Personal Financial Literacy among University Students studying Engineering

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Abstract

Nowadays financial literacy is essential as in a society much of the financial responsibility has shifted from governments to the individual. The findings of earlier studies show that university students are not knowledgeable about personal finance and their financial skills needs improvement. This study analyzed the survey results of 536 university students to assess the financial literacy, the impact of educational and demo-graphical characteristics to the participants' financial literacy, and the students' financial opinions and choices. Results of regression analyze showed that statistically significant impact to the financial literacy had factors: academic discipline, level of education, gender, nationality, age and the choices to have a current account, a debit card, and investment services. Students studied in the Faculty of Civil Engineering compared to others, had higher knowledge in finance, especially female students. These results of study give the direction for future research and enable to enhance financial education.

Keywords: Personal financial literacy, financial education, higher education students, engineering studies, gender differences

1. Introduction

According to the definition used by Organization for Economic Co-operation and Development (OECD), financial literacy is a combination of awareness, knowledge, skill, attitude, and behavior necessary to make sound financial decisions and ultimately achieve individual financial wellbeing (OECD, 2012).
The financial literacy definition used in an international study to assess the financial literacy of young people, PISA 2012, was following: “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." (OECD, 2014, p. 33).
To improve financial literacy there is essential to enhance personal financial education. “Financial education is the process by which financial consumers/ investors improve their understanding of financial products and concepts and, through information, instruction and/or objective advice, develop the skills and confidence to become aware of (financial) risks and opportunities, to make informed choices, to know where to go for help, and to take other effective actions to improve their financial well-being and protection “(OECD, 2006, p. 118).

To elaborate personal financial education there is need to continue research as there is a range of factors that we do not know yet or whose effect we cannot assess. There are examples where good knowledge was not able to result in reasonable behavior. For instance, in OECD International Network on Financial Education pilot study undertaken in 14 countries Estonians ranked in the second group in financial knowledge and last in behavior - exhibited significantly lower levels of behavior than all other countries, except Albania. (OECD, 2012)

Previous studies among adults (Faktum & Ariko, 2010; Kann, 2010) have shown that Estonians elementary level of financial literacy is not a problem, because it is compensated by the conservative behavior of the money matters. Problems arise when there is a need for using long term financial services and calculations. Study results from 2015 show that the financial literacy level of the Estonian population indicates an upward trend. People's perception of interest and its calculation, as well as investment awareness, have improved over the previous five years and there have been a steady increase of number of families, who account their incomes and expenses, i.e. draw up a household budget (2010 33%, 2012 39% and 2015 44% of participants). (Saar Poll, 2015)

The financial literacy test, PISA 2012, was taken in 18 countries and economies. In Estonia 1088 students took the test and achieved a mean score of 529 points, which was significantly above the OECD mean (500 points) score (OECD, 2014). The disturbing fact in results was the gap, between the groups with different languages spoken at home, as students' who spoken Estonian at home had the mean score 46 points higher, than students' whose home spoken language was another language (OECD, 2014).

Earlier studies analyzing the financial literacy of students at Estonian universities showed that the level of financial literacy of students was low and that the interest of students in long-term planning was not remarkably high. 51.0% of respondents had low financial literacy and only 3.4% planned their finances for several years. (Mändmaa, 2019a) University students studying science or mathematics-oriented subjects had more financial knowledge, especially male students. The lowest level of the financial literacy mean score (52%) was of students studying in field of Construction. (Mändmaa, 2019b)

As financial education should be meet the needs and financial literacy level of the target audience, it is important to explore more deeply what and how affects the financial knowledge, and what kind of influence have the knowledge to students' personal finance issues and decisions.

This study had two purposes: First, examine the financial literacy and its relationships with financial opinions and choices (i.e. views on personal finance issues and financial decision making) made by students' who studying engineering sciences in Estonia; Second, to explore the impact of socio demographic characteristics to the participants' financial literacy, opinions and choices.

The main goal of this study was to examine personal financial literacy, opinions and choices among university students' who studying engineering sciences to give the results what will enable to identify needs and gaps in financial education for develop the area and well-being in society.

The paper is organized as follows. Section two considers the previous relevant contributions in literature, related to financial literacy and education. Section three describes the methodology and the sample that was used. Section four presents the results that were obtained, and finally section five concludes the paper.

2. Literature review

Wealthy people are more financially literate than poor people, and those with high education attainment are also more financially literate. (Lusardi, 2017)

Financial education should be regarded as a lifetime, on-going and continuous process, to take account of the increased complexity of markets, varying needs at different life stages, and increasingly complex information. (OECD, 2006)

The findings from an OECD International Network on Financial Education pilot study undertaken in 14 countries show that compound interest and diversification is lacking amongst sizable proportion of the population in every country. (OECD, 2012)

Researchers have examined the financial literacy and practice of various components of society. Several studies throughout the world have shown that females tend to display lower level on personal financial literacy than males, among adults (Lusardi & Mitchell, 2006; Fonseca, et al., 2010; Monticone, 2010), students (Chen and Volpe, 1998; Chen and Volpe, 2002; Atkinson et al 2006; OECD, 2012; Mändmaa, 2019a, b), and adolescents (Lusardi et al 2010). Goldsmith and Goldsmith (1997; 2006) suggested that females have lower level in financial literacy than males as their general interest in investment and personal finance is usually lower, and they are less confident in their ability to perform financial analysis. Chen and Volpe (2002) argued that enthusiasm and confidence may be the contributing factors that explain why men are more financially knowledgeable than women. They stated that Personal Finance is mostly number-oriented subject and not attractive to women, as women prefer courses with less mathematics and other number-oriented science. (Chen and Volpe, 2002)

Several researchers have noted that age makes an important influence in the level of financial literacy. For instance, Atkinson et al (2006) obtained results in the study of the United Kingdom population, that 26-year-old and older are in higher financial literacy levels than the younger. Similar results were obtained in the study among university students in Estonia (Mändmaa, 2019a). Chen and Volpe (1998) surveyed college students in US and noted that participants under the age of 30 are more likely to be less knowledgeable as compared with those of the age of 40 or older.

Various studies (Chen and Volpe, 1998; Mändmaa, 2019a,b; Pires and Quelhas, 2015) examined students financial knowledge revealed that students with an economic academic discipline or which individuals attending programs in business sciences tend to reveal a higher level of financial literacy. Lewis Mandell who was surveyed the Financial Literacy of Young American Adults, released his opinion:" Regardless of major, college students learn how to do research and solve problems. In a rapidly changing financial system, these two skills are more important to financial decision-making than understanding financial products, rules, and regulations. Knowing how to approach a problem and how to research it are key to making the best personal financial decisions." (2008, pp. 29) According to the results students who study science and engineering had the highest financial literacy scores and those who studied business or economics came next (Mandell, 2008).

The research among Portuguese students revealed that the existence of prior experience, as credit clients or the existence of saving habits increases the financial literacy of individuals. (Pires and Quelhas, 2015)

Financial literacy can have important implications for financial behavior. Previous research has found

that people with low financial literacy are more likely to have problems with debt (Lusardi and Tufano, 2009), less likely to participate in the stock market (van Rooij *et al*, 2007), less likely to accumulate wealth and manage wealth effectively (Hilgert *et al*, 2003; Stango and Zinman, 2007), and less likely to plan for retirement (Lusardi and Mitchell 2006, 2009).

The financial situation of today's youth in USA is characterized increasingly by high levels of debt, as between 1997 and 2007, average undergraduate student loan debt rose from $9,250 to $19,200 — a 58% increase after accounting for inflation (Reed, 2008). Cole, Paulson and Shastry showed that education improves credit scores, and dramatically reduces the probability of declaring bankruptcy, as well as significantly increases investment income and retirement savings (Cole *et al,* 2012).

Many young people wished they had more financial knowledge. In a 2009 survey on credit card use among undergraduate students in USA, 84% of students said they needed more education on financial management topics, 60% wanted to receive this education while in high school, and 40% as college freshmen (Sallie Mae, 2009) In survey among Estonian university students, 65% of the participants were interested to get more information about financial services and monetary affairs planning (Mändmaa, 2019a).

Understanding financial literacy among young people is thus of critical importance for policymakers in several areas; it can aid those who wish to devise effective financial education programs targeted at young people as well as those writing legislations to protect younger consumers (Lusardi et al, 2010).

3. Methodology

This study used a standardized survey method to determine participants' personal financial literacy. The questionnaire was designed to cover major aspects of personal finance, included knowledge on General Personal Finance, Saving, Borrowing, Investment and Insurance. In current study were used multiple-choice questions contained 10 questions on demographic data, 23 about personal finance knowledge and five concerning participants finance choices and opinions. The validity and clarity of the survey were previously evaluated by the group of master level students and by three individuals who were knowledgeable in personal finance topics.

The responses from each participant were used to calculate the mean and median percentage of correct scores, to measure the financial literacy levels and to analyze the results. Consistent with the existing literature (Chen and Volpe, 1998; Mändmaa, 2019a, b), the mean percentage of correct scores was grouped into three categories. The first category represents a relatively high level (more than 80%) of knowledge, the second a medium (60% to 79%) and the third represent a relatively low level (below 60%) of knowledge.

Previous research advised that levels of financial literacy vary among subgroups of students (Chen and Volpe, 1998, 2002; Mändmaa, 2019a, b). To provide evidence of the differences the Analysis of Variance (ANOVA) was used. The differences were further analyzed using logistic regression models. The participants were divided into two groups using the median percentage of correct answers of the sample. Students with scores higher than the sample median were classified as students with relatively higher (More) knowledge, coded as "1" and students with scores equal or below the median are classified as

those with relatively lower (Less) knowledge, coded as "0". The dichotomous variable, financial literacy level (More, Less), was used in logistic regression as the dependent variable, which was explained simultaneously by all the independent variables. To detect if the independent variables have different effect on students' financial literacy the logistic regression analysis conducted separately two times: for entire sample and for students studying Civil Engineering.

In current case the independent variables were age, academic discipline, level of education, gender, household size, nationality, work experience, currently available financial services (including the use of credit card), planning period for personal finance affairs, and interest about personal finance topics.

In this study, the logistic model took on the following functional form:

$$\begin{aligned}\log\left[p/(1-p)\right] = {} & B_0 + B_1(Age1) + B_2(Age2) + B_3(Age3) + B_4(Academic\ discipline) + B_5(Credit\ Card) \\ & + B_6\,(Gender) + B_7\,(Household1) + B_8\,(Household2) + B_9\,(Household3) + B_{10}\,(Household4) \\ & + B_{11}\,(Household5) + B_{12}\,(Interest) + B_{13}\,(Financial\ services\ 1) + B_{14}\,(Financial\ services\ 2) \\ & + B_{15}\,(Financial\ services\ 6) + B_{16}\,(Financial\ services\ 9) + B_{17}\,(Financial\ services\ 10) \\ & + B_{18}\,(Financial\ services\ 11) + B_{19}\,(Income1) + B_{20}\,(Income2) + B_{21}\,(Income3) \\ & + B_{22}\,(Income4) + B_{23}\,(Level\ of\ education1) + B_{24}\,(Level\ of\ education2) \\ & + B_{25}\,(Level\ of\ education3) + B_{26}\,(Nationality) + B_{27}\,(Planning) + B_{28}\,(Work1) + B_{29}\,(Work2) \\ & + B_{30}\,(Work3) + B_{31}\,(Work4) + e_i \end{aligned} \quad (1)$$

Where, p = the probability of a participant with relatively more knowledge about personal finance;

B= the coefficient. Coefficients B_1 to B_{31} represent the effect of each subgroup compared with the reference group.

To understand better and find the needs and gaps in financial education, the students' choices (financial planning and services using), opinions and self-assessment, were analyzed in addition. To describe the relationships between students' choices, financial literacy and socio-demographic background, the Cross-tabulations, Chi-square tests, descriptive statistics and analysis of variances (ANOVA) were used.

Based on earlier research results, the students from the Faculty of Civil Engineering mainly were chosen as subjects of this study. For the interests of results representativeness to all students, who studied in the Faculty of Civil Engineering in the academic year 2014/2015 was offered the opportunity to participate in the survey. To increase the number of participants, the poll was conducted at paper form during the lectures. As some lectures bring together students from several faculties, more answers were gathered, and these were used to make comparisons. The total sample size was 536 and 447 of them were students studying civil engineering. Among respondents studying civil engineering, the distribution of male and female students was similar with whole Faculty of Civil Engineering, with 60% and 64% males, and 40% and 36% females, respectively. The comparison by gender and levels of education is shown in Table 1. The description of sample is presented in Table 2.

Table 1 The distribution of students by educational levels and gender

Level of education	A. Faculty of Civil Engineering				B. Sample of students studying engineering			
	Total Count	%	Male Count	%	Female Count	%	Total Count	%	Male Count	%	Female Count	%
Bachelor studies	156	12,0	79	50,6	77	49,4	93	20,8	41	44,1	52	55,9
Master studies	288	22,2	150	52,1	138	47,9	93	20,8	58	62,4	35	37,6
Integrated Bachelor's and Master's Study	855	65,8	606	70,9	249	29,1	261	58,4	170	65,1	91	34,9
Total	1299	100,0	835	64,3	464	35,7	447	100,0	269	60,2	178	39,8

Source: Author's own preparation based on Statistics of the TTU Faculty of Civil Engineering (2015)

Notes: The data presented in the table part B are appropriate for generalization (Chi-square=12,910 significant at level 0,002).

Table 2 Characteristics of the sample

Characteristics	Faculty of Civil Engineering		Male participants		Female participants		Entire sample	
	Frequency	%	Frequency	%	Frequency	%	Frequency	%
Total amount of observations	447	100	326	100	210	100	536	100
A. Education								
1. Academic discipline								
a) Civil Engineering	447	100	269	82.5	178	84.7	447	82.5
b) Other	0	0	57	17.5	32	15.3	89	17.5
2. Level of education								
a) Bachelor studies	93	20.8	96	29.5	81	38.3	177	33.0
b) Master studies	93	20.8	59	18.1	36	17.2	95	17.8
c) Integrated Bachelor's and Master's Study	258	57.7	168	51.5	92	44.0	260	48.5
d) Unanswered	3	0.7	3	0.9	1	0.5	4	0.7
B. Experience								
1. Age groups								
a) 18-22	259	57.9	198	60.7	142	67,6	340	63.4
b) 23-29	150	33.6	102	31.3	55	26,2	157	29.3
c) 30 and up	38	8.5	26	8.0	13	6,2	39	7.3
2. The work experience								
a) None	126	28.2	104	31.9	67	31.9	171	31.9
b) Less than 2 years	172	38.5	126	38.7	81	38.6	207	38.6
c) 2 to 5 years	78	17.4	43	13.2	40	19.0	83	15.5
d) More than 5 years	64	14.3	50	15.3	16	7.6	66	12.3
e) Unanswered	7	1.6	3	0.9	6	2.9	9	1.7
C. Demographic characteristics								
1. Nationality								
a) Non-Estonian	75	16.8	48	14.7	43	20.5	91	17.0
b) Estonian	372	83.2	278	85.3	167	79.5	445	83.0
2. Gender								
a) Male	269	60.2	326	100	0	0	326	60.8
b) Female	178	39.8	0	0	210	100	210	39.2
3. Household size								
a) Live alone	129	28.9	102	31.2	54	25.7	156	29.1
b) Live with husband/ wife	92	20.6	45	13.8	55	26.2	100	18.7
c) Live with husband/ wife and children	37	8.3	27	8.3	13	6.2	40	7.5
d) Live with parents/grandparents	146	32.7	126	38.7	64	30.5	190	35.4
e) Other	43	9.6	26	8.0	24	11.4	50	9.3
D. Income								
1. Personal monthly net income								
a) Do not want to answer	64	14.3	61	18.7	36	17.1	97	18.1
b) Under 300 EURO	176	39.4	129	39.6	90	42.9	219	40.9
c) 301- 750 EURO	113	25.3	70	21.5	52	24.8	122	22.8
d) 751 EURO and over	94	21.0	66	20.2	32	15.2	98	18.2
E. Background								
1. Educational level of parents - existence of higher education								
a) Mother	278	62.2	207	63.5	120	57.1	327	61.0
b) Father	207	46.3	166	50.9	88	41.9	254	47.4
c) Stepparent	21	4.7	12	3.7	11	5.2	23	4.3
d) Grandparent	92	20.6	69	21.2	44	21.0	113	21.1
2. Number of books in childhood home								
a) Under 100	103	23.0	76	23.3	54	25.7	130	24.3
b) 101 – 500	243	54.4	176	54.0	112	53.3	288	53.7
c) More than 500	92	20.6	68	20.9	39	18.6	107	20.0
d) Unanswered	9	2.0	6	1.8	5	2.4	11	2,0

Notes: Author's own preparation based partly on Mändmaa, 2020.

4. Results and Analysis

To evaluate the level of financial literacy and analyze the factors that influencing students studying the engineering in higher education institution the survey was conducted. The questionnaire was filled in by 536 students. Most participants were Estonians (83%). In terms of gender, male participants accounted for about 61% and females 39%, of the sample. About 82% of the participants were from Faculty of Civil Engineering and 93% of participated students were under 30 years old. The collected data were analyzed by using the software Statistical Package for the Social Sciences (SPSS).

4.1 Differences in personal financial literacy

The survey responses are summarized, and differences of answers by gender and by level of financial literacy are presented in Table 3. Lower financial literacy scores mainly concerned topics of insurance and interest formation. In total, survey results showed that participants' financial literacy was at Medium level.

Compared the results of all respondents and respondents from the faculty of Civil Engineering, the results of the Civil Engineering faculty were significantly better. There was only one question of the 23 (question about the impact of inflation), where the responses average score was 1.3% lower. On average, female students answered to the 69.1% of questions correctly, while score of students studying civil engineering was 72.5% and male students had the correct answers for the 66.5% and 70.8% of questions, respectively.

Table 3 Mean percentages of correct responses by gender and result of ANOVA

Brief description of the questions	Level of Personal Financial Literacy									Total %
	Low Below 60%			Medium 60-79%			High Over 80%			
	M	F	F test	M	F	F test	M	F	F test	
I General Personal finance knowledge										
1. Personal financial literacy				73.9 78.1	70.0 76.4	0.983 0.169				72.4 77.4
2. Asset liquidity	41.1 43.9	48.6 51.7	2.895 2.633							44.0 47.0
3. Meaning of inflation				71.8 76.2	77.1 79.2	1.904 0.551				73.9 77.4
4. Impact of inflation							79.4 85.1	83.3 82.0	1.250 0.763	81.0 83.9
5. Understanding of loan interest							95.7 96.7	96.2 97.7	0.076 0.456	95.9 97.1
6. Cost of apartment leasing				68.1 74.0	69.0 73.0	0.053 0.049				68.5 73.6
7. Legal requirement for apartment lease				66.9 68.4	70.0 73.6	0.574 1.387				68.1 70.5
8. Time value of money	59.5 61.7	50.9 53.9	3.811* 2.675							56.2 58.6
9. Discount valuation							97.8 98.9	96.7 97.2	0.705 1.747	97.4 98.2
Mean correct responses for the I section				72.7 75.9	73.5 76.1	0.332 0.021				73.0 76.0
II Saving, borrowing, insurance and investments										
10. Appropriate saving place				76.1	76.7	0,025	81.4	82.0	0.026	76.3 81.7
11. Annual percentage rate							89.3 91.8	90.5 92.7	0.203 0.113	89.7 92.2
12. Compound interest				65.3 71.0	66.7 73.6	0.100 0.356				65.9 72.0
13. Purchasing power assessment							83.1 88.5	88.6 92.1	3.016 1.583	85.3 89.9
14. Monthly payments of mortgage				68.1 76.6	70.5 78.1	0.337 0.138				69.0 77.2
15. Interest of loan	53.4	56.7	0.557	60.0	65.2	1.283				54.7 62.0
16. Loan co-sing consequences				59.5 64.7	66.2 68.5	2.425 0.710				62.1 66.2
17. The interest rate evaluation							89.0 93.7	91.0 92.1	0.551 0.395	89.7 93.1
18. Understanding the content of insurance	35.6 40.1	38.6 41.6	0.489 0.090							36.7 40.7
19. Homeowners' insurance	33.1 36.8	43.3 45.5	5.737* 3.383							37.1 40.3
20. Revenue of different Interest calculation	46.9 52.8	49.5 54.5	0.343 0.125							47.9 53.5
21. Risk diversification				78.5	80.9	0.459	83.6	86.0	0.437	79.5 84.6
22. High risk-return							81.9 87.0	84.8 88.8	0.739 0.312	83.0 87.7
23. Interest rates changes and treasury bond price	15.3 17.1	22.9 23.0	4.860* 2.408							18.3 19.5
Mean correct responses for the II section				62.5 67.5	66.2 70.3	5.243* 3.493				63.9 68.6
Mean correct responses for the entire survey				66.5 70.8	69.1 72.5	3.683* 2.070				67.5 71.5
Median correct responses for the entire survey										69.6 73.9

Notes: "M" - the average scores of male participants; "F" - the average scores of female participants; F test - value of F-Statistic; * significant at the 0.05 level.
The first row of each position represents the results of the entire sample and the second row shows the results of students from department of Civil Engineering.
Author's own preparation based partly on Mändmaa, 2020.

4.2 Analysis of Results by Subgroups of the Sample

The results in previous section displayed the differences in financial literacy about students' academic disciplines and gender, but the effects of other determining factors were not controlled. In this section the ANOVA was used to detect if factors from various subgroups had differences in effecting the levels of financial knowledge.

Table 4 Mean percentage of correct responses by characteristics of sample and results of ANOVA

	Characteristic	Total count	Total %	Civil engineering count	Civil engineering %
A.	**Education**				
	1. Academic discipline				
	a) Civil engineering	447	71.48	447	71.48
	b) Other***	89	47.53	-	-
	F Statistic		(281.893)**		
	2. Level of education				
	a) Bachelor studies	177	65.22	93	81.67
	b) Master studies	95	74.32	93	74.43
	c) Integrated Bachelor's and Master's Study	260	66.82	258	66.88
	d) Unanswered	4	47.83	3	59.42
	F Statistic		(10,066)**		(43.171)**
B.	**Experience**				
	1. Age groups				
	a) 18-22	340	66.73	259	72.97
	b) 23-29	157	67.79	150	68.40
	c) 30 and up	39	73.13	38	73.45
	F Statistic		(3.183)*		(6.783)**
	2. The work experience				
	a) None	171	65.27	126	71.84
	b) Less than 2 years	207	66.24	172	70.42
	c) 2 to 5 years	83	70.56	78	72.02
	d) More than 5 years	66	72.33	64	73.03
	e) Unanswered	9	66.67	7	70.81
	F Statistic		(3.693)**		(0.596)
C.	**Demographic characteristics**				
	1. Nationality				
	a) Estonian	445	68.26	372	72.28
	b) Non-Estonian	91	63.78	75	67.54
	F Statistic		(6.659)*		(8,805)**
	2. Gender				
	a) Male	326	66.50	269	70.78
	b) Female	210	69.07	178	72.54
	F Statistic		(3.683)		(2.070)
	3. Household size				
	a) Live alone	156	67.28	129	71.35
	b) Live with husband/ wife	100	69.74	92	71.41
	c) Live with husband/ wife and children	40	70.00	37	71.44
	d) Live with parents/grandparents	190	64.99	146	70.55
	e) Other	50	71.30	43	75.23
	F Statistic		(2.953)*		(1.132)
D.	**Income**				
	1. Personal monthly net income				
	a) Do not want to answer	97	62.03	64	69.90
	b) Under 300 EURO	219	66.86	176	71.61
	c) 301- 750 EURO	122	69.10	113	70.76
	d) 750 EURO and over	98	72.36	94	73.17
	F Statistic		(8.465)**		(1.008)
E.	**Background**				
	1. Level of education of the parents. Higher education exists				
	a) Mother (F Statistic)	327	68.31 (2,399)	278	71.91 (0,838)
	b) Father (F Statistic)	254	67,20 (0,191)	207	71.90 (0,410)
	c) Stepparent (F Statistic)	23	71.27 (1,478)	21	72.67 (0,192)
	d) Grandparent (F Statistic)	113	67.22 (0,051)	92	71.17 (0.068)
	2. Number of books in childhood home				
	a) Under 100	130	67.93	103	72.81
	b) 101 – 500	288	66.82	243	70.62
	c) More than 500	107	69.32	92	72.87
	d) Unanswered	11	65.84	9	65.22
	F Statistic		(1.002)		(1.850)

Notes: *significant at the 0.05 level; **significant at the 0.01 level or greater; *** Participants who were not study in field of Civil Engineering were grouped together under the name "Other".

4.3 Analysis of Results by participants' choices and opinions

Analysis of variance was used to detect if participants with different financial choices have different levels of knowledge. More detailed overview about participants' choices, made about currently available financial services is presented in Table 5.

Table 5 Results of ANOVA and mean percentage of financial literacy (FL) level in cases of differing financial choices

Students' financial choices	Civil Engineering department		Male		Female		Total	
	Count	FL level	Count	FL level	Count	FL level	Count	FL level
Currently available financial services								
Current Account								
a) Yes	392	72.9	272	69.4	180	70.4	452	69.8
b) No	55	61.4	54	52.0	30	61.1	84	55.3
F Statistic	(42.817)**		(68.789)**		(10.680)**		(73.395)**	
Debit Card								
a) Yes	368	73.9	262	69.3	163	70.7	425	69.8
b) No	79	64.6	64	55.1	47	63.4	111	58.6
F Statistic	(29.737)**		(49.933)**		(9.552)**		(52.907)**	
Term deposit								
a) Yes	62	70.3	43	67.7	29	68.1	72	67.9
b) No	385	71.7	283	66.3	181	69.2	464	67.4
F Statistic	(0,581)		(0.322)		(0.157)		(0.049)	
Saving Account								
a) Yes	100	72.9	76	67.8	43	70.5	119	68.8
b) No	347	71.1	250	66.1	167	68.7	417	67.1
F Statistic	(1.631)		(0.758)		(0.498)		(1.111)	
Student loan								
a) Yes	54	72.5	37	69.0	26	69.1	63	69.0
b) No	393	71.3	289	66.1	184	69.1	473	67.3
F Statistic	(0.567)		(1.076)		(0.000)		(0.705)	
Housing loan								
a) Yes	31	73.2	21	73.7	11	70.0	32	72.4
b) No	416	71.3	305	66.0	199	69.0	504	67.2
F Statistic	(0.615)		(4.948)*		(0.043)		(3.585)	
Other bank loan								
a) Yes	9	76.8	9	73.4	2	60.9	11	71.1
b) No	438	71.4	317	66.3	208	69.1	525	67.4
F Statistic	(1.612)		(1,869)		(0.632)		(0.646)	
Vehicle Lease								
a) Yes	25	75.3	18	73.2	10	71.3	28	72.5
b) No	422	71.2	308	66.1	200	69.0	508	67.2
F Statistic	(2.395)		(3.603)		(0.244)		(3.234)	
Insurance								
a) Yes	143	74.1	101	71.7	57	71.3	158	71.6
b) No	304	70.2	225	64.1	153	68.2	378	65.8
F Statistic	(9.240)**		(17.565)**		(1.856)		(16.578)**	
Investment Services								
a) Yes	40	77.6	23	74.1	18	79.7	41	76.6
b) No	407	70.9	303	65.9	192	68.1	495	66.7
F Statistic	(10.390)**		(6.092)*		(10.887)**		(16.273)**	
Pension fund shares								
a) Yes	138	74.6	92	72.5	62	71.3	154	72.0
b) No	309	70.1	234	64.1	148	68.1	382	65.7
F Statistic	(12.332)**		(20.828)**		(2.087)		(20.072)**	
Credit Card								
a) Yes	99	72.8	69	72.4	42	71.4	111	70.1
b) No	301	71.8	215	66.4	147	69.2	362	67.5
c) Yes, but not my own	38	69.0	34	66.0	13	64.9	47	65.7
d) Unanswered	9	57.5	8	46.2	8	61.4	16	53.8
F Statistic	(4.655)**		(5.677)**		(1.459)		(5.856)**	

Notes: *significant at the 0.05 level; **significant at the 0.01 level or greater.

Students' were asked their own opinion, does their financial literacy needs improvement, and the results showed that the higher level of financial literacy tend to relate to higher interest. By the ANOVA, the results were statistically significant, and about of full sample the generalizations could be made.

Table 6 Differences in financial literacy levels in case of differing opinions about improvement the financial knowledge

Students' opinions	Civil Engineering department		Male		Female		Total	
	Count	FL level	Count	FL level	Count	FL level	Count	FL level
Does your financial literacy level need improvement?								
a)Yes	374	71.9	274	67.3	166	70.2	440	68.4
b) No	33	70.6	21	64.0	22	64.8	43	64.4
c) Unanswered	40	67.8	31	60.9	22	64.6	53	62.4
F Statistic		(1.985)		(2.763)		(2,486)		(4.724)**

Notes: **significant at the 0.01 level or greater.
FL - Financial Literacy

4.4 Students' financial planning habits

The ANOVA tests were used to find out if there were any differences in students' financial affair planning habits. The results showed that most preferable planning period was one months, as 39% of students in whole sample (41% of males and 36% of females) and 40% in Civil Engineering department sample (43% of males and 35% of females) picked this answer to the question: "How long in advance do you plan your financial affairs (the expected revenues, the necessary costs and predictable financial situation)?". Statistically significant tests results (for whole sample F=4,098 sig=0,000 and for Civil Engineering department sample F=3,452 sig=0,000) reveled that only 5% of students planned their financial affair on several years basis and less than 1% until retirement (was only male students' choice). The number of students', who do not saw the need to plan, was an average 6%. In terms of short-term planning, the higher financial literacy level generally related to a longer planning period, and lower financial literacy level was linked to noticeably shorter or missing planning habit.

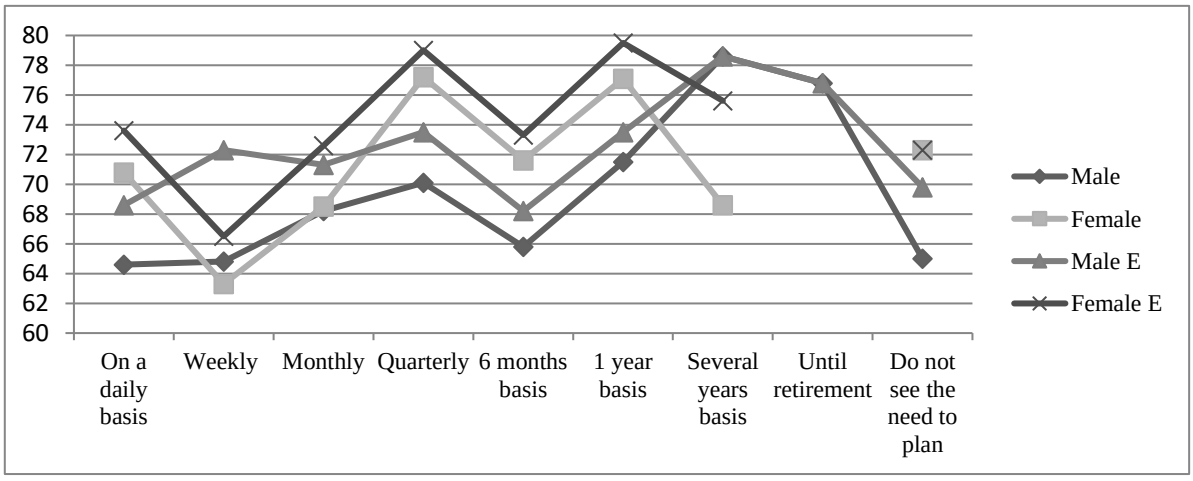

Figure 1 Students' financial affairs planning habits described through the financial literacy level and gender

Notes: Financial affairs planning habits of male and female students from Civil Engineering department are denoted Male E and Female E.

4.5 Relationships between self-assessment, confidence, and financial literacy

Students' assessment of their financial knowledge was not in line with the results of the financial literacy assessment conducted in the framework of the study. The overlap was only 38% for the whole sample (Table 7a) and 42% for the Civil Engineering department sample (Table 7b).

These results could be concluded that students' own knowledge's were overrated, as in full sample the 42% of students evaluated their knowledge to High level, but only 20 percent of those in the survey exceeded the High-level border, and the differences were similar (20%) in the Civil Engineering students' sample. By analyzing the Low-level results, the cap between self-assessment and results was small (5%) in sample of Civil Engineering department but in Full sample the difference was much bigger (18%).

225 students (97 female students i.e. 46% of females and 128 male students, i.e. 39% of males) who assessed their financial knowledge to the high level could be counted of self-confident, as well as these 55 students (17 female students and 38 male students) whose financial literacy level was low but they proposed the level as medium.

Table 7a Full sample, differences in assessments

Self-assessment about financial knowledge?		Financial literacy level			Total
		Low	Medium	High	
High	Count	41	125	59	225
	% within	18.2%	55.6%	26.2%	100.0%
	% within column	29.5%	42.8%	56.2 %	42.0%
Medium	Count	55	121	35	211
	% within	26.1%	57.3%	16.6%	100.0%
	% within column	39.6%	41.4%	33.3%	39.4%
Low	Count	23	20	2	45
	% within	51.1%	44.4%	4.4%	100.0%
	% within column	16.5%	6.9%	1.9%	8.4%
Hard to say	Count	20	26	9	55
	% within	36.4%	47.3%	16.3%	100.0%
	% within column	14.4%	8.9%	8.6%	10.2%
Total	Count	139	292	105	536
	% of Total	25.9%	54.5%	19.6%	100.0%
Note:		Chi-Square=12.847 significant at the 0.046 level			

Note: Based on Mändmaa, 2020.

Table 7b Civil Engineering department, differences in assessments

Self-assessment about financial knowledge?		Financial literacy level			Total
		Low	Medium	High	
High	Count	11	124	59	194
	% within	5.7%	63.9%	30.4%	100.0%
	% within column	20.8%	42.9%	56.2%	43.4%
Medium	Count	26	121	35	182
	% within	14.3%	66.5%	19.2%	100.0%
	% within column	49.1%	41.9%	33.3%	40.7%
Low	Count	9	18	2	29
	% within	31.0%	62.1%	6.9%	100.0%
	% within column	17.0%	6.2%	1.9%	6.5%
Hard to say	Count	7	26	9	42
	% within	16.7%	61.9%	21.4%	100.0%
	% within column	13.2%	9.0%	8.6%	9.4%
Total	Count	53	289	105	447
	% of Total	11.9%	64.7%	23.5%	100.0%
Note:		Chi-Square=26.011 significant at the 0.000 level			

4.6. Determining factors of personal financial literacy

In this section the statistically significant differences were analyzed further. The relationship between personal financial literacy and the participants' gender, education, age, nationality, income and some financial choices and opinion were examined.

The tested correlation among the independent variables was low, i.e. under 0.60 that indicate the multi-collinearity was not a problem in current analysis.

The Forward Stepwise method was chosen, and the regression analyses were run separately for two different samples. The statistically significant results of logistic regressions are reported in Tables 8a and 8b. As suggested by the Chi-square values, the models have high explanatory power. In addition, the overall fit of the models was assessed by its ability correctly classify observations. For the entire sample, 77.6% of the observations were correctly classified as compared with 56.7% change classification and for the Civil Engineering sample were correctly classified 75.2% of the observations compared with change classification 67.8%.

Based on the logistic regression analysis the results of Full sample (Table 8a) showed that students in Civil Engineering department (Acad. discipline 1) belong 50 times more likely to the group of more knowledgeable about financial literacy, than students from the others academical disciplines. The students in the Master studies (Level of education 2), were 7 times more likely to be with relatively higher knowledge about personal finance than those from Bachelor or Integrated studies.

The coefficient (B) of Gender (1), denote Male students and was negative. Consistent with findings of ANOVA, the result suggested those males were more likely to be less knowledgeable about personal finance than females. Using a small calculation (1/Exp(B)N=1/0.402=2.487) the result could be presented on the contrary, that is to say from female students perspective and to state that they were 2.5 times more likely to be more knowledgeable about personal finance than males did.

The coefficient (B) of Income (4), was also negative. That variable presented the situation when participant refused to answer the question about monthly net income. Based on the logistic regression results those participants were more likely to be less knowledgeable about personal finance than others who answered the question. The results were consistent with ANOVA results (Table 4). This concrete variable (Income 4) was more like behavioral factor as it did not give any answer about the influence of the amount of income.

ANOVA results (Table 5) of current study showed that financial services that had statistically significant effect were: Current Account, Debit Card, Housing loan (only in sample of Male students), Insurance, Investment Services, Pension fund shares and Credit Card. Based on the logistic regression results the financial services that had significant impact on participants financial literacy were Current Account (Financial services 1), Debit Card (Financial services 2) and Investment services (Financial services 10).

Table 8a Full sample. The logistic regression Model

	Step 1		Step 2		Step 3		Step 4		Step 5		Step 6		Step 7	
	B	ExpB	B	ExpB	B	ExpB	B	ExpB	B	ExpB	B	ExpB	B	ExpB
Acad. Discipline (1)	3.577**	35.771	3.553**	34.920	3.537**	34.350	3.980**	53.528	3.892**	49.020	3.874**	48.154	3.910**	49.909
Level of Education (2)			1.893**	6.637	1.949**	7.024	1.960**	7.099	2.011**	7.473	1.962**	7.114	1.933**	6.912
Financial services (1)					1.399**	4.052	1.352**	3.864	1.279**	3.595	1.177**	3.244	1.119**	3.061
Gender (1)							-0.876**	0.416	-0.942**	0.390	-0.902**	0.406	-0.911**	0,402
Financial services (10)									3.053**	21.188	3.003**	20.141	2.962**	19.345
Financial services (2)											0.551*	1.734	0.573*	1.774
Income (4)													-0.577*	0.562
Constant	-2.833**	0.059	-3.059**	0.047	-4.267**	0.014	-3.349**	0.035	-3.229**	0.040	-3.612**	0.027	-3.494**	0.030
-2 log Likelihood	569.583		536.039		516.239		499.907		478.191		474.229		470.299	
Chi-Square	163.770**		197.314**		217.113**		233.446**		255.162**		259.124**		263.054**	
Adjusted R^2	0.353		0.413		0.447		0.474		0.508		0.514		0.520	
Correct Classified	72.9		72.9		76.1		76.1		76.3		77.1		77.6	
Chance Classification 56.7														

Notes: *significant at the 0.05 level; **significant at the 0.01 level or greater.

Table 8b Sample of Civil Engineering department. The logistic regression Model

	Step 1		Step 2		Step 3		Step 4		Step 5	
	B	Exp(B)	B	Exp(B)	B	Exp(B)	B	Exp(B)	B	Exp(B)
Level of Education (3)	-1.852**	0.157	-1.816**	0163	-1.902**	0.149	-1.956**	0.141	-1.922**	0.146
Financial services (1)			1.336**	3.803	1.326 **	3.764	1.275**	3.579	1.231**	3.424
Nationality (1)					-0.867**	0.420	-0.879**	0.415	-0.832**	0.435
Age (2)							-0.691**	0.501	-0.667**	0.513
Financial services (2)									0.571*	1.769
Constant	1.976**	7.217	0.802*	2.230	1.026**	2.790	1.351**	3.862	0.887*	2.428
-2 log Likelihood	496.639		478.845		470.292		461.908		458.013	
Chi-Square	65.220**		83.014**		91.567**		99.952**		103.846**	
Adjusted R^2	0.190		0.237		0.259		0.280		0.290	
Correct Classified	67.8		71.8		74.5		72.0		75.2	
Chance Classification 67.8										

Notes: *significant at the 0.05 level; **significant at the 0.01 level or greater.

The findings of logistic regression analysis about the sample of Civil Engineering department (Table 8b) were statistically significant and compatible with results of ANOVA (Table 4). The result showed that the coefficient (B) of variables Level of Education (3), Age (2) and Nationality (1), was negative. In current case the Level of Education (3), indicated that students at Integrated Studies were more likely to be less

knowledgeable about personal finance than students studding in Bachelor and Master Studies. Variable, Nationality (1), was indicating that non-Estonians were more likely to be less knowledgeable about personal finance than Estonians. The result could be presented from Estonians perspective and to state that is (1/Exp(B)N=1/0.435=2.298) 2.3 times more likely Estonian students belong to group with higher level of financial literacy than non-Estonians. The variable, Age (2), was suggesting that participants in age 23-29 were more likely to be in a lower level of financial literacy group than students from other age groups. Based on the logistic regression results the financial services that influencing participants financial literacy were Current Account and Debit Card (ANOVA results in Table 5).

5. Discussion and conclusion

The main goal of this study was to examine personal financial literacy, opinions and choices among university students' who studying engineering sciences to give the results what will enable to identify needs and gaps in financial education for develop the area and well-being in society.

Students' financial literacy was assessed by the answers of survey questionnaire. The study analyzed the results that were gathered from 536 university students in Tallinn University of Technology. The cross-tabulation, Chi-square, ANOVA test and Logistic Regression were used to analyze the responses.

Current study revealed that there are differences between male and female students' financial literacy, and students who studied Civil Engineering were more knowledgeable in personal finance than students in other academic disciplines.

The survey results showed that low level scores concerned topics of asset liquidity, insurance, and interest formation.

Regression analysis results suggested that students' financial literacy was mainly related to four groups of variables: Education (Academic discipline and Level of education); Demographic characteristics (Gender and Nationality); Experience (Age) and Financial Services (Current Account, Debit card and Investment Services).

The study results exhibited that Estonian students' financial literacy level was raised from a low (58.9%) (Mändmaa, 2019a, b) to a medium (67.5%) level. These results are in line with the results published by the research agency Saar Poll, that people's knowledge have improved over the previous five years and the financial literacy level of the Estonian population indicates an upward trend. (Saar Poll, 2015) A study on the same period among Portuguese students also shows a positive direction, i.e. a good level of financial literacy of students (Pires and Quelhas 2015). Contrary to these, the results of earlier studies among Turkish and US students demonstrated low levels of financial literacy (Chen and Volpe, 1998; Altintas, 2011).

Statistically significant results revealed that on average females' knowledge scores (69.1%) about personal finance were higher than males (66.5%). Previous study (Mändmaa, 2019b) among Estonian university students showed that men have a higher level of financial literacy than women. Atkinson et al. (2006), Goldsmith and Goldsmith (1997; 2006), Chen and Volpe (1998; 2002), Lusardi et al. (2010) and Monticone (2010) presented the same results. The result of the Australian students' financial literacy survey showed that gender does not affect the level of financial literacy (Wagland and Taylor, 2009), while Turkish students displayed similar results to current survey, i.e. female students had higher level (Altintas, 2011).

In current study statistically significant results of ANOVA (Table 4) showed, that older students had higher level of financial knowledge. The regression analysis (Table 8b) gave the outcome that age was influencing the students' financial literacy only in the sample of Civil Engineering department (financial literacy scores among age groups: 18-22 73.0%; 23-29 68.4%; 30 and up 73.4%). A remarkable change occurred in the level of financial literacy of the younger age group, which was significantly risen compared to the results of the previous survey (18-22 55.9%), presumably due to develops in personal financial education. Several researchers have noted earlier that the older students have higher financial literacy levels (Chen and Volpe, 1998; Atkinson et al., 2006; Mändmaa, 2019a). However, Wagland and Taylor (2009) in researching Australian students' financial literacy came to the result that age would not affect the level of financial literacy, which could be a sign of appropriate financial education.

Analyzing the effect of nationality to financial literacy, it turned out that Estonians had a higher level of financial literacy compared to non-Estonians (Table 4). The same results were obtained in financial literacy studies by Faktum and Ariko (2010), Mändmaa (2019a,b), and in PISA 2012 test (OECD, 2014). Based on the results of a survey conducted among Estonian students in 2012, it can be assumed that the reasons are lack of financial education (teaching materials) in the mother tongue. In 2012 survey, 65% of non-Estonians answered that they did not understand the demands/explanations given to them by financial institutions, and 84% of them thought that it would be helpful if the service providers spoke in clients mother tongue. (Mändmaa and Zhiguleva, 2013)

Participants' educational background had a significant impact on their financial knowledge. The results for the entire survey clearly showed that students from Civil Engineering department were more knowledgeable than students from other academic disciplines. On average, the engineering students answered correctly 71% of the survey questions while on other disciplines the score was 47% (Table 4). Mandell (2008) revealed by studying the US students that the level of financial literacy of students in scientific fields of study is high. Previous study (Mändmaa, 2019b) conducted among Estonian university students concluded that in science and mathematics-based areas the level of financial literacy was high. The highest scores got the students whose study field was Economy (females 67% and males 70%) and the Info technology came next (females 65% and males 70%). Mändmaa (2019b) reported in the same study that students studying Civil Engineering (in previous named Construction) had lowest level of financial literacy (mean score 52%; females 39% and males 56%). Current study showed the opposite results (mean score 71.5%; females 72.5% and males 70.8%). The differences could be explained first, by differences in samples, as in earlier study the educational level of respondents from the study field of Construction was lower (44% in Applied studies and 56% in Integrated i.e. previously named Combined studies). There were missing participants from Bachelor and Master Studies whose overall financial literacy scores were (overall scores: Bachelor 57.7%; Master 64.3%; Applied 57.7%; Integrated 53.7%) higher in previous study and in current study (Civil Engineering students mean scores: Bachelor 81.7%; Master 74.4%; Integrated 66.9%) as well. Secondly, the financial literacy levels could be affected positively by actively started financial education.

The results confirmed that students who used financial services had a higher level of financial literacy (Table 5). Based on earlier studies (Pires and Quelhas, 2015; Mändmaa, 2019b) available financial services have an impact on students' financial literacy level. The research among Portuguese students revealed that

the existence of prior experience, as credit clients or the existence of saving habits increases the financial literacy of individuals (Pires and Quelhas, 2015) Earlier study conducted among Estonian university students exhibited that financial services with statistically significant effect were: Debit Card, Bank loan, Investment Services and Insurance (Mändmaa, 2019b). Current study results showed that financial services with statistically significant effect were even more: Current Account, Debit Card, Housing loan, Insurance, Investment Services, Pension Fund Shares and Credit Card. Students studded in Civil Engineering department were significantly more active users of financial services than participants from other study fields (Table 4, financial literacy scores: Civil Engineering 71% and Other 47%).

Contrary to the results of various other studies that bring out the problems with debts (van Rooij et al. 2007; Reed, 2008; Lusardi and Tufano (2009), the borrowing is not very popular among Estonian students, as only 21% of participants have Credit Card, 12% Student loan, 6% Housing loan and 2% Other bank loan, and the loan users average financial literacy level is not low (respectively: 70%; 69%; 72% and 71%). The amount of loan users among students studying Civil Engineering was similar (Credit Card 22%, Student loan 12%, Housing loan 7% and Other bank loan 2%).

Earlier studies expressed concerns in people's behavior, whether they accumulate and manage wealth effectively (Hilgert et al. 2003; Stango and Zinman, 2007) or whether they plan funding for retirement (Lusardi and Mitchell, 2006, 2009). Previous survey among Estonian students (Mändmaa, 2019b) showed that 7% of students hold the Investment Services, 25 % had Insurance services, and 56% of students have been thought about Retirement Funding. The finding of current study displayed positive movement (Table 5), as 8% of students own Investment Services, 29% Insurance services, 22% of participants owns Savings Account, and 29% owns Pension Fund Shares and the students studied the Civil Engineering showed even more activity as the 9% of students own Investment Services, 32% Insurance services, 31% owns Pension Fund Shares and 22% of participants own Savings Account.

Analyzing students' financial planning habits, the figures showed that in terms of short term planning the higher financial literacy level generally related to a longer planning period and lower financial literacy level links to very short or missing planning habit (Figure 1). The most preferable planning period for students was one months, as 39% of whole sample (41% of males and 36% of females) and 40% of participants from sample of Civil Engineering department (43% of males and 35% of females), picked that answer. Study revealed that only 5% of students planned their financial affair on several years' basis and less than 1% until retirement (was only male students' choice). The number of students', who do not saw the need to plan, was an average 6%. In previous study of university students, the statistically significant factor influencing the financial literacy level was financial affairs advance planning daily while the most popular planning period was one months and that without differences in responses of male or female students (Mändmaa, 2019b).

There are several researchers (Goldsmith and Goldsmith, 1997; Chen and Volpe, 2002) suggested that financial literacy tends to be affected by interest about financial topics. At previous study in Estonia 65% of the participants were interested. More curiosity had students with lower financial literacy level (below the median 57.14% level), Estonians, participants from youngest (18-21) age group and students studied in the field of Construction and Energetics. (Mändmaa, 2019b) In current survey the students were asked about their opinion, does their financial literacy needs improvement, i.e. do they have an interest to get additional

information about financial topics. The level of interest of male students was just 5% higher, based on fact that 79% of female students and 84% of male students reported that they have interest to improve their financial literacy. However, the results showed that the higher interest was related to higher financial literacy, and students studying Civil Engineering were interested most about personal financial topics (Table 6).

This study do not confirmed the results of previous studies (Goldsmith and Goldsmith, 1997; Chen and Volpe, 2002) that women have lower confidence in and less interest to personal finance than men do, as the results showed only small differences between females and males in self-assessment and interest. Findings about self-assessments from previous study among university students in Estonia showed that 8% of students rated their own financial knowledge to High level (in reality by responses 9%) and 32% of students assessed the knowledge to Low level (by responses 51%) (Mändmaa, 2019b). At previous research in Estonia have made the conclusion that if the self-assessment about financial knowledge is not high that means it is quite adequate (Faktum & Ariko, 2010). In current study 43% of students studying engineering and 42% of all participated students rated their financial knowledge as High while by study results the number of students whose responses exceeded the high-level border was accordingly 24% and 20%. Students who admitted their knowledge in the Low level, their amount among of students studying engineering was 7% and among all of participants 8%, while based on scores of correct answers the Low level had 12% and 26% of students, respectively. It could be concluded whereas the students' self-assessment was not quite adequate, and the knowledge was overrated as well as that Estonian students' self-confidence was risen noticeably in past years. The situation brings out concerns as too high self-confidence could lead to painful mistakes and points attention to the needs continue the surveys to improve curriculum with additional care. It is important to not let be influenced by the facts that students' financial literacy level has increased lately. There are still lots of open questions and risks.

Limits: The number of students from other faculties enrolled in this study was small, and students from the other universities were missing, which meant that comparisons were limited. For example, is the financial literacy of female students generally improving, or is it only in math-based academic disciplines? As questionnaire was anonymous, there was not possibility to contact whit respondents later and ask their needs in knowledge about Personal Finance, especially among students with lower scores.

These study results make the author to advice the educators in primary, secondary, and high schools: To pay serious attention to mathematics teaching. It would be good to add simpler mathematics courses that develop logic to university curricula as well. Mathematics based on logic certainly improves personal ability to create so-called bigger picture and make sound financial decisions – enhances financial literacy.

For conclusion, there is good to point out the importance of personal financial knowledge by repeating the words of Professor Lusardi: "Financial literacy gives individuals the ability to make informed financial choices. Just as it was not possible to contribute to and thrive in an industrialized society without basic literacy - the ability to read and write - so it is not possible to successfully navigate today's world without being financially literate." (Lusardi, 2017, p. 1).

6. Acknowledgement

The author would like to thank colleagues and students from Tallinn University of Technology for their valuable help in data gathering.

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