



FINANCIAL LITERACY OF THE MANAGEMENT STUDENTS AND DURABILITY OF THEIR KNOWLEDGE

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Abstract

This paper deals with the issue of financial literacy of university students. The research focuses on students in managerial fields of study for whom financial literacy is an important part of their professional profile. The analysis of financial education at universities is conducted in terms of the efficiency of this process and the durability of the acquired skills. In particular, the aim was to verify the durability of knowledge gained during financial education. The level of financial literacy of students was verified by the method of the questionnaire survey which took place in two cycles. The first round has run immediately after completing the financial course and it was repeated in the second round after a half-year time interval when the education was interrupted. The authors analyze the impact of the forgetting process by the statistical comparison of the research samples they obtained in these repeated surveys. In addition to professional questions, some self-reflective characteristics of respondents were obtained. These data have enabled analyze the causes of rapid forgetting or, conversely, maintaining or increasing knowledge. Through the self-reflective assessments of the respondents, it became clear that the importance they attach to financial literacy is a decisive factor in maintaining the competences acquired.

Keywords: education in management, financial literacy, statistics

1 INTRODUCTION

New technologies help us in different areas of life, but our lives become increasingly complex. Much more knowledge of financial and investment decision-making is needed than our parents needed. It is difficult to make informed decisions

on new financial products and digital financial services that bring new types of risks. Financial markets offer many new products that are difficult to understand. The digital environment has simplified access to new products that are increasingly attracting small investors. We simply live in conditions heavily marked by globalization that have little resemblance to those of 30 - 40 years ago. As individuals, we have greater responsibility for saving, investing and accumulating pension funds. The population of the

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EU countries increasingly bears the burden of financial security for pensions and, in particular, the possible consequences of their own financial decisions in managing their assets. Household over-indebtedness is a common phenomenon in all European countries. That is why the phrase "to achieve financial stability" from the mouth of young and old generations is often repeated today.

One of the key factors in maintaining financial stability in a person's professional and personal life is a sufficient level of his/her financial literacy. After all, most of our decisions have a financial context. The decisions that affect us the most and determine the ability to achieve financial stability we make only a few times in our lifetime. These are decisions on long-term investments (such as retirement plans), debts (selecting the most appropriate way of financing housing), their structure and volume, which would take into account real household income. More frequently we decide, for example, whether to move to better job opportunities or not and also the possibilities of exploiting life and property insurance. People make these decisions at a young age when they have little life experience and lack quality - contemporary and applicable today - knowledge and skills from financial literacy.

The advancement of technology and the impact of robotics require constant updating of knowledge and competences to a certain level of quality, not only for young people. Financial literacy and financial education are therefore still a problem. Financial literacy is not isolated literacy; is related to a range of soft skills and other literacy. The aim of financial literacy that is taught in schools is to help young people understand financial matters because it is the young generation who are in contact with increasingly complex financial products and services. As we observe progress in information technology and increasingly complex financial products, we can realize that young people are more likely to bear greater financial risk than their parents.

The education system and universities face an important challenge: to improve the financial literacy of the younger generation through financial education in the upcoming smart society. In a smart company, it is very easy to manage complex and sophisticated financial instruments, both investment and credit. It is possible to get

a loan easily and very quickly with one mouse-click, but it is no longer so easy to repay. It is easy to get an investment, but it is difficult to bear the risks associated with it. Therefore, financial literacy will become a necessity for life and survival in a smart society. This is such a "SMART" that carries a new framework for everyday life and especially for the financial decision-making of everyone, as well as the management of the company, to be prepared for.

The aim of our research was to verify the level of financial literacy of university students, the effectiveness of financial education in terms of its impact on the level of financial literacy and the persistency of these competencies. In the current paper, we present an analysis of the durability of acquired knowledge and competences. We analyze the impact of some elements of self-reflection on the retention and eventual improvement of acquired skills or their decline. The results of this analysis then enable us to state certain principles on the content and course of financial education.

2 LITERATURE SURVEY

The European Commission defines financial literacy as "the capability of consumers and small business owners to understand retail financial products with a view to making informed financial decisions" (Habschick, Seidl, & Evers, 2007). OECD has defined financial literacy in a wider sense and more generally "is a combination of understanding, knowledge, skills, attitudes and behavioral patterns necessary to make the right financial decisions and, ultimately, to achieve personal financial well-being" (OECD & INFE, 2011). Our research is based on the definition of a financially literate person, how it was published in (Kozubikova, 2015) "It is a person who uses his ability to make a qualified judgment on the basis of the knowledge, skills and experience gained thus enabling him to smooth financial security throughout life." A financially literate person prefers to plan financial flows, which leads to more uniform consumption throughout life, depending on the life cycle.

Interesting results were brought by the study of the authors (Nicolini, Cude, & Chatterjee, 2013). The purpose was to understand whether factors linked to financial literacy in one country could be

generalized to other countries or whether, due to the unique national characteristics, it was necessary to examine financial literacy in each country individually. The results indicate significant differences between countries, suggesting that there are national and cultural differences in what households know and need to know about their personal finances.

Here are many studies suggesting low financial literacy among young and low-educated people. The contribution of research (Agarwalla, Barua, Jacob, & Varma, 2015) is represented by the results that reflect the behavior of specific demographic and socio-economic groups and subsequent research of their investment behavior, accountability, risk-taking, and insurance use. It has been confirmed that financial literacy is closely related to the socio-demographic characteristics and financial burden of the family. How stated in (Lusardi, Mitchel, & Curto, 2010) "Financial literacy was strongly related to sociodemographic characteristics and family financial sophistication". A strong positive relationship between financial literacy and household wealth is reported in (van Rooij, Lusardi, & Alessie, 2012), which confirms that money management skills contribute positively to the net wealth of the household. Moreover, the results of this study have shown that financial knowledge increases the likelihood of investing in the stock market, allowing individuals to benefit from the equity premium. It further proved, financial literacy is positively related to retirement planning and the development of a savings plan has been shown to boost wealth.

There is scope for young people to learn and acquire financial decision-making skills at all levels of the education system. We see evidence that verifies the close relationship between financial education and financial literacy. How to introduce (Lusardi & Mitchell, Financial Literacy and Retirement Preparedness: Evidence and Implications for Financial Education, 2007) "Around the world, financial education has become an important tool to tackle the growing complexity of financial decisions, especially in the life of the last generation." Part of the research is solely aimed at university and college students. In recent years, they have introduced programs to increase student financial literacy in order to improve their students' quality of life and thus

reduce their failure to repay student loans, see for example (Boyland & Warren, 2013). In order to identify the actual state of financial literacy of students and subsequently targeted financial education to address the shortcomings, the students' basic knowledge of income, money management, savings, expenses, and loans is analyzed. It is examined how much of the students is financial literate also in relation to risk tolerance and investment preferences.

The authors (Kozubik, Kozubikova, & Rybicka, 2017) also take into account the previous education at the secondary schools of respondents in financial literacy and the way of verifying skills. This survey also includes the respondent's self-assessment of the state of their financial literacy, the importance they attach to financial literacy and how they proceed when making important financial decisions.

The overall picture of financial literacy would not be complete without examining socially disadvantaged groups of the population, where financial literacy can explain a significant part of property inequality. (French & McKillop, 2016). The links between financial education and financial literacy are also confirmed by studies (Fernandes, Lynch, & Netemeyer, 2014) or (Lusardi, Yakoboski, & Oggero, 2017). These studies also confirm that financial literacy can be improved by high-quality financial education, which applies to all levels of the education system.

3 METHODS AND DATA COLLECTING

We obtained the research sample by the method of the questionnaire survey. Questionnaires were distributed among students three times. In the first phase, we examined the financial literacy of a wider group of university students in Slovakia and the Czech Republic. We have continuously published the results and analysis of this survey (Kozubikova, 2016), (Kozubik, Kozubikova, & Rybicka, 2017) and (Kozubik, Kozubikova, & Polak, 2019). For the second and third phases of the survey, we selected a narrower group of 200 management students. This choice was motivated in particular by the fact that we can rightly assume that financial literacy is going to be an organic part of their professional skills. The second phase of data collection took place immediately after the

end of the course, which included elements of financial literacy. At this stage, we verified the effectiveness of financial education and we published the results in (Kozubikova, 2017). The purpose of the third phase was to verify the durability of the acquired skills and competences. This third repeat survey was therefore carried out with a six-month shift after completing the course.

The questionnaire itself consisted of two parts. In the first part, we examined some personality characteristics and questions about respondents' self-reflection. The second part focused on the level of financial literacy. The problems were presented as multiple-choice questions with four response options. Only one of the options was correct, two options were incorrect and one of the options was the "I don't know" answer. The general concept of financial literacy we have structured in four disjoint areas:

- Time value of the money and inflation perception.
- Annuities and debt repayment.
- Investments and risk.
- Financial decision making.

We then assessed the financial literacy of individual respondents according to the percentage success of their answers.

To compare the results of individual surveys we used standard statistical methods. Specifically, to compare the average percentages in each round, we applied the Student's t-test for the hypothesis that the mean values of both samples are equal. As the variances were different in each set, we used the Welch modification of the t-test.

Since in some cases the tests did not allow us to reject the hypothesis of equality of mean values at the required level of reliability, we used empirical cumulative distribution functions and we compared the distributions by the stochastic dominance rules. The notion of stochastic dominance defines a partial ordering between the random variables. For our purposes, we applied the first order and second-order stochastic dominance rules.

Let X and Y are two random variables with the cumulative distribution functions $F_X(x)$, and $F_Y(x)$ respectively. We say that X dominates Y (in the sense of the first-order stochastic dominance) if $F_X(x) \leq F_Y(x)$ for all x , where a strict inequality holds for at least one x . Expressed by the

language of probabilities it means that $P[X \geq x] \geq P[Y \geq x]$ for all x and the strict inequality $P[X \geq x] > P[Y \geq x]$ holds for at least one x . So, expressed by words, the random variable X tends to reach higher values than random variable Y .

Stochastic dominance of the second order is also defined in terms of cumulative distribution functions. Instead of a direct probabilistic interpretation of the cumulative distribution function, the functions $F_X(x)$ and $F_Y(x)$ are required to fulfill the inequality

$$\int_{-\infty}^x |F_Y(t) - F_X(t)| dt \geq 0,$$

for all x , with strict inequality at some x . The integral in the inequality can be interpreted as the cumulative area bounded by the graphs of the distribution functions where the areas have opposite signs depending on which of the cumulative distribution function approaches greater values. The random variable X dominates Y if the area always remains non-negative.

4 RESULTS

Overall, we have distributed 200 questionnaires among the students in each of the two rounds. The questionnaires have been distributed twice because our aim was to verify that financial literacy skills have a descending tendency when education is interrupted. The first round had run immediately after finishing the course and the second round with the half-year delay from enclosing the course. After sorting the questionnaires and removing the questionnaires with malicious or incomplete responses, we obtained a sample of 162 questionnaires. This means that the response rate was 81%.

Before we proceed to analyze the influence of the time delay factor on the level of financial literacy, we briefly evaluate the changes in the importance of perceiving and in self-reflection. The results are presented graphically on the pie charts in figures 1 and 2.

From Figure 1 it is easy to see that immediately after completing the course, no respondent considered financial literacy to be of little importance or even unnecessary. However, if we look at the results at a half-year interval, we see that the proportion of those respondents who perceive financial literacy as very important, or

even vital, has remained with a positive shift to the vital classification. On the other hand, in the group that attributes financial literacy, groups of those who consider it less important or even unnecessary have separated.

times from 2.2% to 7.1%. In addition, the proportion of students who rated themselves as poorly literate was reduced to less than half from 4.4% to 1.8%. In addition, almost one-half assesses their skills as above average. How we will see from the results, such self-confidence is unjustified.

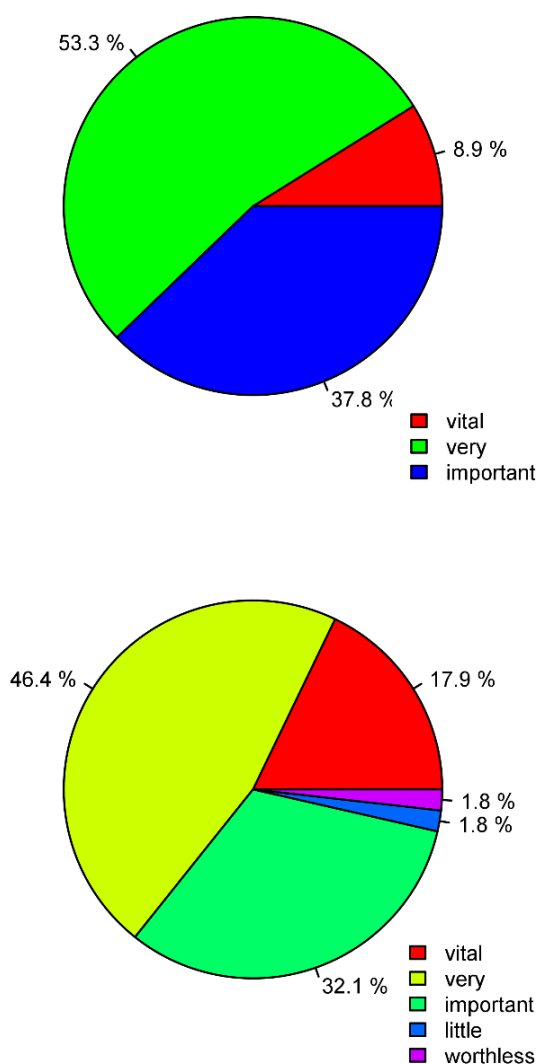


Fig. 1 The percentages of respondents by their importance perception of financial literacy. In the upper pie chart shares immediately after absolving the course, in the lower pie chart shares with the half-year delay. (Own elaboration)

Similarly, some structural changes can be observed in the area of self-assessment. As we can see in the graphs in Figure 2, immediately after completing the course, respondents were more self-critical. After some time delay, they are becoming less aware of their shortcomings. We can see that the share of those who feel fully financial literate has increased by about three

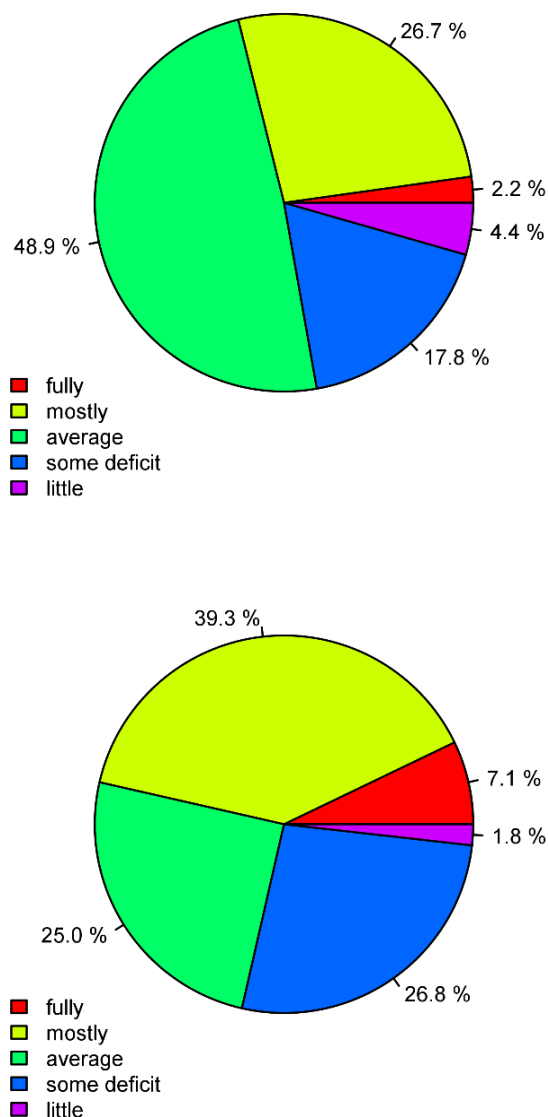


Fig. 2 The percentages of the respondents according to their self-appraisal of their own financial literacy. The upper graph immediately after finishing the course, lower with the half-year delay. (Own elaboration)

As mentioned above, we measured the level of financial literacy as a percentage of correct answers in the test. Table 1 shows the basic

numerical characteristics of the samples obtained in each round of testing. To compare the shift in knowledge, we also summarize in Table 2 the selected quantiles of these samples. From the values in Table 1, it is clear that the results immediately after the end of the course show a negative skewness and the resulting success percentages accumulate in above-average values. This is also confirmed by the lower level quantiles in Table 2. However, there is also an increase in the value of higher-level quantiles as well as a maximum success percentage. We will reveal the cause of this shift later in analyzing the results according to perceiving the importance of financial literacy.

Table 1. Essential sample characteristics of the percentages of the correctly answered questions immediately after completing the course and with a half-year delay. Source: Own elaboration.

When measured	Immediately	Half-year delay
Minimum	30.7%	7.69%
Median	53.85%	46.15%
Mean	50.94%	18.04%
St. deviation	10.3%	18.04%
Variation c.	0.202	0.388

Table 2. Selected quantiles of the percentages of correctly answered questions in both samples. Source: own elaboration.

Quantile	When measured	
	Immediately	With delay
Min	30.70	7.69
10%	38.46	23.07
25%	46.15	30.76
50%	50.94	46.15
75%	61.53	61.53
90%	61.53	69.23
Max.	76.92	84.62

As shown in Table 1, there is a difference of more than 4% between the average percentages immediately after the course and after the half-year delay. Using the Welch t-test, we can verify if we can reject the hypothesis of equality of mean values of both samples. We summarize the results of the test in Table 3. While the test against a two-sided alternative does not allow the hypothesis to

be rejected at a sufficient level of confidence, in a test against a one-sided alternative that immediately after completing the average percentage is higher than half a year apart, we can reject the hypothesis with confidence exceeding 92%.

Table 3 Results of the Welch t-test of the equality of average percentages immediately after the course and after half a year after the course. Source: Own elaboration.

Alternative	Two side		One side	
	Anon	Later	Anon	Later
Measured	50.94 %	46.84%	50.94 %	46.84%
Mean	50.94 %	46.84%	50.94 %	46.84%
t-statistics	1.435		1.435	
p-value	0.1547		0.07737	

The test result can also be confirmed by comparing both distributions. We illustrate the empirical densities and cumulative distribution functions in Figure 3. From the comparison of the densities in the left part of Figure 3, it is evident that immediately after completing the course, the percentages are more concentrated near the mode of the distribution. Thus, this distribution has higher kurtosis, negatively skewed and, in addition, the mode is significantly shifted to the right as opposed to the distribution of percentages after a half-year interval. The right part then compares the empirical distribution functions. It is evident from the figure that the distribution function graphs intersect, but the success rate immediately after graduation shows the second-order stochastic dominance.

In assessing the causes of the significant impact of the process of forgetting when financial education is interrupted. We focused on the importance that students attribute to financial literacy. This has proved to be a decisive factor in the growth of the average level of financial competence, how it was published in (Kozubikova, 2017). It was, therefore, reasonable to assume that importance would also be a factor affecting the durability of knowledge or even further improvement.

Our assumption was confirmed when dividing the research samples into groups of respondents who attribute a high level of importance to financial literacy and respondents who perceive it as of little importance. After evaluating the results in both groups, we performed tests for equality of means,

whose results are summarized in Table 4. While in the group of students who attribute a high level of importance to financial literacy, the average percentage success rate has even increased, in the second group the hypothesis of equality of mean values can be rejected at a confidence level in exceeding 99%.

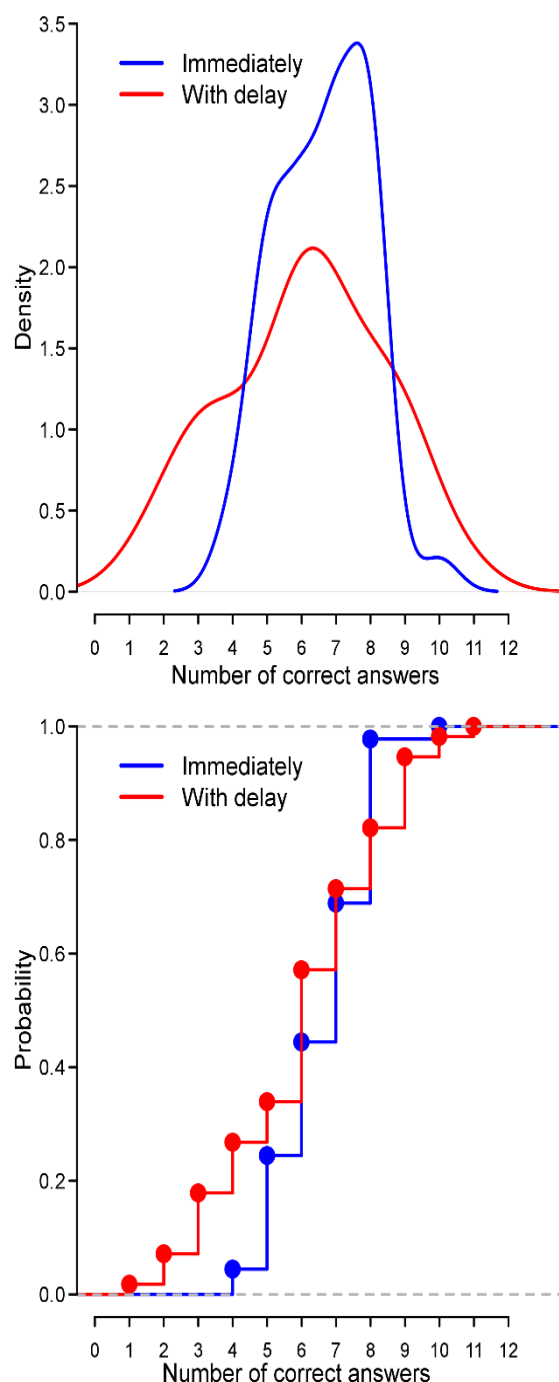


Fig. 3 The empirical densities of the percentages (upper side) and empirical cumulative distribution functions of the percentages (lower side) immediately after absolving the course and with half-year delay. (Own elaboration)

We illustrate the densities and cumulative distribution functions of the average percentage of success in the subset of respondents who consider financial literacy to be of little importance in Figure 5. The figure shows a shift in the probability distribution of percentage towards lower values. This shift is so significant that from distribution functions we see that they do not cross and the percentage success immediately after graduation dominates in terms of stochastic dominance of the first-order.

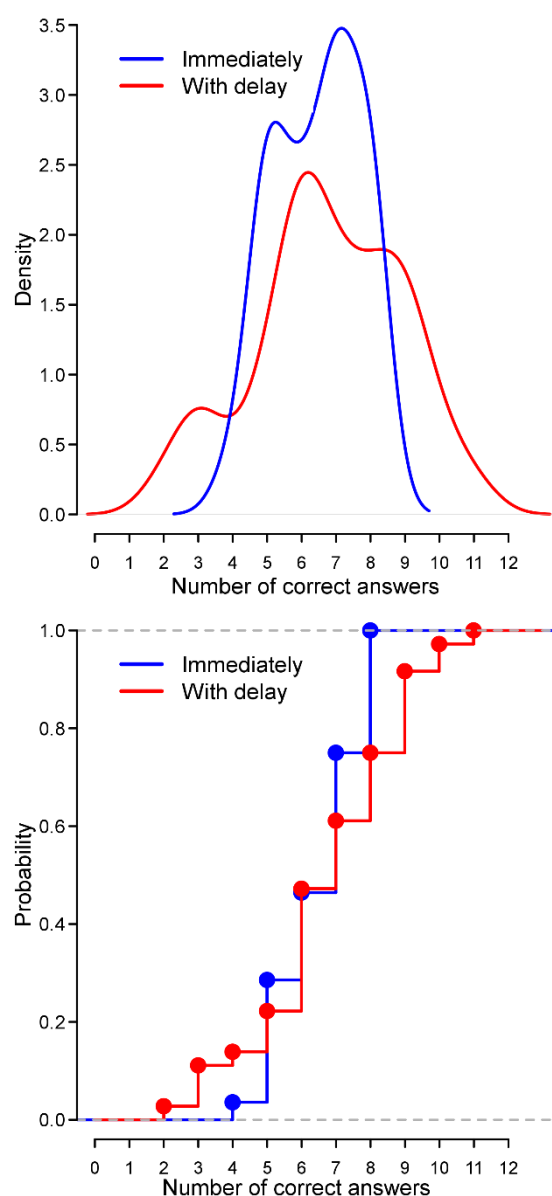


Fig. 4 The empirical densities of the percentages (left side) and empirical cumulative distribution functions of the percentages (right side) in the group of respondents that consider the financial literacy to be highly important, immediately after absolving the course and with half-year delay (Own elaboration)

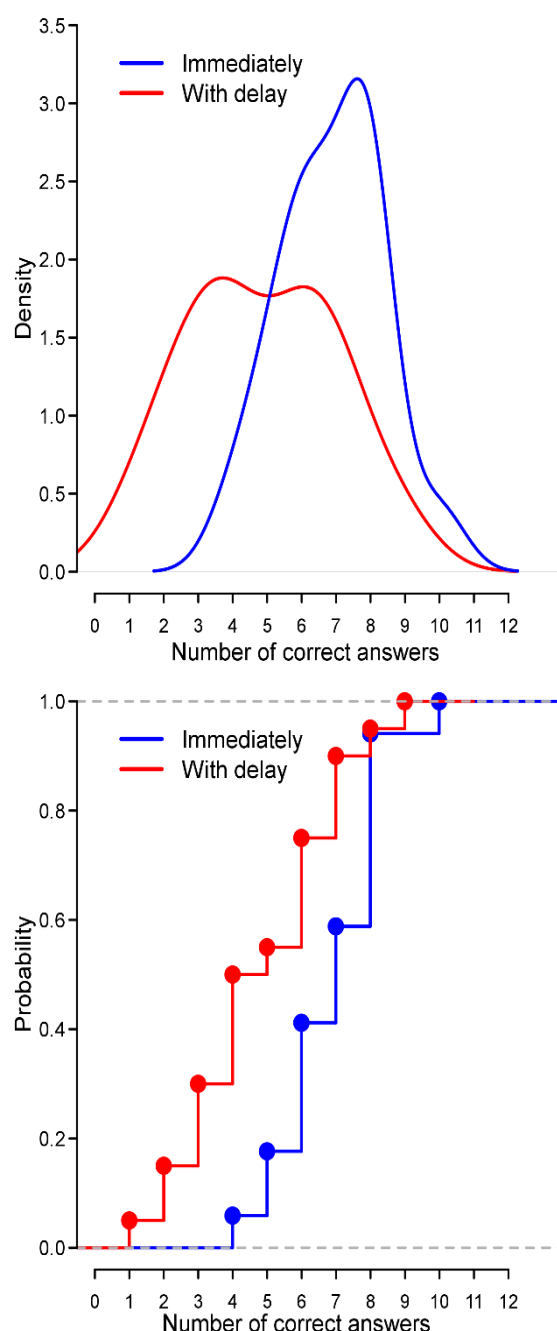


Fig. 5 The empirical densities of the percentages (upper graph) and empirical cumulative distribution functions of the percentages (lower graph) in the group of respondents that consider the financial literacy to be a little important, immediately after absolving the course and with half-year delay. (Own elaboration)

The empirical densities of the percentages (upper graph) and empirical cumulative distribution functions of the percentages (lower graph) in the group of respondents that consider the financial

literacy to be highly important, immediately after absolving the course and with half-year delay has therefore been shown that the level of perception of the importance of financial literacy is decisive for the effectiveness of financial education and the retention of acquired knowledge and competences. On the contrary, underestimation of this importance leads to a significant decrease in skills and manifestation of short-term memory only after preparation for the completion of the education cycle.

Table 4 Results of the Welch t-test of the equality of average percentages immediately after the course and after half a year after the course by groups according to the financial literacy importance perception. Source: Own elaboration.

Importance	Very important		Little important	
Measured	Anon	Later	Anon	Later
Mean	49.72 %	52.14%	52.94%	37.31%
t-statistics	-0.7298		3.3422	
p-value	0.7658		0.0010	

5 CONCLUSIONS

Our research has confirmed the suggestion that students lose their financial skills and competences quite quickly when they interrupt their education process. This is partly due to the focus on fast, short-term memory, which is also reflected in tests from other subjects. However, it was also confirmed that the perception of the importance of financial literacy is also an important factor in influencing knowledge retention. These results also provide some lessons for the learning process itself and for teachers as creators of the education system. First, it is necessary to convince students of the importance of these problems not only for their professional but also for private life. In the end, who would entrust the management of their own business to a manager who cannot consolidate and manage their own finances? The second result is that training in financial management and financial decision-making should not be interrupted. On the contrary, in all follow-up disciplines, it is desirable that students learn to evaluate the financial impact of their decisions. Without evaluating this aspect, they cannot become a fully qualified manager.

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