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Original Paper

Decision-making of students for their professional career in financial and insurance practice

Radomíra Hornyák Gregáňová[1*], Miriam Pietriková[2], Norbert Kecskés[1]

[1] Slovak University of Agriculture in Nitra, Faculty of Economics and Management, Department of Mathematics, Nitra, Slovak Republic
[2] Slovak University of Agriculture in Nitra, Faculty of Economics and Management, Department of Statistics and Operations Research, Nitra, Slovak Republic

ABSTRACT

The Faculty of Economics and Management of the Slovak University of Agriculture in Nitra provides students within bachelor's study programs with general theoretical and practical knowledge. In the first year of bachelor study students learn the basics of higher mathematics within the subjects "Mathematics IA" and "Mathematics IB". Students acquire practical and applied knowledge in the optional subject "Financial and Insurance Mathematics" taught in the third year of bachelor's degree. The paper deals with the questionnaire survey carried out in the subject "Financial and insurance mathematics" taught at FEM SUA in Nitra. The aim of the statistical analysis is to find out whether students' attitudes towards their professional orientation in the field of financial and actuarial mathematics have changed. During the academic years 2016/17, 2017/18 and 2018/19 students were asked to fill out an identical questionnaire aimed at finding their general overview in the field of financial and actuarial mathematics, as well as opinions on their professional future in any of these areas. Methods of descriptive statistics and hypothesis testing were used to evaluate the survey results. The existence of statistically significant relationships among the obtained data was verified by the χ^2-test. In case of dependence confirmation the intensity of assessed dependence was determined. The questionnaire survey confirmed the existence of statistically significant differences between the answers of students from different types of secondary schools and academic years.

KEYWORDS: teaching of mathematics, financial and insurance mathematics, questionnaire survey, statistics

JEL CLASSIFICATION: I 21, C12

INTRODUCTION

According to Novikov and Novikova [6] throughout the early 21st century the system of education has been changing all over the world, this is caused by numerous social and political factors, situation in the labor market and technical progress. Among the reasons for

[*] Corresponding author: Radomíra Hornyák Gregáňová, Slovak University of Agriculture in Nitra, Faculty of Economics and Management, Department of Mathematics, Tr. A. Hlinku 2, 949 76 Nitra, Slovak Republic, E-mail: radomira.greganova@uniag.sk

such changes are the rise of the interest in the higher education and an increasing prestige of degrees.

Education through different stages constitutes the primordial basis for the sustainable development of countries. It also constitutes an effective tool to reduce economic and social gaps through access to a decent work [2].

The transversal competencies are an essential part of the professional and training profile of most degrees, and they have been defined as generic aspects related to knowledge, skills, and capabilities that any graduate must have achieved to improve his transition and integration in the professional life [1].

In the contemporary society the university education is the important factor for employment opportunities on the labor market [8]. According to Drábeková, Pechočiak and Matušek [3] the business leaders and educational organizations are calling for new education policies that target the development of broad, transferable skills and knowledge. Országhová [7] said that graduates of the 1st education level at the Faculty of economics and management are prepared for various economic areas of economy and agriculture. For the graduates of The Faculty of Economics and Management of the Slovak University of Agriculture in Nitra (FEM SUA in Nitra) knowledge obtained in particular study programs and language competences create wide opportunities of application at different levels of business management in agro-food resort, companies of biological and technical services, businesses of foreign trade as well as business departments of companies in agro resort and in financial institutions. Students are educated also for the requirements of institutions of public administration and self-administration, consultancy companies, research departments and education.

Financial mathematics provides appropriate applications of mathematics in the financial area and analogically the insurance mathematics provides applications of mathematics in the insurance practice. Knowledge of financial mathematics enables more effective and rational manner of its use in borrowing or investing of financial means. Knowledge and methods shall be applied within job decisions but as well as in private decisions on finance assessment. Insurance mathematics provides better orientation in insurance products, possibilities and types of insurance and insurance practice in general [4]. Methods of financial mathematics can be applied in a lot of economic branches. Accounting, financial planning and decision making is the part of many professional courses and specialized subjects [5]. According to Papcunová and Gecíková [10] the quality of human decision making is largely contingent on their qualifications and experience.

MATERIAL AND METHODS

Financial and Actuarial Mathematics is a compulsory subject for the Quantitative Methods in Economics and an optional subject for the Accounting and Business Economics study programs. The course is attended every year by several dozen bachelor students of FEM SAU in Nitra. During the school years 2016/17, 2017/18 and 2018/19 these students were given an identical questionnaire aimed at finding their general overview in the field of financial and actuarial mathematics, and also at opinions on their professional career in any of these areas. The following basic methods of descriptive statistics and hypotheses testing were utilized in the assessment of survey results. The existence of statistically significant relations between acquired assessments was verified by mean of χ^2–test. Statistically demonstrated differences

in the assessment were based on the significance of testing (p-value), presenting the error probability which is reached when the H_0 hypothesis is rejected even it is true. In case the p-value of testing characteristic is lower than 0.05 (5.00 E-02), a null hypothesis about the equality of observed features is rejected and the difference in values of a statistical feature is considered as statistically significant. In our case we dealt with the statistical samples of range *n* and analysed two statistical features – the first studied character (A) was the type of secondary school or the school year in which the survey was conducted and the second (B) was one of the options to answer each question: Yes / No / Don't know. The statistics χ^2 is used as a testing criterion and is presented by the following ratio [9].

$$\chi^2 = \sum_{i=1}^{m}\sum_{j=1}^{r}\frac{(a_i b_j - (a_i b_j)_0)^2}{(a_i b_j)_0}$$

We tested the following null hypothesis H_0: There in no dependence between the observed features *A* and *B*. The alternate hypothesis H_1 as opposite: There is dependence between the observed features *A* and *B*.

RESULTS AND DISCUSSION

The questionnaire was filled out by 188 students. More than two-thirds (67.55%; 127 students) of these students were business or hotel academy graduates (Table 1). We can expect that these students will apply for jobs where knowledge of financial or actuarial mathematics is required. The structure of students from the perspective of the finished type of secondary school can be considered stable in case of grammar schools graduates and business or hotel academies graduates (Table 2). There is a statistically significant difference in case of another type of secondary school graduates when the proportion of such students has decreased.

Table 1 Structure of students according to the type of secondary school and form of study

Finished secondary school	School year			Total
	2016/17	2017/18	2018/19	
Grammar school	9.57%	9.04%	6.91%	25.53%
BA or HA	22.34%	21.28%	23.94%	67.55%
Other type of SS	2.13%	4.26%	0.53%	6.91%
Total	34.04%	34.57%	31.38%	100.00%

Source: authors' calculations

The survey also examined if students register an overlap in this subject with other subjects.

The questions, although in the whole survey formulated separately for financial and actuarial area, were answered by respondents in the same way. There were statistically significant differences between the responses in compared years (p-value 3.37 E-05 for "insurance mathematics" and 1.11 E-06 for "financial mathematics"). In school year 2016/17 positive answers prevailed, signaling the overlap of the subject with other subjects. After modification of the subjects' content due to the re-accreditation of study programs, the students' answers in

subsequent years changed, and the answers "*No*" prevailed in subsequent periods (p-value 0.11 for "insurance mathematics" and 0.95 for "financial mathematics").

Table 2 Results of mutual interactions determined in the survey

		Acquired assessment
		p-value
Have you experienced financial math tasks in practical life?	SS	6.83 E-01
	year	9.24 E-01
Have you experienced actuarial math tasks in practical life?	SS	3.18 E-01
	year	5.03 E-01
Have you applied anything from financial mathematics in practical life?	SS	6.20 E-01
	year	1.28 E-01
Have you applied anything from actuarial mathematics in practical life?	SS	7.37 E-01
	year	***0.47 E-03*****
Would you like to work in financial practice after graduation?	SS	1.27 E-01
	year	5.23 E-01
Would you like to work in insurance practice after graduation?	SS	1.13 E-01
	year	4.38 E-01

Source: authors' calculations

Table 2 shows the p-values to verify the existence of differences in respondents' answers to questionnaire questions divided by the type of secondary school (SS) and the year in which the survey was conducted. All p-values greater than 5.00 E-02 mean that there are no statistically significant differences in students' answers - graduates of different types of secondary schools. The structure of students' answers was the same in all compared time periods.

Statistically proven difference was found only in the answers to the question: "*Have you applied any actuarial math experience in practical life?*" In the analyzed time period, on average 50% of respondents chose a negative answer to this question. Less than 10% of students chose the answer "*I don't know*", except in the second investigated period, when this type of answer was more than a quarter (27.69%). This can be considered as the reason for the difference in the structure of answers.

CONCLUSIONS

The results of a repeated survey showed that Financial and Actuarial Mathematics overlapped with other courses, particularly in the academic year 2016/17. Based on these findings and also in connection with the re-accreditation of study programs, in the academic year 2017/18 an adjustment was made in the subject's curriculum, which also according to students' opinions, remedied these shortcomings in teaching. Transformation of the Basics of Actuarial Mathematics subject to the Financial and Actuarial Mathematics subject resulted in changes in the subject syllabus content, which reduced the overlap of the subject with other subjects taught within the bachelor study program at FEM SAU in Nitra.

Another important finding is that students' opinions on their professional implementation in the above mentioned areas do not change and a rather undecided or even negative attitude towards employment in areas using financial and actuarial mathematics prevails.

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