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Original Paper

Financial literacy of students of the Slovak University of Agriculture in Nitra

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ABSTRACT

In the paper we analyze with questionnaire survey which was conducted in the study subject "Basics of Insurance Mathematics" of the Faculty of Economics and Management (FEM) of the Slovak University of Agriculture (SUA) in Nitra. Financial literacy of students is the important part of the educational process at universities in Slovak Republic. The objective of the paper is comparison and evaluation of the financial literacy of students of FEM SUA in Nitra. The basic methods of the mathematical statistics and hypotheses testing were utilized in the assessment of the survey results. The existence of the statistically significant relations among the acquired assessments was verified by the χ^2–test. In case of dependence confirmation the intensity of assessed dependence was determined. The survey results found out that there is the influence of specialized subjects study on the students' perception and showed some significant interactions between studied knowledge and practical application.

KEYWORDS: mathematics, financial and insurance mathematics, financial literacy, questionnaire survey, hypotheses testing, χ^2–test

JEL CLASSIFICATION: I 21, C12

INTRODUCTION

The quality of higher education and the increasing competitiveness of universities are subject to continuous updating of the academic content as a result of interaction with the requirements for university graduates in the labour market [8].

Financial education is an important type of education. People come into contact and deal with the world of finance on a daily basis. Financial education is becoming a key aspect in decision making on all the issues related to our day-to-day life. The ability to understand financial

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products offered in a variety of forms or financial behavior itself both reflects the financial literacy of each of us [9].

A key element in people's decision making in all areas of their lives is financial literacy. Ability to understand financial products which normally people come into a contact is a reflection of financial literacy of everyone. General problem of society is inadequate level of financial literacy, therefore it is appropriate to search this issue in depth [12].

The subject "Basics of insurance mathematics" includes the fundamentals of financial and insurance mathematics. This subject is provided for accredited study programs Quantitative Methods in Economics as a compulsory subject and for Accounting as a compulsory optional subject. Financial Mathematics provides useful applications of mathematics in the financial field. Insurance mathematics provides the basics of actuarial methods and the most common types of insurance products in the life and pension insurance. Knowledge and methods of financial and insurance mathematics can be applied not only in the context of business decisions, but also in the private decision-making process in life. The inclusion of the subject "Basics of insurance mathematics" into context of education at FEM SUA in Nitra helps to prepare more complex graduates to practice [6].

The principal objective of the university study is to teach the students the mathematical apparatus and the methods of solving mathematical and application assignments that can be useful in the specialist subjects.
The assignments with the application elements have impact on:

- the students´ motivation to study also the theoretical methods of mathematics,
- development of students´ creativity,
- knowledge durability,
- connection of the mathematical theory and its practical application [10].

MATERIAL AND METHODS

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. The chi-square statistic is most appropriate for use with categorical variables, such as marital status [1].

Statistically demonstrated differences in the assessment were based on the significance of testing (p-value), presenting the error probability which is reached when the H0 hypothesis is rejected even it is true. In case the p-value of testing characteristic is lower than 0.05, 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 [11].

In our case we dealt with the statistical samples of range n and analyzed two statistical features – the first observed feature X presents student exam results classified according to study program and the second observed feature Y present the results of total assessment of student knowledge conducted in a regular term of before mentioned subjects.

We tested the following null hypothesis H0: There in no dependence between the observed features X and Y. The alternate hypothesis H1 as opposite: There is dependence between the observed features X and Y.

Pearson was looking for a simple statistic, a value that could be easily computed and that would indicate whether the results of an experiment deviated from expected results [2].

The statistics χ^2 is used as a testing criterion and is presented by the following ratio

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

The testing statistics χ^2 has the χ^2- division with the number of variance levels (m-1)*(r-1) under the validity of testing hypothesis H0. The testing hypothesis H0 is rejected on the significance level, if the value of testing criterion χ^2 exceeds the critical value $\chi^2(\alpha; (m-1)*(r-1))$. The critical value χ^2, respectively KH can be found in the table of critical values [7].

After dependence confirmation we have used Pearson correlation coefficient so called ϕ coefficient in order to determine the intensity of dependence. The intensity of assessed dependence is higher as the value of coefficient approximates to 1 [11].
Coefficient value is calculated as follows:

$$C = \sqrt{\frac{\Phi^2}{1+\Phi^2}} = \sqrt{\frac{\chi^2}{n+\chi^2}}$$

The program Microsoft Excel 2010 and SAS was used for the realization of calculations and determination of critical values, ϕ coefficients.

RESULTS AND DISCUSSION

Survey subject was to determine the financial literacy of students in FEM SPU in Nitra at the beginning of winter term before the graduation of subject “Basics of insurance mathematics”. The survey task was to find out what is the students financial literacy after the graduation of two years study in FEM SPU in Nitra in academic years 2016/17 or 2017/18.

The students of bachelor study which should graduate from the subject “Basics of insurance mathematics” were addressed by the questionnaire consisting of 13 closed questions and one open question. From the total number of 76 students 51 students were at daily study form (DS), thereof 35 students of study program Accounting (UCT), respectively 16 students of study program Quantitative methods in economy (KME) and 25 students of study program UCT in an external study form (ES).

In Figure 1 the educational respondents structure is presented where 65.79 % (50 students) of all students graduated the specialized secondary school like business or hotel academy (BA or HA) where as regards the school type we assume the graduation of specialized subjects with the emphasize on practical calculations. Other students from which 25 % (19 students) graduated gymnasium and 9.21 % (7 students) of other type of secondary school, probably the subjects of such a character were not the subject of graduation.

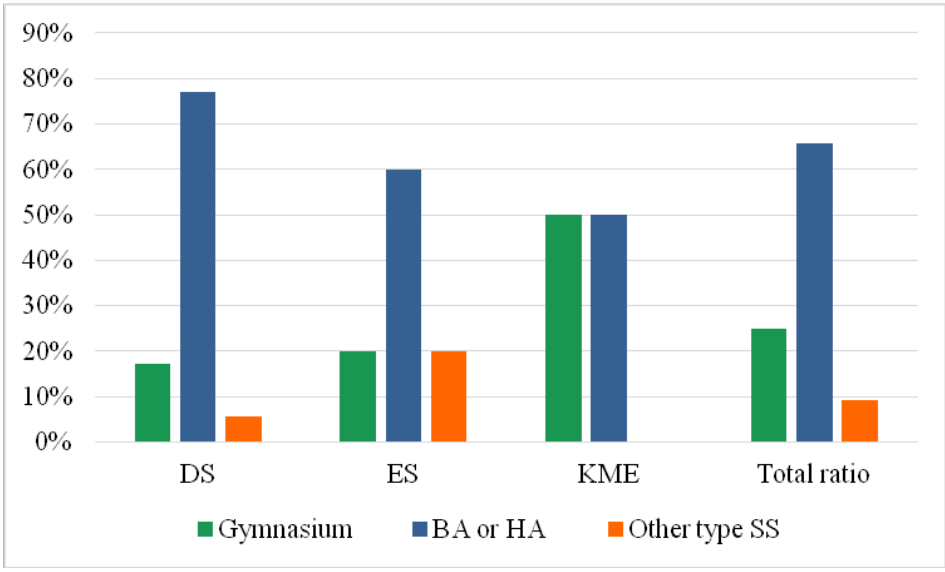

Figure 1 Respondents structure in accordance with the graduated secondary school

For the purpose of determination of respondents financial literacy level the survey was realized on the first lesson. As the subjects is include in the category of optional subjects, the fact was verified whether the students selected the subject based on the fact that they did not graduated the similar subject at the secondary school and the graduation of subject focused on the questions of financial literacy is considered to be relevant for them. The students' answers resulted in the following, 61 respondents (80.26 %) did not graduate the subject dealt with the issue of financial or insurance mathematics during their secondary school studies. Only three gymnasium students determined that this subject was graduated by them. During the secondary school studies almost 82.89 % (63 respondents), resp. 86.84 % (66 respondents) of students did not graduate the subject focused on financial respectively insurance mathematics (Table 1).

Table 1 Respondents structure in accordance with the graduation of financial and insurance mathematics

Subject graduation		Yes		No		Do not know	
		FM	IM	FM	IM	FM	IM
SS type	Gymnasium	4	3	14	15	1	1
	BA / HA	5	2	42	44	3	4
	Other SS	-	-	7	7	-	-
Total		9	5	63	66	4	5

Despite the before mentioned in average almost 64.47 % (49 respondents) respectively 57.89 % (44 respondents) of students answered the question whether they have already met with the tasks of financial respectively insurance mathematics in a practical life positively and 31.58 % (24 respondents) respectively 36.84 % (28 respondents) answered negatively. In the last part of questionnaire it was determined whether the students would be willing to accept the job offer in the area utilizing the knowledge of financial respectively insurance mathematics. After the study termination at FEM 55.26 % (in the number of 42) respondents

would accept the job offer with the use of financial mathematics and equally 22.37 % (in the number of 17) students would take negative or indecisive attitude towards the job offer in such an area. The job using the insurance mathematics would be refused by almost 52.63 % (in the number of 40) students and only 22.37 % (in the number of 19) respondents would accept such a job.

Table 2 Results of mutual interactions determined in the survey

		Acquired assessment	Value of testing statistics	Pearson correlation coefficient
		p-value	χ^2	**ϕ coefficient**
Subject graduation at SS vs. application in a practical life	FM	**0.0058**	14.5298	0.4372
	IM	0.0625	8.9436	0.3430
Subject graduation at SS vs. job after the study termination with use	FM	0.9323	0.8448	0.1054
	IM	0.1284	7.1462	0.3066
Experience in a practical life vs. job after the study termination with use	FM	0.1429	6.8697	0.3026
	IM	0.0423	9.8895	0.3607
Knowledge application in a practical life FM vs. IM		**1.29 E-06**	43.7327	0.7586
Willingness to work after study termination in the area utilizing FM, resp. IM		**4.58 E-07**	34.3586	0.6724

By a more detailed analysis of survey results and investigation of mutual interactions between selected respondents answers it was determined that there exists the influence of specialized subject graduation on the students perception whether there have occurred some needs for application of knowledge from these subjects in a practical life. The survey approved the ability of students to correctly identify the application of knowledge from before mentioned subjects in a practical life (p-value = 0.0058). Simultaneously the willingness of future graduates to work in such an area where the knowledge of financial mathematics is used was observed. The vision to work in observed areas is only slightly influenced by the fact whether the students graduated the subject with the content focused on financial mathematics at the secondary school (ϕ coefficient equals 0.11) or they stated that in their practical life they met with the tasks of before mentioned issue (ϕ coefficient equals 0.3). While observing the similar relations in the insurance mathematics we can state that there exists medium strong dependence between the respondents' answers when ϕ coefficient obtains the value equaling 0.31, resp. 0.36 (Table 2).

Mathematics and its methods have multilateral application in specialized subjects of economics. The topics from the areas of finances and investments represent an interesting and important part of mathematical applications and can improve students' financial literacy [3].

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 [4].

It is important to acquire key competences which they will use in future practice. The lifelong learning programs can be aimed at acquiring language skills, communication skills, diplomatic protocol and social literacy, computer literacy, legal issues, management and marketing, economics, finance and accounting, and so on [5].

CONCLUSIONS

Graduation of specialized subjects at all levels influence the increase in the financial literacy of population referring the correct identification of situation in a practical life which presents the basis for correct decision making.
The survey resulted in the fact that almost 63.27 % of students, who met with the financial mathematics in a practical life, were interested to work after their study termination in a financial area where the obtained knowledge is applied. Vice versa 61.36 % of students, who met with the insurance mathematics in a practical life, would refuse to work in an insurance area after their study termination.

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