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The Impact of the Pandemic on the Level of Financial Literacy of Technical University Newcomers

Zuzana Kozubíková[1]
Aleš Kozubík[2]

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Abstract: *Financial literacy is one of the key competencies for life in modern 21st-century society. Several studies show that education plays an important role in raising the level of financial literacy and economic awareness. It is the consistency and continuity in education that positively influence an individual's financial competence. However, recent years have been influenced by the anti-pandemic measures in connection with the COVID-19 disease. These measures have also had a significant impact on education particularly, in the transition to distance online education. In this paper, the authors focus on the level of financial literacy of university students coming out of long-term distance education. The authors have applied the questionnaire survey method in the research. The research uses the personal finance index as a proxy for measuring financial literacy. The authors compare the results obtained with those from the pre-COVID period using statistical methods. This approach then allows concluding the impact of the move to distance learning on levels of financial literacy.*

1. INTRODUCTION

A sufficient level of financial literacy is becoming an increasingly important part of the competencies of a modern person living in the 21st century. This has been confirmed by the beginning of the new millennium. It brought dynamic development of new technologies and the associated development of new financial instruments on the one hand, but also several financial shocks on the other.

Let us note, for example, the collapse of Enron, which held more than $60 billion in assets, involved one of the biggest bankruptcy filings in the history of the United States. It has ruined many American retirees.

Another major crisis of the early millennium was the insolvency of the investment bank Lehman Brothers. This event escalated to bring the global economy to the brink of collapse. Immediately following the bankruptcy filing, an already distressed financial market began a period of extreme volatility. The fall of Lehman also had a strong effect on small private investors such as bondholders. The ensuing crisis was responsible for the failure of dozens of other banks, a sharp drop in the stock market, and a decline in real estate prices. It hit the car industry, the health sector and the energy industry. Unemployment and homelessness increased both in the US and worldwide.

In the last two years, our lives have been significantly affected by the COVID-19 pandemic. The significant impact of this pandemic can be seen in all areas of life, not just financially. The continuous adoption of new anti-pandemic measures, the repeated long-term lockdowns have

1 University of Žilina, Faculty of Management and Informatics, Dpt. of Macro and Microeconomics, Univerzitná 8215/1, 010 26 Žilina, Slovakia
2 University of Žilina, Faculty of Management and Informatics, Dpt. of Mathematical Methods and Operations Research, Univerzitná 8215/1, 010 26 Žilina, Slovakia

affected all areas of the economy. They have resulted in a fall in production, and not a few businesses have gone bankrupt. Many people have lost their jobs, especially in the service sector, and insolvency has risen significantly. The governments of the various countries have prepared many support and help programmes for both companies and the population. It is not easy to navigate these programmes and decide on the most appropriate form of assistance.

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These events underline the growing need for financial literacy. Without this competence, it is impossible to ensure financial stability throughout life. Many incorrect decisions can have devastating consequences in the long term. It should also be mentioned that many financial decisions have to be made at a young age when people do not have enough experience. This places demands on effective financial education and the promotion of financial literacy. The education sector has also been significantly affected by the pandemic. In particular, it brought long-term online distance learning. During the waves of the pandemic so far, schools have been closed for practically a year and a half, with short breaks. Distance education brings with it problems such as the availability of Internet connections, the possibilities of simultaneous connections in large families and, last but not least, the passivity and only formal participation of students in the classroom. Such experiences led us to formulate the research hypothesis:

Hypothesis one: There was a deterioration in the level of financial literacy during distance education.

Thus, this study aimed to verify the state of financial literacy of newly entering students in universities after the COVID period. In doing so, we focused on management students, who can be assumed to be more closely related to the issue mentioned above.

Our observations from previous research, published for example in (Kozubik et al., 2019), have shown unevenness in the level of knowledge in different areas of financial literacy. Thus, it is reasonable to expect that the eventual variation in achievement will not be the same across single functional areas. This leads us to formulate the hypothesis:

Hypothesis two: Changes in financial literacy levels are non-uniformly distributed across functional areas.

2. LITERATURE SURVEY

Financial literacy is generally perceived intuitively as the ability to understand finances. However, there are several more or less complex definitions of financial literacy in the literature. Kim (2001) gives a very simple definition: *Financial literacy is the basic knowledge that people need in order to survive in modern society.* Mandel (2008) provides a more sophisticated definition that incorporates a reference to finance. He defines financial literacy as *The ability to evaluate new and complex financial instruments and make informed judgments about both: choices of instruments and extent of use that would be in their own best long-run interests*. Giesler & Veresiu (2014) define financial literacy as *The ability to understand how money works in the world: how someone manages to earn or make it, how that person manages it, how he/she invests it* *(turn it into more) and how that person donates it to help others.* More specifically, it refers to the set of skills and knowledge that allows an individual to make informed and effective decisions through their understanding of finances. Lusardi & Mitchell (2014) gave a more exact definition of financial literacy as the knowledge of basic financial concepts needed to make rational financial decisions regarding saving, investing, taking out loans and insurance. To measure financial literacy among adults, the OECD/INFE developed the definition: *Financial literacy is a combination of awareness, knowledge, skill, attitude, and behaviour necessary to make sound financial decisions and ultimately achieve individual financial well-being. (Atkinson & Messy, 2012).* The PISA Financial Literacy Assessment Framework OECD (2019) refines the definition used for adults to make it relevant for 15-year-old students: *Financial literacy is knowledge and understanding of financial concepts and risks, and the skills, motivation and confidence to apply such knowledge and understanding in order to make effective decisions across a range of financial contexts, to improve the financial well-being of individuals and society, and to enable participation in economic life.*

Several international studies confirm the positive impact of financial education on the growth of financial literacy. For example, Fornero & Monticone (2011) confirmed that the most important factor influencing the differences in financial literacy is the level of attained education. Similarly, Lusardi & Mitchell (2007) state: *Worldwide financial education has become an important tool to surmount the growing complexity of financial decisions, especially in the life of the last generation*. The positive impact of financial education on the level of financial literacy was also confirmed by a study (Kozubíková Z., 2017). Moreover, it has been detected that: *An important factor influencing the progress in financial literacy during education is the importance that the respondents attribute to the financial literacy.*

Ansong (2011) pays special attention to the group of university freshmen. The average result in this survey was only 35.7%, and the maximum success rate was 75% correct answers. Similar results were obtained by (Avard et al., 2005). In their sample, first-year college students achieved an average success rate of 34.8%, and the best result was at 80%. Similarly, a study by (Chen & Volpe, 1998) also confirmed lower levels of financial literacy in lower-class rank college students. The level of financial literacy of young people in the V4 countries is the focus of the work (Szafrańska, 2019). In particular, this study showed a difference between the level of financial literacy in large cities and rural settlements.

A study (Kozubík et al., 2017) has shown that the importance of financial literacy perceived by the respondents is a significant factor influencing the level of financial literacy. Therefore, we also focused on changes in the importance students attach to financial literacy. The series of lockdowns brought several existential challenges to many families. In many cases, this involved job loss or forced enterprise closures. Addressing such difficulties has the potential to promote an awareness of the importance of financial literacy and building financial reserves to ensure well-being in the future. Therefore, we formulated a research hypothesis:

Hypothesis three: There was an increased awareness of the importance of financial literacy.

The confirmation of this hypothesis could contribute to some compensation for the shortcomings associated with impersonal distance education, which requires a dose of personal involvement and activity on the part of the learner.

3. METHODOLOGY

Our research is based on data that have been collected through a questionnaire survey. For comparison purposes, we conducted two phases of the survey. The first survey was conducted in autumn 2019, before the onset of the COVID pandemic. The second round of data collection took place in 2021, immediately after the new students started their first year. Both surveys focused on the freshmen at the Faculty of Management and Informatics of the University of Žilina. For maximum objectivity of comparison, an identical questionnaire was used in both rounds of the survey.

The knowledge testing part of the questionnaire consisted of 30 multiple-choice questions. Respondents entered the answers as a choice of four options, one of which was correct, and one option was the "I don't know" option. Besides the knowledge questions, the questionnaire contained questions concerned with socio-demographic data such as age, gender, education, the residence.

We used the personal finance index (P-Fin index) as a measure of financial literacy. Lusardi, Yakoboski, & Oggero (2017) have introduced this measure and they designed the P-Fin index to cover the eight functional areas of financial literacy that an individual commonly encounters in managing personal finances. These areas are:

Functional area 1: Earnings, determinants of wages and income.
Functional area 2: Consuming, budgeting and spending.
Functional area 3: **S**aving, comprehension the accumulation factors.
Functional area 4: Investing, understanding the types and risks of investments.
Functional area 5: Borrowing and debt management.
Functional area 6: Risk management, comprehension of the uncertain outcomes.
Functional area 7: Insurance and the understanding of coverages.
Functional area 8: Accessing and working with information sources.

For the purpose of our research, we interpret the resulting P-Fin index as the percentage success rate of responses. Similarly, we consider each functional area of financial literacy as the percentage of correct answers from that issue.

An important factor influencing financial literacy is the rating of its importance. In the questionnaire, respondents were asked to rate the importance of financial literacy on a scale of 0 to 10. We then tested the significance of the change using a statistical test.

We will evaluate the obtained data using statistical methods. Namely, we use two-sample tests of statistical hypotheses for the equality of random selection characteristics. All calculations were performed using the statistical programming environment R.

4. RESULTS

In the first round of the survey, we have distributed in total 300 questionnaires. After removing incompletely or maliciously completed questionnaires, we obtained a sample size of 245 respondents. The response rate of the questionnaires corresponds to a level of 81.67%. In the second round, we distributed 180 questionnaires. After removing incomplete answer sheets, we get a sample size of 149 respondents. The corresponding response rate was 82.78%. Due to the technical focus of the faculty's study programs, our samples are gender imbalanced. However, their structure corresponds to the gender representation among the faculty's students.

The descriptive characteristics of each sample are presented in Table 1. One can observe here a very slight shift towards higher success rates in favour of newly arrived students in the post-COVID period. The calculated characteristics show a greater concentration of results around the mean. However, mentioned shift is not very significant, what is confirmed by the Welsch ttest for equality of means. The result of this test is the content of Table 2. As we can see, one can reject the hypothesis of equality of mean percentages with an insufficient confidence level below 75%.

Table 1. Descriptive statistics of the P-Fin scores of both samples before and after the COVID period separately

	Min.	1st Quartile	Median	Mean	3rd Quartile	Max
Before COVID	0.10	0.40	0.47	0.48	0.56	0.90
Post COVID	0.20	0.40	0.50	0.49	0.57	0.80

Source: Own elaboration

Table 2. Results of the two-sample Welch's t-test for the means of P-Fin indices before and after the COVID pandemic period

	Mean	*t*-statistics	*p*-value
Before COVID	48.01%	-0.60377	0.2732
After COVID	48.81%		

Source: Own elaboration

It is interesting to look at changes in the level of financial literacy by gender. Table 3 presents a statistically significant increase for males. The corresponding p-value shows that we can reject the hypothesis of equality of means at the 95 confidence level. In contrast, we cannot reject such a hypothesis for females, as documented in Table 4.

Table 3. Results of the two-sample Welch's t-test for the means of P-Fin indices before and after COVID pandemic period performed for men

	Mean	*t*-statistics	*p*-value
Before COVID	49.40%	-1.6091	0.05474
After COVID	52.04%		

Source: Own elaboration

Table 4. Results of the two-sample Welch's t-test for the means of P-Fin indices before and after COVID pandemic period performed for women

	Mean	*t*-statistics	*p*-value
Before COVID	44.78%	0.16978	0.4327
After COVID	44.44%		

Source: Own elaboration

Table 5. Results of the two-sample Welch's t-test for the means of percentages in the functional area of earnings, determinants of wages and income

	Mean	*t*-statistics	*p*-value
Before COVID	43.46%	-1.9554	0.02572
After COVID	48.14%		

Source: Own elaboration

To obtain a more detailed look at changes in financial literacy level, we compared percentages rates in each functional area. It turns out that there was an increase in the area of earnings, determinants of wages and income, as illustrated in Table 5. In this case, we reject the hypothesis of equality of the straddles at the 97.5% confidence level.

The second area where there has been an increase in financial literacy is investing, understanding the types and risks of investments. As Table 6 shows, the hypothesis of equality of means can be rejected in this case with a confidence level exceeding 97%.

Table 6. Results of the two-sample Welch's t-test for the means of percentages in the functional area of investing, understanding the types and risks of investments

	Mean	*t*-statistics	*p*-value
Before COVID	33.65%	-1.9062	0.02873
After COVID	38.34%		

Source: Own elaboration

For the other functional areas, the resulting average success rates are roughly equal. There was a more significant decline in the knowledge of approximately two percentage points in two functional areas. The first of them is the category of saving, understanding the accumulation factors. The second area is insurance and understanding of coverages. However, these declines allow rejecting the hypotheses only at a confidence level of around 80%.

The results of the assessment of the importance of financial literacy are summarised in Table 7. It is easily visible there is a statistically significant increase in the rating of the importance of financial literacy. We can reject the null hypothesis of equality of average rating with a confidence level exceeding 99%.

Table 7. Results of the two-sample Welch's t-test for the average importance rating of financial literacy.

	Mean	*t*-statistics	*p*-value
Before COVID	8.211	-3.4331	0.0003
After COVID	8.757		

Source: Own elaboration

5. DISCUSSION

The survey results of first-year students did not confirm our expectations that there has been a decline in financial literacy under the impact of the pandemic measures and the reduction of face-to-face teaching. On the contrary, the average success rate in answering the survey questions increased slightly. However, this difference is not statistically significant. We can therefore conclude that our hypothesis one has not been confirmed.

Looking more closely at the non-descriptive statistics of the obtained sample, we see an increase in the level of the weakest outcome. The worst performance in the pre-COVID period was only10%, while it increased to 20% for students coming after the COVID waves.

A more detailed analysis we obtained looked in more detail at the individual functional areas of financial literacy. Positive changes in attainment are particularly evident in areas that relate to everyday life. It was reflected particularly in the issues linked to dealing with earnings, wages and incomes. The second set of questions where there was an increase in attainment was on questions relating to investments. Both of these areas were strongly affected by the crisis triggered by the spread of COVID-19. One can explain this result by the influence of the family environment. As a result of the significant restriction of movement, the young people were in deeper contact with their parents and thus more closely exposed to their approaches to solving financial problems. Here we should emphasise that in many cases, these were difficult decisions and situations, the existence of which they had not previously been familiar.

Compared to this result, we observed a slight decline in those areas of financial literacy that require higher doses of numeracy. Specifically, these are also exponential growth laws when analysing the accumulation factor. The second area is insurance, which in turn requires elements of probabilistic thinking. Thus, the synergistic effect of the shortfall in the education of other disciplines has manifested itself here. These findings confirmed hypothesis two about the uneven and ambiguous impact of the anti-pandemic period on different areas of financial literacy.

The survey outcomes affirmed that students have begun to feel more strongly about the importance of being financially literate after the pandemic crisis. This result is a confirmation of hypothesis three. A shift in the assessment of the importance of financial literacy represents a positive result. Based on the results published in (Kozubik et al., 2017), it is a prerequisite for greater effectiveness in financial education.

The fact that people had to overcome an extraordinary situation can be identified as the reason for the observed developments. They have thus undergone a process that was unimaginable to most of them. Coping with this emergency forced people to give up their desire for immediate welfare. Instead, they had to deal with issues of deferred prosperity. These developments affected almost the entire population, not excluding the younger age groups. Therefore, increased intrinsic motivation of students could be expected as a result of which the effectiveness of education could be enhanced.

6. FUTURE RESEARCH DIRECTIONS

Currently, we can observe the onset of the next wave of COVID-19 diseases. Although most governments declare their willingness not to interrupt teaching in schools, a further shift to distance learning cannot be ruled out. Thus, by continuing the survey, it will be possible to verify the maintenance of the observed trend. Alternatively, it may be possible to identify limits for substitution of systematic education by taking on experience in the family. Further research aims to identify other predictors of financial literacy such as numeracy, measures of cognitive reflection or measures of anxiety and self-efficacy. There is a need to compare these characteristics and analyse their changes in online distance education.

In addition to the newly rising tide of disease, we are also facing the onset of an energy crisis and massive general price rises. The impact of this economic crisis determines the next possible direction of research. It would aim to confirm a deeper awareness of the importance of financial literacy and its consequent increase.

7. CONCLUSION

The article presents the results of the research based on the personal finance index that is recently developed as an innovative measure of knowledge. Our research came to the surprising result that switching to distance education did not negatively affect the overall level of financial literacy. Overall, however, the results are erratic. While overall performance improved in areas of routine decision making, there was a deterioration in fields that require the interaction of multiple disciplines. The vital role of the family, which continues to play an essential role in education, was demonstrated. Taking on experience from those older and more experienced helped to compensate for gaps in learning. A model built based on the identified predictors makes it possible to find ways to enforce better financial literacy and which interventions, on the other hand, do not have a longer-term effect on improving the level of financial literacy and economic education.

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