THE EFFECT OF THEORETICAL KNOWLEDGE AND PRACTICE ON THE FINANCIAL LITERACY OF UNIVERSITY STUDENTS IN THREE EUROPEAN COUNTRIES

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Abstract

The present study describes the financial literacy of university students in 3 countries and its changes based on the results of a questionnaire study conducted in 2019 and 2020. It introduces the typical groups into which the students can be classified according to their financial knowledge, behavior and attitude. The formulation of the groups was performed with the help of variables created based on the responses to the questionnaire. Group formation was performed by cluster analysis. The specific groups differ from each other according to demographic characteristics, specialty of study and full/part-time training. The role of financial knowledge acquired in the education system proved to be decisive in making financial decisions in later years. This highlights the importance of teaching financial knowledge even for those students who are not specializing in economics. Practice has a key role: those university students who have jobs beside their studies perform better in the fields of financial knowledge and behavior as well. The performance is particularly enhanced by intellectual occupations. A similarly higher performance can be observed among part-time students who essentially study beside their work.

Key words: financial literacy, university student, financial education, experience, crisis

JEL Code: G53, A23, G01

Introduction

In the past years, in 2019 and 2020, in a 2-phase questionnaire research we studied financial literacy and financial sense of security among university students. The COVID-19 pandemic that started in December 2019 created the timeliness of the second survey.

Our present research was only a subfield of a larger complex research. The present study introduces one area among these. In this study, we examine whether different groups among university students can be formed based on the factors that determine financial literacy. The financial literacy of higher education students has been a topic in the literature for nearly forty

years. The breakout of the coronavirus epidemic brought such changes that give a whole new meaning, in literature and in our repeated survey, too.

1 Literature review

Researching the financial literacy of university students has decades of history and continues today (Chen & Volpe, 1998; Danes & Hira, 1987), among others with the comparison of economics and non-economics students (Béres et al., 2020; Jain & Jain, 2018). There are multiple approached to financial literacy, the present study is based on the broadly accepted definition of OECD, according to which financial literacy has 3 components (Kossev, 2020). In general, the area of knowledge includes the knowledge of basic financial concepts as well as the necessary mathematical skills. Its role has appreciated in value in recent years (De Beckker et al., 2019), particularly financial education has become an important area (Németh, 2017; Xiao & Porto, 2017). Another component of financial literacy is behavior, which includes every activity in the widest range, but nowadays primarily consumer behavior and consciousness are important (Herman, 2020; McNeal, 2007). The third area examines financial attitude. Today there are attitude research studies that encompass multiple countries and demographic groups (Bay et al., 2014; Luksander et al., 2014). The above 3 areas are supplemented by financial security, a part of which is the ability to create savings (Csath et al., 2020; Demirgüc-Kunt et al., 2018).

The consequences of the 2008 economic recession are still detectible today, and it will probably take many years to reach the pre-pandemic level. Today's students will play an important role in this rebound as they will soon enter the labor market, where they will have to prove the usefulness of their freshly gained knowledge. The present research deals with this knowledge as well as the connected behavior and attitude.

According to the traditional economic approach, individuals can be considered rational in their financial decisions. However, in some situations, their behavior is characterized by irrational behavior (Sipos, Tóth, 2006a). All this logic can be observed not only in life situations requiring a financial mindset, but also in many areas of consumer behavior (Sipos, Tóth, 2005). Thus, for example, it also prevails during consumption (Sipos, Tóth, 2006b). In many cases, this type of decision-making requires a completely different way of thinking, which may be based on previous financial knowledge, but is used differently by individuals in a decision-making situation (Szalai, Tóth, 2020). An important issue may be the analysis of employee motivations at work, which is closely related to their knowledge of the field (Juhász et al.,

2017). There is also a relationship with his personal goals, family circumstances and intentions, which in some cases cannot be classified as financially and economically rational (Czeglédi et al., 2016).

2 Methodological summary

The goal of the present study is the research of special issues by compiling a questionnaire of simple questions and processing the results. The questions evaluated the 3 components of financial literacy and the sense of financial security, as well as the socio-demographic characteristics influencing them. All questions except age were quantified using a yes-no or Likert scale. We compiled the questionnaire from our own questions developed based on literature after a pilot-test. The questionnaires were filled in by Hungarian, Slovakian and Austrian university students first in 2019. COVID-19 made the survey timely again in 2020, since numerous new issues arose in connection with the pandemic. When selecting the sampling method, we started from the premise that the population of university students can be reached in typical places in larger numbers, the most important of which is the university. Therefore, we chose a special version of the so-called time-space sampling method used for hidden populations (Parsons et al., 2008). The sampling site was the university, the sampling period was September 2019 and September 2020, respectively, during the period of education with physical presence. We distributed the questionnaire with the help of our friends who study at these universities. That is, the time-space sampling method was supplemented with respondent-driven sampling (Heckathorn, 1997). The method obviously has problems in a statistical sense. An example is the fact that we cannot visit all possible locations. However, every student is typically found at a particular university. Nor can it be guaranteed that all members of the target population will have an equal chance of being included in the sample. However, given the epidemic, we wanted to receive a larger sample of the study population before the expected second wave. Based on their responses, we created three subsamples from the respondents: economics students, law students, and other (typically art, freeart / humanities, teacher) students. The number of items in all three groups was over one hundred in both years, so given the large number of items, we assumed the normality of the sample means based on the central limit theorem (Polya, 1920). After the descriptive statistical processing of the responses, we developed our own indices. The index was constructed using an aggregation method, averaging the values of the responses to the questionnaire questions. Thus, the financial knowledge, behavior, and attitudes of all our respondents were characterized by a number. There followed

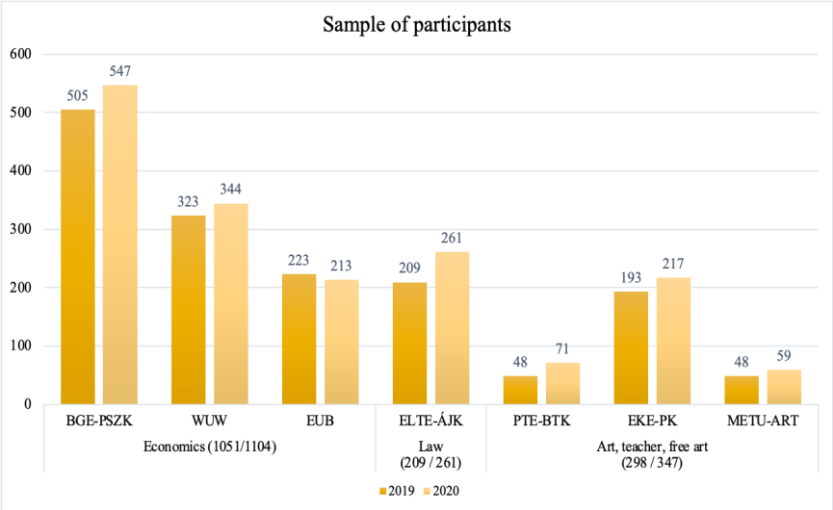
cluster analysis based on indexes created according to the responses. Our goal was to create well-defined groups that can be distinguished from each other based on their financial literacy characteristics. It was important for each respondent to be included in one (and only) one cluster, the cluster in which they share most of the characteristics common to the other members of the group. Therefore, we opted for hierarchical clustering. Within this, we chose Ward clustering (Takács et al., 2015; Tibishirani, 2009) because this procedure always brings together the groups that are most similar to each other. Scientifically speaking, this means that the procedure brings together each group in such a way that the squared Euclidean distance between the points increases the least. We finally created five clusters with this method. The present study describes some selected areas of the results of the cluster analysis.

3 Results

In view of the size limitations, the description of the results and the discussion are described at the same time. The first step in processing the received responses was describing the sample. In 2019 a total of 1,549 students filled in the questionnaire, then 1,712 students in 2020. The students of the same universities were the respondents in both years:

- Budapest Business School, Faculty of Finance and Accountancy (BGE-PSZK),
- Wirtschaftsuniversität Wien (WUW),
- Ekonomická Univerzita v Bratislave (EUB),
- Eötvös Loránd University, Faculty of Law and Political Science (ELTE-ÁJK),
- University of Pécs, Faculty of Arts (PTE-BTK),
- Eszterházy Károly University, Faculty of Education (EKE-PK),
- Budapest Metropolitan University, Faculty of Arts and Creative Industries (METU-ART).

Fig. 1 Students participating in the study



Source: Author's own elaboration

Among the respondents the percentage of women and men was 40-60%, typically full-time students (75%) were in the sample. 75% of the student only study, of the 25% who work beside their studies 20% are employed in white-collar jobs while 5% in blue-collar occupations.

As the first step our own indexes (financial knowledge, financial behavior, financial attitude) were produced by averaging the responses of the students, this was followed by linear regression modeling. Based on this it can be established that the performance of economics students is significantly better than that of their peers in other specialties. The only exception is represented by law students, their performance is identical with the performance of economics students.

Since in the conducted analyses financial knowledge, attitude and behavior produced different patterns in each demographic group and partial sample, the next step was to create well-distinguishable groups in the complete sample based on these 3 dimensions. The groups were created by the method of hierarchic cluster analysis, as described in the section Methodology. The created 5 clusters are the following (Fig. 2, Tab. 1):

Finances are important, but that is it: it is typical of the members of this cluster that their financial attitude and financial knowledge are approx. two tenth behind their financial behavior. Thus, the students in this group consider finances important, but their knowledge still needs to be polished, and their activity is also lower than what could be expected based on their opinion about finances.

Withdrawn: the students in this group have very low average from the aspect of all 3 cluster forming characteristics. They are Withdrawn as a result of the lowest knowledge, thus

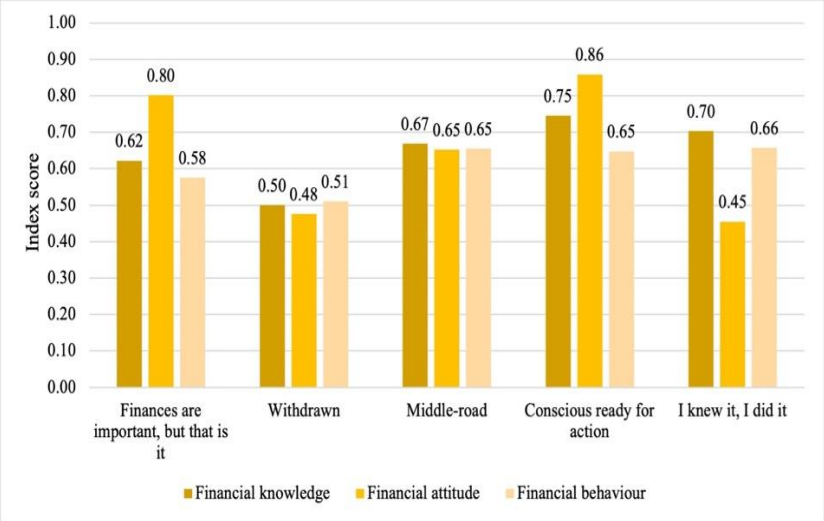
they show only the minimally necessary activity in finances and they regard the field with low importance.

Middle-road: the students in this group represent the average from the aspect of the 3 dimensions, and none of them stands out in comparison to the other 2 groups, thus all 3 represent a similar level.

Conscious ready for action: this is the group with the highest financial knowledge and attitude. Its members consider finances important; they have proper knowledge, and their financial activity is also relatively high.

I knew it, I did it: this group is very similar to the previous one from the aspect of financial knowledge and behavior, but financial attitude is the lowest of all the groups here. They are those students who are relatively well-informed regarding finances, but do not regard it with special importance, they 'just' do it.

Fig. 2 Cluster centers



Source: Author's own elaboration

Tab. 1 Statistics of the 5 clusters from the aspect of the cluster forming characteristics and stress as well as financial sense of security

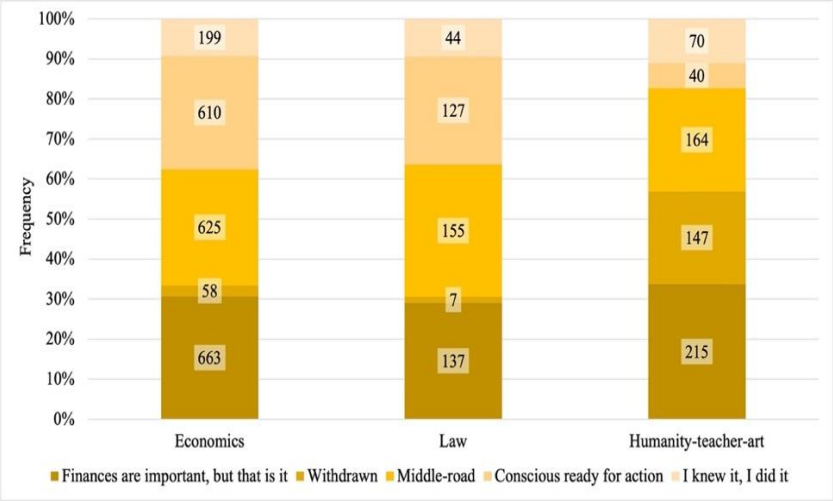
Variable	Cluster	N	Average	Divergence	Levene F, sf1, sf2, sig	ANOVA /Welch F, sf1, sf2, sig
Financial knowledge	Finances are important, but that is it (b)	1015	0.622	0.082	44.973	714.394
	Withdrawn (a)	212	0.500	0.082	4	4
	Middle-road (c)	944	0.669	0.086	3256	927.524
	Conscious ready for action (e)	777	0.745	0.050	<0.001	<0.001
	I knew it, I did it (d)	313	0.703	0.069		
	Total	**3261**	**0.665**	**0.099**		
Financial Attitude	Finances are important, but that is it (c)	1015	0.802	0.092	37.174	2513.974
	Withdrawn (a)	212	0.476	0.105	4	4
	Middle-road (b)	944	0.652	0.052	3256	891.835
	Conscious ready for action (d)	777	0.858	0.068	<0.001	<0.001
	I knew it, I did it (a)	313	0.455	0.081		
	Total	**3261**	**0.718**	**0.156**		
Financial Behavior	Finances are important, but that is it (b)	1015	0.575	0.082	14.917	279.167
	Withdrawn (a)	212	0.510	0.084	4	4
	Middle-road (c)	944	0.655	0.063	3256	925.09
	Conscious ready for action (c)	777	0.648	0.068	<0.001	<0.001
	I knew it, I did it (c)	313	0.657	0.072		
	Total	**3261**	**0.619**	**0.086**		
Financial sense of security	Finances are important, but that is it (b)	1015	2.760	0.575	2.737	29.416
	Withdrawn (a)	212	3.000	0.623	4	4
	Middle-road (b)	944	2.750	0.573	3256	925.924
	Conscious ready for action (c)	777	2.552	0.568	0.027	<0.001
	I knew it, I did it (b)	313	2.734	0.633		
	Total	**3261**	**2.721**	**0.592**		

Source: Author's own elaboration

When comparing genders significant differences can be detected ($\eta^2(4)=12.658$; $p=0.013$). This is the result of the fact that in the case of the *Withdrawn* and *I knew it, I did it* clusters the percentage of female students is higher, while in the other 3 clusters the percentage

of male students is higher in comparison with the average of the complete sample. This is consistent with recent studies showing that women have lower financial literacy than men (Artavanis & Karra, 2020; Bottazzi & Lusardi, 2020). There are also significant differences in the distribution of the clusters in the case of the 3 countries ($\eta^2(8)=43.273$; $p<0.001$). In comparison with the other 2 countries, in Hungary *Withdrawn* represent a higher percentage, while *Conscious ready for action* are lower. Austria is the exact opposite of the Hungarian sample: here the percentage of *Withdrawn* is the lowest, while the percentage of *Conscious ready for action* is the highest. Slovakia represents the middle road in comparison with the other 2 countries. When comparing the 3 study specialties (Fig. 3) significant differences can be detected again ($\eta^2(8)=43.273$; $p<0.001$). The most visible difference is between the Art-teacher-free art specialties and the students of the other 2 specialties. The higher financial literacy of economics students is a fact, but unfortunately even their literacy level is not always adequate (Rafinda & Gal, 2020). However, this may be due not only to a lack of knowledge but also to a few other psychological reasons (Belsky & Gilovich, 2000). Among the former there is an outstandingly high percentage of those in the *Withdrawn* group, but the *Conscious ready for action* group is the least represented in their sample. These two features point out why there were differences when it comes to countries: in the Austrian and Slovakian sample there are only economics students. It was an important result of the regression model that the year as well as its interaction with specialty of study and full/part-time schedule all had significant effects, which indisputably proves the role of the coronavirus-pandemic in the trend of financial literacy.

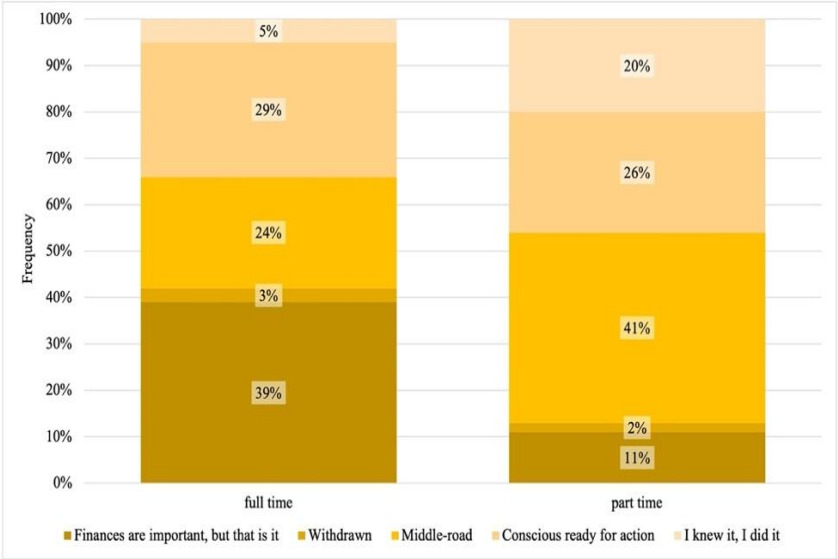
Fig. 3 Clusters and study specialties



Source: Author's own elaboration

In consideration of this distribution of respondents, the next step was a cluster analysis only including economics students. Since there is no substantive difference around the above analyzed socio-demographic variables in comparison with the complete sample, we became curious about the role of full/part-time among economics students and jobs on top of their studies. Full/part-time schedule of students showed significant ($\eta^2(4)=260.271$; $p<0.001$) differences in the distribution of the 5 clusters in the partial sample narrowed down to economics students. Aside from the percentage of *Withdrawn* and *Conscious ready for action* clusters the difference is rather spectacular. Among the part-time students the percentage of those in the *I knew it, I did it* (20% vs 5%) and *Middle-road* (41% vs 24%) clusters was much higher, but the representatives of *Finances are important, but that is it* (11% vs 39%) cluster are less than one third (Fig. 4). Our results are consistent with the findings in the literature that justify the role of practice in the higher financial literacy of part-time students (Kozubik, 2021).

Fig. 4 Distribution of the clusters of economics students according to full/part-time schedule

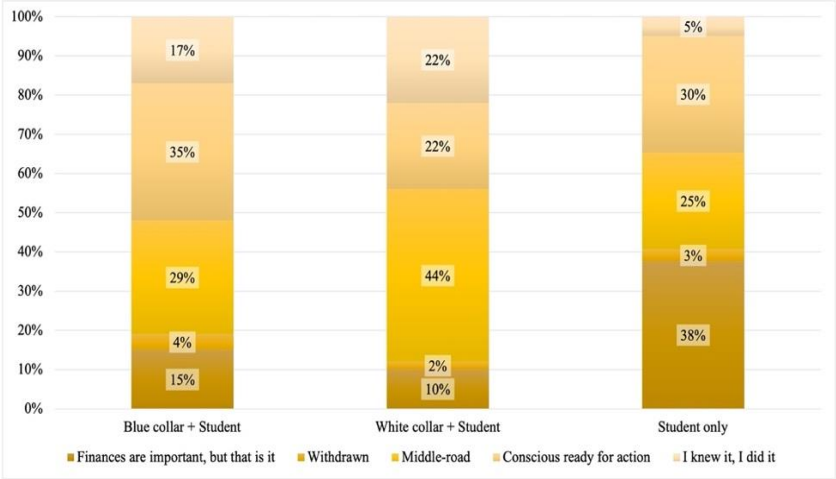


Source: Author's own elaboration

According to white/blue-collar type of employment, the economics students show a significant ($\eta^2(8)=279.735$; $p<0.001$) difference from the aspect of the 5 clusters. The *Withdrawn* cluster is represented in relatively similar percentage (2-4%) in all 3 groups, but the other 4 clusters show marked differences. The percentage of the *I knew it, I did it* (22% vs 17% and 5%) and the *Middle-road* (44% vs 29% and 25%) clusters is the highest among students performing white-collar work. The *Conscious ready for action* are in the highest percentage among students performing blue-collar work (35% vs 22% and 30%), while the *Finances are important, but*

that is it cluster appears in the highest percentage in the group of those who are only studying (38% vs 15% and 10%), as it is shown in Fig. 5. The difference between manual workers and clerical staff has also been demonstrated by PISA surveys (OECD, 2014).

Fig. 5 Distribution of the clusters of economics students based on work beside their studies



Source: Author's own elaboration

Conclusions

The implications and proposals are mentioned in the summary, given the size constraints. The connection between the 5 clusters and demographic groups is characteristic. Women are Withdrawn or have proper financial knowledge, which they also use in practice. Men are rather characterized by extreme attitude, i.e., they either consider finances very important or not at all. The third group of men is the 'true average', they are the ones who perform on the average level in everything. Arts-teacher-free arts students are typically Withdrawn, while economics and law students are in the other clusters. Classified according to full/part-time schedule, 70% of those in full-time schedule and 40% of those in part-time schedule have similar cluster classification to men. Those who do not work beside their studies are typically in the „Finances are important, but that is it" cluster, while white-collar work beside studies leads to an average result even in a pessimistic scenario. In the optimal case, the latter group is characterized by high level of knowledge and proper behavior without overvaluing the importance of finances. Therefore, one of our most important conclusions is that knowledge learned in the economics specialty increases the level of financial literacy, which suggests that it would be a good idea to extend teaching financial knowledge to students in other specialties. The features we found also suggest that it would be worthwhile to compile curriculum differentiated according to discipline, mode of study and eventual employment status. The other conclusion is that work

and life experience (Czeglédi, Juhász, 2013), i.e., practical activity builds new knowledge elements into existing knowledge.

References

Artavanis, N., & Karra, S. (2020). Financial literacy and student debt. *The European Journal of Finance*, *26*(4–5), 382–401. https://doi.org/10.1080/1351847X.2019.1711435

Bay, C., Catasús, B., & Johed, G. (2014). Situating financial literacy. *Critical Perspectives on Accounting*, *25*(1), 36–45. https://doi.org/10.1016/j.cpa.2012.11.011

Belsky, G., & Gilovich, T. (2000). *Why Smart People Make Big Money Mistakes And How To Correct Them: Lessons From The New Science Of Behavioral Economics* (Fireside Ed edition). Simon & Schuster

Béres D., Huzdik K., Deák-Zsótér B., & Németh E. (2020). *Felmérés a felsőoktatásban tanuló fiatalok pénzügyi kultúrájáról [Survey on the financial culture of young people in higher education, in Hungarian]* (p. 53) [Kutatási jelentés]. Állami Számvevőszék. https://www.asz.hu/storage/files/files/elemzesek/2021/felsooktatas_penzugyikultura_20210311.pdf?ctid=1307

Bottazzi, L., & Lusardi, A. (2020). Stereotypes in financial literacy: Evidence from PISA. *Journal of Corporate Finance*, 101831. https://doi.org/10.1016/j.jcorpfin.2020.101831

Chen, H., & Volpe, R. P. (1998). An Analysis of Personal Financial Literacy Among College Students. *Financial Services Review*, *7*(2), 107–128. https://doi.org/10.1016/s1057-0810(99)80006-7

Csath M., Lentner C., & Halmai P. (2020). Koronavirus-VS-Gazdasag. *Bonum Publicum (Közszolgálat)*, *2020*(3), 18–20.

Czeglédi, Cs., & Juhasz, T. (2013) Reconciliation Plan of Career and Private Life in the Circle of Daytime Students in Hungary. In: *ICABR 2013* pp.71-77.

Czeglédi, Cs., Juhász, T., & Tóth, A. (2016). "A családos munkavállalók megítélése" vélemények a munkavállalók részéről. In: Rudnák, Ildikó (szerk.) *Gazdaság – Multikulturalitás – Kommunikáció*. Gödöllő, Hungary: Szent István Egyetemi Kiadó. 26–35.

Danes, S. M., & Hira, T. K. (1987). Money Management Knowledge of College Students. *Journal of Student Financial Aid*, *17*(1), 4–16.

De Beckker, K., De Witte, K., & Van Campenhout, G. (2019). Identifying financially illiterate groups: An international comparison. *International Journal of Consumer Studies*, *43*(5), 490–501. https://doi.org/10.1111/ijcs.12534

Demirgüc-Kunt, A., Klapper, L., Singer, D., Ansar, S., & Hess, J. (2018). *Global Findex Database 2017: Measuring Financial Inclusion around the World* (p. 151). International Bank for Reconstruction and Development/The World Bank. https://doi.org/10.1596/978-1-4648-1259-0

Heckathorn, D. D. (1997). Respondent-Driven Sampling: A New Approach to the Study of Hidden Populations. *Social Problems*, *44*(2), 174–199. https://doi.org/10.2307/3096941

Herman, B. (2020, June 25). *Megkérdezték a magyarokat a pénzről: Íme az eredmény*. Napi.Hu. https://www.napi.hu/magyar_gazdasag/oecd-felmeres-mnb-eredmeny-penzugy-tudatossag-muveltseg-penz-bank.708750.html

Jain, N., & Jain, J. K. (2018). An Appraisal of Financial Literacy between Commerce and Non-Commerce Students (A Case Study of Dr. Harisingh Gour University, Sagar). *Commerce Today*, *12*(01), 9. https://doi.org/10.29320/jnpgct.v12i01.10984

Juhász, T., Chovan, B. & Tóth, A. (2017). A férfi karriertervezés. *Opus et Educatio: Munka és Nevelés*, *4*(3) pp. 305–315.

Kossev, K. (2020). *OECD/INFE 2020 International Survey of Adult Financial Literacy* (OECD/INFE, p. 78) [International Survey of Adult Financial Literacy]. OECD. https://www.oecd.org/financial/education/oecd-infe-2020-international-survey-of-adult-financial-literacy.pdf

Kozubik, A. (2021). FINANCIAL LITERACY OF THE MANAGEMENT STUDENTS – CZECH AND SLOVAK EXPERIENCE. *MEST Journal*, *9*(1), 75–83. https://doi.org/10.12709/mest.09.09.01.10

Luksander, A., Béres, D., Huzdik, K., & Németh, E. (2014). A felsőoktatásban tanuló fiatalok pénzügyi kultúráját befolyásoló tényezők vizsgálata [An empirical study of financial culture versus risk-taking in students in higher education, in Hungarian]. *Pénzügyi Szemle - Online*, *2014*(2), 237–258.

McNeal, J. (2007). *On Becoming a Consumer*. Routledge. https://www.routledge.com/On-Becoming-a-Consumer/McNeal/p/book/9780750683357

Németh, E. (2017). Pénzügyi kultúrát fejlesztő képzések: Felmérés és diagnózis | Pedagógiai Folyóiratok. *Új Pedagógiai Szemle*, *2017*(7–8), 46–68.

OECD. (2014). *PISA 2012 Results: Students and Money (Volume VI): Financial Literacy Skills for the 21st Century*. OECD. https://doi.org/10.1787/9789264208094-en

Parsons, J. T., Grov, C., & Kelly, B. C. (2008). Comparing the Effectiveness of Two Forms of Time-Space Sampling to Identify Club Drug-Using Young Adults. *Journal of Drug Issues*, *38*(4), 1061–1081. https://doi.org/10.1177/002204260803800407

Polya, G. (1920). Über den zentralen Grenzwertsatz der Wahrscheinlichkeitsrechnung und das Momentenproblem. *Mathematische Zeitschrift*, *8*(3–4), 171–181. https://doi.org/10.1007/BF01206525

Rafinda, A., & Gal, T. (2020). FINANCIAL LITERACY OF ECONOMICS AND NON-ECONOMICS STUDENTS. *International Review of Management and Marketing*, *10*(3), 35–38. https://doi.org/10.32479/irmm.8974

Sipos, L., & Tóth, A. (2005). A fogyasztói döntés közgazdasági megközelítése. *Marketing és Menedzsment, 39*(6), 4–12.

Sipos, L., & Tóth, A. (2006a). A közgazdasági értelemben vett irracionális döntések kognitív okai. *Marketing és Menedzsment, 40*(1), 2–31.

Sipos L., & Tóth A (2006b). Rational approach in Hungarian mineral water market. *Hungarian Electronic Journal of Sciences* 1, 1–9.

Szalai, Ibolya, & Tóth, Arnold (2020). The Different Dimensions of Intelligent Inverse Innovation. In: András, István; Rajcsányi-Molnár, Mónika (Eds.) *East-West Cohesion IV.: Strategical study volumes*, Subotica, Serbia: Čikoš Group, 143–158.

Takács S., Makrai B., & Vargha A. (2015). KLASSZIFIKÁCIÓS MÓDSZEREK MUTATÓI. *Psychologia Hungarica*, *3*(1), 67–88. https://doi.org/10.12663/PSYHUNG.3.2015.1.5

Tibishirani, R. (2009). Distances between Clustering, Hierarchical Clustering. In *Data Mining* (pp. 350–357). Carnegie Mellon University. https://www.stat.cmu.edu/~cshalizi/350/lectures/08/lecture-08.pdf

Xiao, J. J., & Porto, N. (2017). Financial education and financial satisfaction: Financial literacy, behavior, and capability as mediators. *International Journal of Bank Marketing*, *35*(5), 805–817. https://doi.org/10.1108/IJBM-01-2016-0009

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