Original paper

Some notes on the financial literacy of the Slovak students – Case study

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ABSTRACT

We deal with financial literacy, because we believe that everyone of us should be financial literate. We used The National Educational Program ISCED 3a Mathematics and we prepared tasks for Slovak students in grade 10. The examined group consisted of students in grade 10 and students in grade 12 of Piarist High School in Nitra and the first-year students of the Faculty of Economic and Management of the Slovak University of Agriculture in Nitra. Students solved the tasks focused on the ability to compare discount products, calculation of value added tax, calculation of income tax, insurance contributions and net salary. Their knowledge was insufficient. Students knew assess profitability of purchase (problem1), but they did not already know calculate VAT (problem2), income tax, insurance contributions and net salary (problem3).

KEYWORDS: financial literacy, tasks, high school students, university students, Slovakia

JEL CLASSIFICATION: F83, F84, M33

Money is one of the many things that affect quality of our life. In a positive or negative way? It depends on the financial literacy of each of us. What is financial literacy? Financial literacy is the set of skills and knowledge that allow you to understand the financial principles you need to know to make informed financial decisions and the financial products that impact your financial well-being [10] and financial success each of us. Despite of that nowadays almost everyone uses financial products surveys show a low level of financial literacy of the population. The survey of financial literacy of the Slovak Banking Association conducted in 2007 [3] pointed out that most bank customers have a low ability to analyze and process of information available, mainly due to misunderstanding of basic financial terms.

Financial education should provide sufficient knowledge and tools that would lead to a better understanding of financial products and terms, so that we make the correct decisions [3]. The initial document for incorporating financial literacy into the school education programs is The

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National Standard of Financial Literacy [4]. This document defines financial literacy as "the ability to use knowledge, skills and experience to effectively manage their own resources to ensure lifelong financial security of yourself and your household". This document has been updated to version 1.1 in September 2014 [5]. At that time methodology was also developed for incorporation and application of financial literacy topics into The National Education Programs ISCED 2 and ISCED 3a. According to these documents [7] pupils primary school should know concepts: principal, simple interest, rate of interest, exchange list, foreign currency. High-school students deal with financial mathematics in the 1st and 2nd year. In the first year of study, they learn [8] exchange rate, foreign currency and elementary financial mathematics of households (deciding on the benefits of purchase or sales, insurance, various types of taxes and their calculation, account statements and invoices). In the second year of study, they learn to count basic tasks simple and compound interest, to understand the principle of loan repayment, to compare the profitability of two loans by calculating the interest rate in simple cases [2], [8].

MATERIAL AND METHODS

The examined group samples consisted of the students of the Piarist High School in Nitra (PHS) and the students of Faculty of Economic and Management of the Slovak University of Agriculture in Nitra (SAU). Sample sizes are shown in the table 1.

Table 1 The numbers of students participating in research

Students in grade 10 PHS	Students in grade 12 PHS	First-year students SAU
41	45	53

Tests were ready for students in grade 10. We use The National Educational Program ISCED 3a Mathematics. Three tasks were in the test (fig.1). Students solved the tasks focused on the ability to compare the discount product (problem1), to calculate value added tax (problem2), to calculate income tax, insurance contributions and net salary (problem3). Students solved the test for 20 minutes and they were allowed to use a calculator. The maximum number of points that a student could get was 11 points (3+4+4) in Test A and Test B.

RESULTS AND DISCUSSION

Student scores in each of the task we expressed by percent. The percentage of task solution in each researched group is shown in table 2.

Problem 1

"Eliska and Karol were going to ski and they need new skis. During the year, the price skis together with ski boots was 266 € in some sports store. A month before Christmas, these skis were marked 20 % off. So, Karol bought them. Two weeks before Christmas, the price tag was indicated: original price 266 €, sale price 173 €. Eliska bought them at that time. Whose purchase was preferable and why?"

Students of all three researched groups were successful in solving this problem. Maximum score (3 points) was obtained by 39 students in grade 10, by 39 students in grade 12 and by 52 first-year students (Table 2).

Table 2 Results of problems solution (%)

	Points	Students in grade 10 PHS	Students in grade 12 PHS	First-year students SAU
Problem1	3	95	87	98
	2	5	7	2
	1	0	4	0
	0	0	2	0
Problem2	4	7	47	4
	3	5	11	0
	2	2	7	2
	1	80	29	77
	0	5	7	17
Problem3	4	17	24	36
	3	5	18	2
	2	27	29	17
	1	27	11	32
	0	24	18	13

Problem 2

"Marian has gone shopping. He bought: jacket for 53 € in a sports store; drugs for 4.20 € in pharmacy and atlas animals for 12.50 € in bookstore. Calculate how many euros will be paid through his purchases to the state budget of the Slovak Republic in the form of VAT?"

Researched students were not very successful in solving this problem. Maximum score (4 points) was obtained only by 3 students in grade 10, by 21 students in grade 12 and by 2 first-year students (Table 2). For the successful resolution of this problem it was necessary to know the tax, which is currently 20 %, but the books and medicines only 10 %. The most common mistake students were stereotyped determination the price of the products at 100% [2] because a percent is a ratio of a number to 100. But the prices in Slovakia are reported already including of VAT, so the price of the product is a 120 % respectively 110 %. Before the test, we repeated these facts for students in grade 12 which was probably cause of an increase in the success of solving this problem (47%) in this sample.

Problem 3

"Angelika has a monthly gross salary 900 € in new job. Calculate her income tax (19 %), insurance contributions (13.4 %) and her net salary. In 2014 was the monthly non-taxable amount 311.32 €."

Researched students were not very successful in solving this problem. Maximum score (4 points) was obtained only by 7 students in grade 10, 11 students in grade 12 and 19 first-year students (the percentage shown in Table 2). Students have done a lot of different mistakes in solving this problem. For the successful resolution of this problem it was necessary to know the calculation of the tax base and of monthly tax advance (19 %). The tax base is "gross salary – (health and social insurance + non-taxable minimum)". The most common mistake of students was calculation monthly tax advance out gross salary. Another mistake was wrongly calculated health and social insurance in the amount of 13.4 % because students did not use for calculation gross salary. Many students added together insurance contributions and income tax, and then they calculated net salary by subtracting 32.4 % from the gross salary.

One of the main aims of mathematical education is preparing the students for dealing effectively with the real-life situations [9]. Real-world connections are expected to have many benefits, such as enhancing students understanding of mathematical concepts, motivation

mathematics learning, and to help students to apply mathematics to real problems [1]. The tasks in the tests were set so that solved the real-life situations.

The percentages are taught in grade 7. The concept of percent is one that occurs daily in our lives [6]. For example, stores often sell goods for a discounted price. Typically, a store will discount an item by a percent of the original price. Is something on sale, advertised at "so much" percent off? How much is it going to cost? These are all questions that researched students would know answer with respect to successful resolution of the Problem 1.

A value-added tax (VAT) is a form of consumption tax. From the view of the buyer, it is a tax on the purchase price. From that of the seller, it is a tax only on the value added to a product, material, or service, from an accounting point of view, by this stage of its manufacture or distribution. The standard VAT rate in the Slovak Republic was increased to 20 percent in 2011, but drugs, medical supplies and books are subject to a reduced rate of 10 % in 2014. We found that students do not know calculate VAT (see problem2 in table2). To calculate VAT you should divide the gross amount by 1 + VAT percentage (i.e. if it is 20 %, then you should divide by 1.20). For example: VAT = the price of products /120 x 20. This fact many of researched students did not know it.

Terms of gross respectively net salary or income tax are taught in grade 10. Greater interest of students in this issue is resolutely connected with their first experience with salary from occasional part-time job. Percentage of the correct solutions of this problem was rising with age of researched students (see problem3 in table2). It is especially related to possibility of students to find a job. If the student wants to find a job, then according to the Labor Code he must satisfy two conditions: reached the age of 15 and finished of compulsory education (10 years).

CONCLUSIONS

Let's try to answer the question: "is really necessary to deal with the financial mathematics at primary or secondary school?" Definitely yes. Pupils make use of money almost daily. Even though the problems of the tests, pupils meet almost daily, their knowledge was insufficient. Students knew assess profitability of purchase (problem1), but they did not already know calculate VAT (problem2). Despite the fact that this problem also related to purchases because VAT is calculated on each bill. Percentage of correct solutions of the problem of gross and net salary was rising with age of researched students (problem3). We have a document for incorporating financial literacy into school education programs of a good quality in Slovakia. But we think that it is necessary to more motivate students to learn topics of financial literacy. We also think that the transfer of some topics of financial literacy between grades should help to better knowledge of students. For example, themes of gross respectively net salary or income tax it might be teach in grade 11 or 12, when the students have first experience with salary from occasional brigade.

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