keywords:** *managerial knowledge, economic knowledge, education process.*

**JEL Classification:** M15

### 1. INTRODUCTION (PURPOSE OF ARTICLE)

The paper deals with the analysis of cooperation between universities and practice, in order to show the current status of training courses in the field of construction. The linking practice with educational process of the study program Technology and management in construction is provided mainly through student experience, lectures by experts on specific companies, the introduction of current subjects in study programs and reaching out to practitioners for leadership of the bachelor and engineering works. This paper presents various forms of cooperation used by the Faculty of Civil Engineering in Kosice. On the basis of the cooperation in specific subjects, they have been created with the curriculum, so as to meet the practical requirements, in the preparation and construction management. The requirements of practice are discussed at various scientific and research publications [1;2;3;4;5;7]. In the framework of the educational process is possible to meet with different opinion about level of graduates some departments. Readiness of students in practice is very individual and also depends on the students themselves, from their efforts and from their attitude toward future careers. Many students work in the form agreement on temporary work during the summer holidays. For students it is a possibility to short time work in the construction departments. They can try application of theoretical knowledge in practice. Students are mostly placed directly into building production or to the department of the technical preparation of production. Students will receive directly the first knowledge about creating and controlling budgets. Most companies see deficiencies in absence of practical knowledge among students in this sector. Companies perceive that academics will derogate from the practice, which affects the knowledge of the students. In the article is presented the cooperation of university teachers and construction practice in the subject of the estimating and costing, which does not confirm the deficiencies. The study is aimed, among other areas also on areas of estimating of building and costing of building materials as

well as the gradual acquisition of knowledge and skills of estimating practice. Students can capitalize of the gained knowledge in practical training and transform them for obtaining skills for estimator office, assistant construction managers, and project managers or in other positions in investor and supplier organizations. Students acquire the necessary habits of estimating in the exercises, lectures from practice, in the subject of Construction site experience and completion of compulsory excursions. From graduate is expected, that they will have the all the skills as Estimator who have a few years of practice. But this is can not be obtained only with theoretical study, but only with a few years of practice.

### 2. METHODOLOGY

In this part of the paper are presented the selected subjects taught on Faculty of Civil Engineering in Kosice. The aim is to link the subjects taught with experience in the calculations, budgeting and pricing of construction work. For master students, who have completed these subjects, was created research about the number of taught economics subjects in their field. Poll was involved in two departments: Theory Buildings and Environment and the Department of Technology and Management in building industry. Characteristics of selected items:

#### Construction site experience

In this subject, student must participate in the three-week practice. The passing shall be evidenced with written confirmation from the responsible person and is necessary to draw up a report in a predetermined format. Originally, this subject was included only for students from the department for buildings implementation. After subsequent consideration of the lack of contact with practice, this subject was included in all the study programs. Students are enrolled as assistant construction managers. In this position, they are faced with the task of to study design documentation of the building and budget of course. Also, students have the opportunity to actually participate in the site diary entries, checking and acceptance of material,

controlling subcontractors, acceptance of works from subcontractors, participate in the inventory of the works and signing investigative protocols. Therefore, they receive many of these activities as observers in the second year bachelor's study. Also, the aim of the practice is to introduce students with the work and duties of an assistant construction manager and construction manager. The economic subject „Costs and Prices“ are follow-up in the third year of study.

### Costs and Prices

The goal is an explanation of the formation of bidding prices of construction works and emphasizing of creation of price variant of the construction process. In this subject is emphasis on the function of registration of the production factors and detection of building production efficiency. Students have to process right bill of quantities from the project documentation and acquaint with regularities calculation for any construction works. Students receive a database of the labor process, from which they draw budget lines for making budget of the family house. Some of the lectures are taught from company Kros, dealing with the creation program called CenKros Plus. CENKROS plus is the software for measurement and management of construction production. This system covers all activities associated with the preparation and realization of the contract. The program allows you to quickly create high-quality price offer, simply calculate costs, invoice of the work and prepare price estimates by budget indicators. The system is designed for budget designers, estimators, preparers, contracting authorities, designers and suppliers of construction works. At this stage of the study, the students are introduced with the program, but to better understand, the budget are compiled from simplified database of construction works and materials. Making the budget with CenKrosPlus software is taught at the second level of study in subject Budgeting and costing.

### Budgeting and costing

The students in this subject learn to handle the budget for the simple construction in software CenKros plus. This software is the most widely used in practice in Slovakia. Student receives basic knowledge of budgeting as search of the necessary items in the database of works and materials with average indicative prices. Subject highlights the importance of the calculation of own costs and calculated methods used in estimating building. It deals with the procedure and principles of construction budgets, production costing, production and sales invoices and monitoring of the consumption costs. Similarly as in subject „Costs and the prices“ in this subject is dedicated space for teaching lectures colleagues from practice (as the company Kros and CENEKON), but issues are focused on more in depth.

Institute of Technology and Management Building is also the organizer of scientific-technical conference Valuation and management of construction projects, which is held every year in Kosice. Conference aims to strengthen and mediate the exchange of knowledge and experience from practise, staff from research and development, universities and other educational institutions active in the construction industry. It is professional discussion and analysis of the strengths and weaknesses in the economy, valuation and

management of building projects (available on the Internet <http://www.svf.tuke.sk/orsp/>). The target groups of the conference are budget designers, estimators, preparers, authorities, designers, contractors of construction works, developers and employees of universities and secondary schools.

Also Institute of Technology and Management Building provides accredited course „Planning and management of the realization of construction projects for practice“. The course is intended for workers involved in activities related to the planning and management of the construction process. Course absolvents learn how to analyze the roles in the preparation and implementation of construction activities, and analyze the economic agenda and to orientate in the field of automated tools supporting the valuation, scheduling, and managing of the construction process. The course also opens the way for a variety of controversies and discussions about what is taught, what students know and what they should know. Oftentimes, in the course are enroll employees of companies (construction faculty graduates), who find out the importance of economic subjects in practice. They come with the statement, that subjects with a focus on economics and management are few, and those subjects which they graduated, they should put greater emphasis. On this basis, the Faculty of Civil Engineering has implemented a survey (Kozlovská, 2013) how many and what specific economic subjects are taught at various levels of study for all construction faculties in Slovakia. The findings from polls and surveys are presented in Chapter 3.

For students Full time master study, who have been subject to the budgeting calculations, was conducted research on the number of teaching hours in their departments. Polls were involved in two departments: Theory Buildings and Environment and the Department of Technology and Management in building industry. In the department Theory of buildings and environment (*TBaP*) was the last year of engineering studies. In the department Technology and management in construction (*TMS*) was the first year of engineering studies. Inquiry contained 3 questions, each question was possible to choose from three answers A, B, C. First question: What is the student's view on the need for the teaching of economics in your field (*TMS* or *TBaP*)? Answers: A – items are required, B – are required to a lesser extent, C - is necessary. The second question we asked: Do you think that the subjects focused on economics and management in your field is a sufficient number? A - Yes, B - The few, C- is endless. A third question was: Do you think that knowledge of the object budgeting and costing is useful in your work after graduation? A - yes I will use the knowledge in employment, B - Yes, I will use the knowledge in private life and C - the information about budgeting and calculations will not need.

### 3. FINDINGS

This chapter presents the results of the initial survey of realized how much and what concrete economic subjects are taught at various levels of study for all structural faculties in Slovakia [1]. The results are summarized in Table 1. In Table 2 is the number of objects directly towards the cost, price, calculated, budgeting, respectively controlling in connection with the budget.

**Table 1** The frequency of courses focused on economic and managerial skills

| DEGREE PROGRAM            | BUILDING |     |       | BUILDING CONSTRUCTION |     |       | STRUCTURAL ENGINEERING AND TRAFFIC CONSTRUCTION |     |       |
|---------------------------|----------|-----|-------|-----------------------|-----|-------|---|-----|-------|
|                           | Bc       | Ing | total | Bc                    | Ing | total | Bc  | Ing | total |
| <i>SvF TU Košice</i>      | 3        | 8   | 11    | 3                     | 0+1 | 3+1   | 2   | 1   | 3     |
| <i>SvF STU Bratislava</i> | 3+3      | 4+1 | 7+4   | 3                     | 0+1 | 3+1   | 1   | 2   | 3     |
| <i>SvF ŽU Žilina</i>      | 3        | 4+2 | 7+2   | 2+1                   | 2+1 | 4+2   | 1+1   | 2   | 3+1   |

Source: [6]

x+y ... compulsory subjects + optional courses (some of which are in the choice of subjects other fields, so that when the selection of these items reduces the number of articles addressing economic and managerial knowledge)

**Table 2** Frequency of courses focused directly on costs and prices (budgeting and calculated)

| DEGREE PROGRAM            | BUILDING |     |       | BUILDING CONSTRUCTION |     |       | STRUCTURAL ENGINEERING AND TRAFFIC CONSTRUCTION |     |       |
|---------------------------|----------|-----|-------|-----------------------|-----|-------|---|-----|-------|
|                           | Bc       | Ing | total | Bc                    | Ing | total | Bc  | Ing | total |
| <i>SvF TU Košice</i>      | 1        | 2   | 3     | 1                     | 0+1 | 1+1   | 0   | 0   | 0     |
| <i>SvF STU Bratislava</i> | 1        | 2   | 3     | 1                     | 0   | 1     | 0   | 0   | 0     |
| <i>SvF ŽU Žilina</i>      | 0        | 0   | 0     | 1                     | 0   | 1     | 0   | 0   | 0     |

Source: [6]

Results of surveys and responses to individual questions that were asked students after the course budgeting and costing are evaluated in tables (tab.3) and graph (Fig.1).

**Table 3** Number of replies from department TBaP a TMS

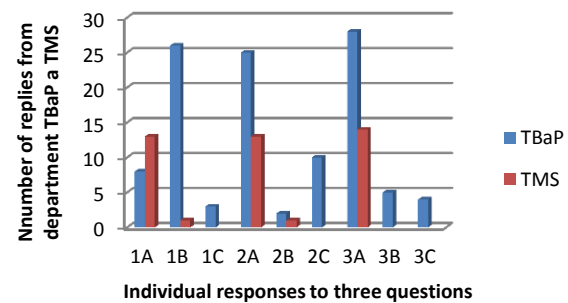
|    | TBaP | TMS |
|----|------|-----|
| 1A | 8    | 13  |
| 1B | 26   | 1   |
| 1C | 3    | -   |
| 2A | 25   | 13  |
| 2B | 2    | 1   |
| 2C | 10   | -   |
| 3A | 28   | 14  |
| 3B | 5    | -   |
| 3C | 4    | -   |

Source: author

Differences between departments resulting from their focus. Department TBaP focused on designing buildings are quite negative to the economic field. This is confirmed by answering to a question that economic subjects are required to a lesser extent (response 1B - 26 responses). On the question of whether the subjects focused on the economy sufficient amount, 25 students answered yes (2A - 25 responses) and 10 students said they wasted a lot of these subjects (2C - 10 responses). On the third question whether use of the knowledge of the subject budgeting and costing in employment after graduating 28 students responded positively (3A), 5 students answering that information will be used in private life (3B) and 4 students have said that such information is not needed any the sphere of his life (3C). Conversely, TMS department considers these objects as necessary (A1-13 responses), the number of economic subjects considered sufficient (B1-13 responses) and the whole department knows that this knowledge will benefit in employment (C1-14 answers.) Both unions are full-time study. It is to consider the attitude of future designers (Department TBaP), who do not care costs that the prospective investor to make the realization of a building which designed.

While the award for design work recommended SKSI (Slovak Chamber of Civil Engineers) set of ZRN (basic budgetary costs) building design coefficient and a performance phase of the project. If they are not interested in these costs, how can set the cost of the project? The investor is also always made of several structural variations, which almost always is at the top of

the costs of future construction, and it solved by the designer.



**Figure 1** Evaluation of the replies to the importance of instruction in economics at the Faculty of Civil Engineering in Kosice  
Source: author

#### 4. CONCLUSION

From graduate it is expected that it will have the necessary knowledge, but should not be expected to have all the skills to solve given tasks that can not be obtained theoretical study, but only a few years of practice. In addition to theoretical knowledge, it is necessary to provide students with the practical skills that are provided by hosting also lecturer practitioners in the field of pricing and budgeting. The vision is to further implement and seek new projects for further developing cooperation in higher education and practice and to clarify the importance of economic subjects for planners of building structures that were found to importance in practice. The vision of further education is undoubtedly continue to ensure the participation of practitioners on designing and developing curricula, lectures for students and university staff, promote the participation of university students to solve the most practical problems, cooperation in the excursions, internships and study tours, the management and assessment final works of students, university teachers participate in training staff of the partner organizations etc.

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