Analyzing the Factors Influencing University Students' Financial Literacy

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Abstract

Financial literacy is necessary skill for life that could be improved through financial education. To enhance financial education, it is important to examine more deeply how students' financial knowledge and personal background affects their views on personal finance issues and financial decision making. This study analyzing the questionnaire survey results of 522 university students to assess the relationships between the financial literacy and students' financial opinions and choices; and the impact of educational and demographical characteristics to the participants' financial literacy, opinions and choices. Results of regression analyze show that statistically significant impact on the financial literacy have factors as gender, nationality, academic discipline, and financial choices and opinion, as holding a debit card, a bank loan, plan the financial affairs in advance on a daily basis and an interest to get more information about financial services and monetary affairs. Students studying in the science or mathematics oriented subjects have more knowledge in finance, especially male students. These results of study enable to develop financial education and give the direction for future research.

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

1. Introduction

Nowadays financial knowledge is essential as in a society much of the financial responsibility has shifted from governments to the individual. 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).

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).

In an international study to assess the financial literacy of young people, PISA 2012 , the financial literacy definition was used the 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).

There is a range of factors that we do not know yet or whose effect we cannot assess. Good knowledge cannot always 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)

"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, pp. 118)

The financial literacy test, PISA 2012, was taken in 18 countries and economies, including Estonia. 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. The students' who have Estonian language spoken at home, had the mean score 46 points higher, than the students' whose home spoken language was another language (OECD, 2014).

Previous studies among adults (Estonian Institute of Economic Research, 2010; 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 in financial literacy arise when there is a need for using long term financial services and calculations. Faktum & Ariko identified the main risk group or target audience for the improvement of financial literacy as the average urban consumer: younger or middle age group; wage earner; an average income of middle class and regularity; level of education above the average of the sample (Faktum & Ariko, 2010). Earlier study to analyze financial literacy of university students has shown that students' financial literacy level in Estonia was low and students' interest for long-term planning was not very high. The low level of financial literacy had 51% of the respondents, only 3, 4% had plan their financial affairs on a several year basis and 55, 9% had consider retirement funding. The survey revealed that lower financial literacy level had females, as well as non-Estonians, younger than 26 years old and students studding in non-economic discipline. (Mändmaa and Zhiguleva, 2013; Mändmaa, 2019)

The low level in students' financial knowledge could be explained by lack of financial education. To improve the financial literacy level, it is required to integrate topics in economics and personal finance to all academic disciplines, especially to non-economics academic disciplines and to the non-Estonian

curriculums. As financial education should be meet the needs and the financial literacy level of their target audience, it is necessary to examine more deeply how students' financial knowledge affects their views on personal finance issues and financial decision making. (Mändmaa, 2019).

This study had two purposes: First, it examines the relationships between the financial literacy and university students' financial opinions and choices (i.e. views on personal finance issues and financial decision making). Second, it explores the impact of socio demographic characteristics to the participants' financial literacy, opinions and choices. The analysis may help identify factors that determine the level of competency possessed by students.

The main goal of this study was more deeply examine personal financial opinions and choices of university students in Estonia to give the results what will enable to identify needs and gaps in financial education provision to develop the field.

The paper is organized as follows. At section 2, the previous most relevant contributions in literature related to financial literacy and education are considered. Section 3 is focused on the methodology. Section 4 reports the results that were obtained, and finally section 5 concludes the paper.

2. Literature review

Worldwide, only 33 percent of the population is financially literate. Wealthy people are more financially literate than poor people, and those with high education attainment are also more financially literate. Furthermore, women have lower financial literacy than men and financial literacy is lower amongst young people. (Lusardi, 2017)

Financial education should be regarded as a lifetime, on-going and continuous process, in particular in order to take account of the increased complexity of markets, varying needs at different life stages, and increasingly complex information. (OECD, 2006, pp. 119)

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)

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 and Zhiguleva, 2013; Mändmaa, 2019), and adolescents (Lusardi et al 2010). Goldsmith and Goldsmith (1997; 2006) suggest 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. Following same line of reasoning, Chen and Volpe (2002) found that

women generally have not only less knowledge about personal finance, but also have less enthusiasm for, lower confidence in, and less willingness to learn about personal finance topics than men do. Personal Finance is mostly number-oriented subject and not very attractive to women, as women prefer courses with less mathematics and other number-oriented science. Chen and Volpe (2002) argue that enthusiasm and confidence may be the contributing factors that explain why men are more financially knowledgeable than women. Fonseca et al (2012) pointed out that women tend to live longer than men, have shorter work tenures, lower earnings and levels of pension or survivors' benefits, what put them at higher risk of having financial problems. Understanding how and why men and women have different levels of financial literacy allow develop policies aimed at reducing the gender gap and improving the saving and investing decisions of women.

As been shown before the 26 year old and older students are in higher financial literacy levels than the younger students (Mändmaa, 2019). Atkinson et al (2006) obtained a similar result in the study of financial literacy of the United Kingdom population. 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. Wagland and Taylor (2009) came to the result that age would not affect the level of financial literacy of Australian students.

Earlier study revealed that students with an economic academic discipline have better financial literacy than students who do not learn in the economic direction (Mändmaa, 2019). The same result was obtained by Chen and Volpe (1998). Altintas (2011) surveyed the level of financial literacy of Turkish students and exposed that academic discipline does not affect the level of financial literacy. The study that was conducted among Portuguese students gave the results according to which individuals attending programs in business sciences tend to reveal a higher level of financial literacy (Pires and Quelhas, 2015).

Lewis Mandell (2008) who was surveyed the Financial Literacy of Young American Adults, has reported that students who have taken a full semester course in money management or personal finance in high school appear to do worse than average in every subject while those who have taken a course in economics, finance or accounting in college seem to do better in every subject. (Mandell, 2008, pp. 37)

But in the same report Mandell revealed 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 have the highest financial literacy scores and those who study business or economics come next. (Mandell, 2008)

Low levels of financial literacy can be explained by the lack of motivation to learn or to retain new insights. Thus, as the emergence of new financial products and the rapid development of financial markets

continuous, it is necessary that individuals are predisposed to educate themselves towards to achieve better results. (Mandell & Klein, 2007)

Previous research has found that financial literacy can have important implications for financial behavior. 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, 2007, 2009).

The financial situation of today's youth is characterized increasingly by high levels of debt. In USA 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). There are other potentially costly consequences of accumulating high levels of debt early on, such as bankruptcy (Roberts and Jones 2001).

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 is an important component of sound financial decision-making, and many young people wish 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% would have liked to receive information about financial management topics in high school, and 40% would have liked to receive such information as college freshmen (Sallie Mae, 2009). In survey that was organized in Estonia among the university students, to the question "Do you want to get more information about financial services and monetary affairs planning?" 65% of the participants answered "yes". Students with low financial literacy were most interested, as 55% of "yes" answers came from them. (Mändmaa, 2019) 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 legislation to protect younger consumers (Lusardi et al, 2010).

3. Methodology

This study uses results that were gathered during a survey conducted among students in higher education institutions in Estonia earlier. The questionnaire covered major aspects of personal finance and contained financial knowledge about economic base-terminology, saving, borrowing, investment and insurance. The survey participants were asked to answer multiple-choice questions, including ten questions about demographic data, 14 questions to assess financial literacy and eight questions regarding students' financial opinions and choices. The validity and clarity of the survey was previously evaluated by three master level students and by three individuals who are knowledgeable in personal finance topics.

In this study the responses from participants were used to calculate the mean and median of correct scores for measure the financial literacy levels and to analyze the results. Consistent with the existing literature

(Chen and Volpe, 1998), 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 advises that levels of financial literacy vary among subgroups of students (Chen and Volpe, 1998). To provide evidences of the differences this study used analysis of variance (ANOVA). 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". This dichotomous variable, financial literacy level (More, Less), was used in logistic regression as the dependent variable, which was explained simultaneously by all of the independent variables.

The independent variables in this case (described below the Table 6) were variables such as gender, academic discipline, age, nationality, currently available financial services, planning period of financial affairs and interest about personal finance topics.

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

$$\begin{aligned} log[p/(1-p)] = {} & B_0 + B_1\,(Nationality) + B_2(Age1) + B_3(Age2) + B_4(Age3) + B_5(Academic\ discipline) \\ & + B_6(Level\ of\ Education1) + B_7(Level\ of\ Education2) + B_8(Level\ of\ Education3) \\ & + B_9(Level\ of\ Education4) + B_{10}\,(Gender) + B_{11}\,(Interest\,) + B_{12}\,(Investment) + B_{13}\,(Insurance) \\ & + B_{14}\,(Bank\ loan) + B_{15}\,(Debit\ Card)\ + B_{16}\,(Income1) \\ & + B_{17}(Income2) + B_{18}\,(Income3) + B_{19}\,(Income4) + B_{20}\,(Income5) + \ B_{21}(Planning-daily) \\ & + B_{22}(Planning-quarterly) + e_i \end{aligned} \quad (1)$$

Where, p = the probability of a participant with relatively more knowledge about personal finance;
B= the coefficient. Coefficients B1 to B22 represent the effect of each subgroup compared with the reference group, which were arbitrarily selected.

Several researches throughout the world report that females have lower level in financial literacy than males. To understand, and find some evidence if financial education should be taught to male and female students differently, students' choices (financial planning, information sorces and services using), opinions and self-assessment, were analyzed in addition.

The relationships between students' choices, financial literacy and socio-demographic background, were described using the Cross-tabulations, Chi-square tests, descriptive statistics and analysis of variances (ANOVA). Same methods were used to analyze students' self-assessment.

Earlier study (Mandell, 2008) revealed that students who study science and engineering have the highest financial literacy scores, as they learn how to do research and solve problems. To find out whether this

study confirms the above statement, the connections whit students' financial literacy level and field of study were further investigated and compared using the Cross-tabulation, Chi-square test and analysis of variances.

4. Results and Analysis

The survey was conducted among students studying in higher education institutions in Estonia to evaluate their level of financial literacy and analyse the influencing factors. The questionnaire was filled in by 522 students from 13 educational institutions, including 12 public and one private school. The collected data were analyzed by using the software Statistical Package for the Social Sciences (SPSS).

4.1 Overall Results of the Survey

Table 1 Characteristics of the Sample

Characteristics	Male participants		Female participants		Entire sample	
	Frequency	%	Frequency	%	Frequency	%
Total amount of observations	204	39.1	318	60.9	522	100
A. Education						
1. Academic discipline						
a) Non-economical	175	85.8	271	85.2	446	85.4
b) Economic	29	14.2	47	14.8	76	14.6
2. Level of education						
a) Applied higher educational studies	39	19.1	107	33.6	146	28.0
b) Bachelor studies	106	52.0	114	35.8	220	42.1
c) Combined studies	9	4.4	26	8.2	35	6.7
d) Master studies	49	24.0	67	21.1	116	22.2
e) Doctoral studies	1	0.5	4	1.3	5	1.0
B. Experience						
1. Age groups						
a) 18-21	102	50.0	148	46.5	250	47.9
b) 22-25	67	32.8	110	34.6	177	33.9
c) 26 and up	35	17.2	60	18.9	95	18.2
2. The work experience						
a) 0 years	84	41.2	97	30.5	181	34.7
b) 1 to 2 years	60	29.4	105	33.0	165	31.6
c) 3 years and up	60	29.4	116	36.5	176	33.7
C. Demographic characteristics						
1. Nationality						
a) Estonian	161	78.9	257	80.8	418	80.1
b) Non-Estonian	43	21.1	61	19.2	104	19.9
2. Household size						
a) Live alone	61	29.9	72	22.6	133	25.5
b) Live with husband/ wife	37	18.1	99	31.1	136	26.0
c) Live with husband/ wife and children	11	5.4	34	10.7	45	8.6
d) Live with parents/grandparents	89	43.6	92	28.9	181	34.7
e) Other	6	2.9	21	6.6	27	5.2
D. Income						
1. Personal monthly net income						
a) Do not want to answer	22	10.8	35	11.0	57	10.9
b) Under 300 EURO	91	44.6	148	46.5	239	45.8
c) 301- 600 EURO	50	24.5	85	26.7	25,9	25.9
d) 601 – 1000 EURO	19	9.3	37	11.6	56	10.7
e) 1001 EURO and over	22	10.8	13	4.1	35	6.7
E. Background						
1. Level of education of the parents						
a) Higher education exists	131	64.2	183	57.5	314	60.2
b) Higher education missing	73	35.8	135	42.5	208	39.8

Table 1 presents detailed characteristics of the sample. In terms of gender, male participants accounted for 39% of the sample, female participants 61%. Based on education, about 85% of the participants acquired "Non-economical" educations, the largest proportion (42%) of the participants were in Bachelor studies, 28% in Applied higher educational, 22% in Master, 7% in Combined, which in current case was 5 years study in the field of engineering and 1% in Doctoral studies. About 82% of the participated university students were from 18 to 25 years of age. The majority of participants were Estonians (80%) and by the work experience the sample was almost evenly distributed to three groups. 44% of male students stated that they live with parents or grandparents, which was their most preferred choice and exceeded the female students' same choice by 14%. Nearly half of participants had monthly income under 300 Euro. 60% of the participants had parents with higher education.

Table 2 summarizes the survey and shows differences in financial literacy by sample characteristics.

Table 2. Characteristics by Level of Financial Literacy in percentages except where noted

Characteristics	Observations		Students' financial literacy level			Chi-Square	P-values
	Number	%	Low	Medium	High		
Total amount of observations	522	100	266	209	47	148.379**	0.000
Gender						24.878**	0.000
Female	318	61	60	34	6		
Male	204	39	38	49	13		
Age groups						10.910*	0.028
18-21	250	48	54	40	6		
22-25	177	34	52	36	12		
26 and up	95	18	40	49	11		
Nationality						10.697**	0.005
Estonian	418	80	48	42	10		
Non-Estonian	104	20	64	32	4		
Academic discipline						28.465**	0.000
Economic	76	15	26	53	21		
Non-economical	446	85	55	38	7		
Level of education						19.606*	0.012
Applied higher educational studies	146	28	54	37	9		
Bachelor studies	220	42	51	43	6		
Combined studies	35	7	66	28	6		
Master studies	116	22	45	40	15		
Doctoral studies	5	1	0	100	0		
Household size						5.681	0.683
Live alone	133	25	51	39	10		
Live with husband/wife	136	26	52	37	11		
Live with husband/wife and children	45	9	47	46	7		
Live with parents/grandparents	181	35	49	44	7		
Other	27	5	63	26	11		
The work experience						4.105	0.392
0 years	181	35	48	43	9		
1 to 2 years	165	31	57	36	7		
3 years and up	176	34	48	41	11		
Personal monthly net income						12.516	0.130
Do not want to answer	57	11	60	37	3		
Under 300 EURO	239	46	51	41	8		
301- 600 EURO	25,9	26	54	36	10		
601 – 1000 EURO	56	11	46	43	11		
1001 EURO and over	35	6	31	49	20		
Level of education of the parents	57					2.282	0.319
Higher education exists		60	49	43	8		
Higher education missing		40	54	36	10		

Notes: *significant at the 0.05 level; **significant at the 0.01 level or greater.
Source: Author's own preparation based on Mändmaa, 2019.

204 male and 318 female students participated in the poll. Looking at the distribution of students between the different financial literacy levels it is notable that the biggest number of male students (49% or 100) was in medium level but the biggest number of female students (60% or 189) was in low level. 57 percent of the students holding a higher level, were men. Using the cross-tabulation and Chi-Square test the results show that the differences in financial literacy by gender were statistically significant (p=0.000), as well as differences by age, nationality and education.

4.2 Analysis of Results by Subgroups of the Sample

In this section, the relationship between personal financial literacy and characteristics of sample; participants' financial choices and opinions were examined. Table 3 shows the mean percentage of correct responses' for entire survey and ANOVA has been used to detect if participants from various subgroups have differences in levels of financial knowledge.

Participants' educational background has a significant impact on their financial knowledge. The results for the entire survey clearly show that students from academic discipline Economic are more knowledgeable than students from Non-economical discipline. On average, the students from Economic discipline answered correctly 68% of the survey questions and from non-economical discipline 57%. The findings also suggest that participants from different level of education have different levels of financial knowledge. Generally, graduate students know more than the undergraduate students. The testing results of ANOVA indicate that the differences are statistically significant at the 0.01 level.

Table 3 shows that participants' financial knowledge varies within their demographic characteristics. The percentages of correct answers from the female participants (56%) were lower than those from the male participants (64%). The values of F-statistic suggest that these differences are highly significant. The participants from different age groups had different levels of financial knowledge. The group of youngest students (18-21) got the lowest scores (56%) and the group of oldest students (26 and up) reached the highest (64%). These results are as expected as knowledge grows over time. The different scores are statistically significant at the 0.01 level. The nationality has as well an influence to the level of financial literacy, as the difference between Estonians and non-Estonians correct answers scores is 6% and the results are statistically significant at the 0.01 level.

The differences in financial knowledge in subgroup named, Personal monthly net income, were statistically significant at the 0.01 level and the financial literacy level rose together with income. Students who did not want to reveal their income were at the lowest level (55%) of financial knowledge, on next level (58%) were students with monthly income under 300 EURO and at the highest level (69%) were students who earn over 1000 EURO per months.

Based on F-statistic values there were no obvious differences in these groups: Household size, Work experience, and Level of education of the parents.

Table 3 Mean percentage of correct responses by characteristics of sample and results of ANOVA

	Characteristics	Number	%
A.	**Education**		
	1. Academic discipline		
	a) Non-economic	446	57.37
	b) Economic	76	67.95
	F Statistic		(22.864)**
	2. Level of education		
	a) Applied higher educational studies	146	57.73
	b) Bachelor studies	220	57.56
	c) Master and Doctoral studies	121	64.29
	d) Combined studies	35	53.67
	F Statistic		(5.209)**
B.	**Demographic Characteristics**		
	1. Gender		
	a) Female	318	55.77
	b) Male	204	63.80
	F Statistic		(25.254)**
	2. Age groups		
	a) 18-21	250	55.94
	b) 22-25	177	60.49
	c) 26 and up	95	63.76
	F Statistic		(7.543)**
	3. Nationality		
	a) Estonian	418	60.18
	b) Non-Estonian	104	53.78
	F Statistic		(10.501)**
	4. Household size		
	a) Live alone	133	60.04
	b) Live with husband/ wife	136	58.56
	c) Live with husband/ wife and children	45	60.16
	d) Live with parents/grandparents	181	58.17
	e) Other	27	57.94
	F Statistic		(0.287)
C.	**Experience**		
	1. The work experience		
	a) 0 years	181	59.55
	b) 1 to 2 years	165	56.41
	c) 3 years and up	176	60.59
	F Statistic		(2.436)
D.	**Income**		
	1. Personal monthly net income		
	a) Under 300 EURO	239	58.22
	b) 301- 600 EURO	135	58.20
	c) 601 – 1000 EURO	56	61.61
	d) 1001 EURO and over	35	69.18
	e) Do not want to answer	57	54.51
	F Statistic		(4.161)**
E.	**Background**		
	1. Level of education of the parents		
	a) Higher education exists	314	59.03
	b) Higher education missing	208	58.72
	F Statistic		(0.036)

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

As the number of participants (Table 3) in the level of doctoral studies was lower than 1% of sample size, the answers have been taken into consideration together with master level.

Table 4 shows the mean percentage of correct responses of survey by subgroups, and results of ANOVA.

Table 4 Results of ANOVA and mean percentage of financial literacy level in cases of differing financial choices

F.	Students' financial choices	Number	%
	1. Currently available Financial services		
	Current Account		
	a) Yes	473	59.29
	b) No	49	55.25
	F Statistic		(2.190)
	Debit Card		
	a) Yes	422	60.75
	b) No	100	51.14
	F Statistic		(23.470)**
	Credit Card		
	a) Yes	126	61.17
	b) No	396	58.19
	F Statistic		(2.566)
	Saving Account		
	a) Yes	131	59.11
	b) No	391	58.84
	F Statistic		(0.021)
	Bank loan		
	a) Yes	136	62.29
	b) No	386	57.72
	F Statistic		(6.411)*
	Vehicle Lease		
	a) Yes	26	59.62
	b) No	496	58.87
	F Statistic		(0.041)
	Investment Services		
	a) Yes	34	68.91
	b) No	488	58.21
	F Statistic		(11.184)**
	Insurance		
	a) Yes	126	65.02
	b) No	396	56.96
	F Statistic		(19.394)**
	2. Planning of financial affairs		
	On a current basis, on a daily basis		
	a) No	421	60.08
	b) Yes	101	54.03
	F Statistic		(9.125)**
	On a monthly basis		
	a) No	318	59.48
	b) Yes	204	58.02
	F Statistic		(0.800)
	On a 3 months basis		
	a) No	441	58.08
	b) Yes	81	63.40
	F Statistic		(5.901)*
	On a 6 months basis		
	a) No	477	58.63
	b) Yes	45	61.90
	F Statistic		(1.335)
	On a 1 year basis		
	a) No	484	58.65
	b) Yes	38	62.22
	F Statistic		(1.355)
	On a several year basis		
	a) No	504	58.62
	b) Yes	18	67.06
	F Statistic		(3.760)
	Do not see the need to plan		
	a) No	498	59.09
	b) Yes	24	55.06
	F Statistic		(1.124)

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

Analysis of variance has been used to detect if participants' with different financial choices have different levels of knowledge. Based on earlier studies (Pires and Quelhas, 2015) available financial services have an impact on students' financial literacy level. Current study results show that financial services that had statistically significant effect were: Debit Card, Bank loan, Investment Services, Insurance, and financial affair planning periods one and three months.

Table 5 shows the mean percentage of correct responses of survey among subgroups and ANOVA has been used to detect if the participants' with different financial opinions have different levels of knowledge.

Table 5 Results of ANOVA and mean percentage of financial literacy level in cases of differing financial opinions

G..	**Students' financial opinions**	**Number**	**%**
	1. Interest about get more information		
	a)Yes	340	57.04
	b) No	182	62.40
	F Statistic		(10.477)**
	2. Have thought about retirement funding		
	a)Yes	292	59.59
	b) No	230	58.04
	F Statistic		(0.927)

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

In earlier studies (Goldsmith and Goldsmith, 1997; Chen and Volpe, 2002) there are several researchers suggested that financial literacy tends to be affected by interest about financial topics. Students were asked two questions: first about, if they have interest to get more information and second, to clear out, if they have interest about long term planning. The results show that the interest about get more information in field was statistically significant. Furthermore, students' with lower financial literacy level were more interested in topics.

4.3. Determining factors of personal financial literacy

The results in previous sections were shown the differences in 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. Table 6 reports means, standard deviation, and correlation coefficients of the independent variables. As shown, the coefficients among the independent variables are low. Typically, the correlation coefficient of 0, 60 or higher would indicate a serious multi-collinearity problem, but that is not a problem in current analysis.

The Forward Stepwise method was chosen for run the regression analysis. Table 7 reports the statistically significant results of logistic regressions. As suggested by the Chi-square values, the model has high

explanatory power. Another measure of the overall fit of the model is to assess its ability correctly classify observations. In current case, the observations that are correctly classified are much higher than the chance classification of 51%. Based on the results of the logistic regression analysis, men are 2.5 times more likely to be more knowledgeable about personal finance than women. The students studying economical discipline were 3.5 times more likely to be in a higher level of financial literacy group than students, who studied in other academic disciplines. The coefficient (B) of non-Estonians is negative and significant at the 0.05 level. Consistent with findings of ANOVA, the result suggests that non-Estonians are more likely to be less knowledgeable about personal finance than Estonians.

Table 6 Summary statistics and correlation coefficients

Variable	Mean	S.D.	Literacy	Nation.	Age	Academic discipline	Level of education	Gender	Interest	Investment	Insurance	Bank loan	Debit card	Income	Planning-daily	Planning-quarterly
Financial literacy	0,49	0,500	1													
Nationality	1,20	0,400	-0,134	1												
Age	1,70	0,758	0,096	0,050	1											
Academic discipline	0,15	0,353	0,203	-0,138	-0,183	1										
Level of education	2,086	0,879	0,017	0,175	0,191	0,52	1									
Gender	1,39	0,488	0,212	0,023	-0,033	-0,008	0,051	1								
Interest about finances	1,35	0,477	0,119	-0,083	0,117	0,006	0,001	0,057	1							
Investment	0,52	1,976	0,145	-0,112	0,134	0,045	0,098	0,170	0,002	1						
Insurance	1,69	2,998	0,109	-0,001	0,316	-0,055	0,016	0,108	0,113	0,123	1					
Bank loan	1,30	2,197	0,125	-0,001	0,319	-0,047	0,001	-0,037	0,051	0,020	0,185	1				
Debit card	1,62	0,788	0,176	-0,074	0,066	0,077	0,070	0,150	0,039	0,069	0,093	0,045	1			
Income	2,11	1,344	0,004	0,173	0,298	-0,018	0,138	0,045	0,071	0,007	0,120	0,022	-0,014	1		
Advance planning- daily	0,193	0,395	-0,112	-0,001	-0,071	-0,023	-0,031	-0,005	-0,053	-0,090	-0,072	-0,037	-0,057	0,039	1	
Advance planning - quarterly	0,155	0,362	0,056	-0,042	-0,021	0,093	0,006	0,080	0,153	0,037	0,018	-0,025	0,034	0,012	-0,210	1

Notes: Nation. = Participants' nationality. It is coded „1" if a participant is a Estonian, and „2" a Non-Estonian.
Age= Participants' age group. It is coded „1" if a participant is in the age group of 18-21, „2" in the age group of 22-25, „3" in the age group of 26 and up.
Academic discipline=Participants' academic discipline. It is coded „0" if a participant is from non-economic academic discipline, „1" from economic field.
Level of education=Participant's level of education It is coded "1" if a participant is studding at Applied higher education studies, "2" at Bachelor studies, "3" at Master or Doctoral, "4" at Combined studies
Gender=Participants' gender. It is coded „1" if a participant is Female, „2" is Male.
Interest= Participants' interest to get more information about financial services and monetary affairs planning. It is coded "1" if a participant is interested, "2" is not.
Investment=Investment Services. It is coded „0" if the investment services are not currently available for a participant, „8" if are available.
Insurance= Insurance. It is coded „0" if the insurance services are not currently available for a participant, „7" if are available.
Bank loan=Bank loan. It is coded „0" if the bank loan is not currently available for a participant, „5" if it is available.
Debit card= Debit card. It is coded „0" if the debit card is not currently available for a participant, „2" if it is available.
Income=Participants' personal monthly net income. It is coded „1" if a participant earns less than 300 EUR, „2" 301-600 EUR, „3" 601-1000 EUR, „4" 1001 EUR and over, „5" if participant refused to answer.
Planning-daily= Participants' choice to plan financial affairs in advance on a daily basis. It is coded „0" if a participant does not use this type of planning, „1" if that planning suits.
Planning quarterly= Participants' choice to plan financial affairs in advance on three months basis. It is coded „0" if a participant does not use this type of planning, „1" if that planning suits.

Table 7 The logistic regression Model

	Step 1		Step 2		Step 3		Step 4		Step 5		Step 6		Step 7	
	B	Exp(B)	B	Exp(B)	B	Exp(B)	B	Exp(B)	B	Exp(B)	B	Exp(B)	B	Exp(B)
Gender (Female)														
Male	0,882**	2,416	0,929**	2,532	0,977**	2,655	0,906**	2,437	0,934**	2,545	0,943**	2,568	0,927**	2,526
Discipline (Non-economic)														
Economic			1,303**	3,682	1,374**	3,951	1,326**	3,767	1,249**	3,487	1,247**	3,482	1,255**	3,508
Currently available financial services Bank loan					0,722**	2,059	0,698**	2,009	0,704**	2,021	0,693**	1,999	0,674**	1,961
Debit Card							0,718**	2,051	0,684**	1,983	0,664**	1,942	0,660**	1,934
Nationality (Estonian)														
Non-Estonian									-0,599*	0,549	-0,614*	0,541	-0,581*	0,559
Advance planning- daily											-0,570*	0,566	-0,552*	0,576
Interest to get additional information													0,396*	1,485
Constant	-0,382**	0,683	-0,579**	0,561	-0,795**	0,451	-1,341**	0,262	-1,198**	0,302	-1,071**	0,343	-1,206**	0,299
-2 log Likelihood	699,876		676,157		664,435		655,720		649,411		643,877		639,933	
Chi-Square	23,578**		47,297**		59,019**		67,734**		74,043**		79,577**		83,521**	
Adjusted R^2	0,059		0,116		0,143		0,162		0,176		0,189		0,197	
Correct Classification	60,5		63,8		63,8		63,8		64,8		65,7		65,9	
Chance Classification 51,0%														

Notes: *significant at the 0,05 level; ** significant at the 0,01 level or greater

Using a small calculation (1/Exp(B)N=1/0.559=1.788) the result could be presented on the contrary, that is to say from Estonians perspective and to state that is 1.8 times more likely they belong to group with higher level of financial literacy than non-Estonians.

The variables that affected level of knowledge in one-way ANOVA, as age, income, educational level pursued by students', currently available Insurance and Investment Services and advance planning quarterly, they no longer have any significant impact.

4.3.1 How different study fields affect financial literacy

Table 8 illustrates the gender distribution and financial literacy levels of students in different field of study.

Table 8 The differences of students' gender and financial knowledge in different fields of study

Faculty/field of study		Students' personal financial knowledge		Total	Gender	
		Less	More		Female	Male
Other	Count	137	97	234	185	49
	% within	58,5%	41,5%	100,0%	79,1%	20,9%
	% of Total	51,5%	37,9%	44,8%	58,2%	24,0%
Info technology	Count	11	36	47	12	35
	% within	23,4%	76,6%	100,0%	25,5%	74,5%
	% of Total	4,1%	14,1%	9,0%	3,8%	17,2%
Chemistry	Count	28	14	42	31	11
	% within	66,7%	33,3%	100,0%	73,8%	26,2%
	% of Total	10,5%	5,5%	8,0%	9,7%	5,4%
Mathematics	Count	8	9	17	11	6
	% within	47,1%	52,9%	100,0%	64,7%	35,3%
	% of Total	3,0%	3,5%	3,3%	3,5%	2,9%
Science of law	Count	11	7	18	15	3
	% within	61,1%	38,9%	100,0%	83,3%	16,7%
	% of Total	4,1%	2,7%	3,4%	4,7%	1,5%
Construction	Count	18	9	27	7	20
	% within	66,7%	33,3%	100,0%	25,9%	74,1%
	% of Total	6,8%	3,5%	5,2	2,2%	9,8%
Economy	Count	20	57	77	48	29
	% within	26,0%	74,0%	100,0%	62,3%	37,7%
	% of Total	7,5%	22,3%	14,8%	15,1%	14,2%
Mechanics	Count	8	16	24	3	21
	% within	33,3%	66,7%	100,0%	12,5%	87,5%
	% of Total	3,0%	6,3%	4,6%	0,9%	10,3%
Energetics	Count	25	11	36	6	30
	% within	69,4%	30,6%	100,0%	16,7%	83,3%
	% of Total	9,4%	4,3%	6,9%	1,9%	14,7%
Total	Count	266	256	522	318	204
	% within	51,0%	49,0%	100,0%	60,9%	39,1%
	% of Total	100,0%	100,0%	100,0%	100,0%	100,0%
Chi-Square,		54,469**			131,096**	

Note: ** Significant at the 0.001 level

Students were distributed to nine different groups, bearing on mind if the fields of study were scientific or Math based. The Science of Law was added to the list as an exception just for curiosity as the name includes the word science. The section "Other" contained the data of those participants whose field of study was education, art, social work, flight attendance, nursing or medicine. The breakdown is based on the views

suggested by Mandell (2008) that the level of financial literacy of students in scientific fields of study is higher and Chen & Volpe (2002) that women prefer courses with less mathematics and science. The scores of students' personal financial knowledge were distributed in to two groups (less or more) based on the median result of financial literacy test. Same method is used by Chen and Volpe (1998). The cross tabulation and Chi-square tests were run and the statistically significant results showed us that the biggest part (51%) of students with less knowledge belonged to the group Other and 79% of students in this group were female.

Figure 1 describes the differences in financial literacy levels depending on gender and the field of study.

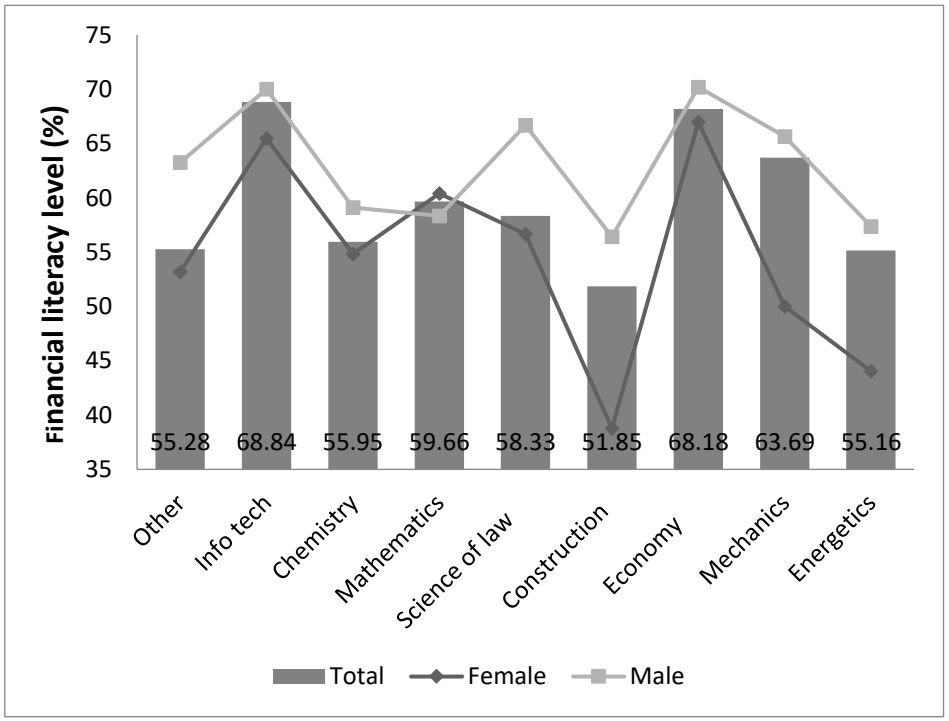

Figure 1 Differences in financial literacy levels depending on gender and the field of study

To show the differences in female and male students' financial literacy levels in different fields of study a two-way ANOVA test and mean values of participants' results were used. F-statistic was used to assess significance and the results obtained were statistically significant at the level 0.001. Male students' financial literacy level was higher in most of study fields except the Mathematics where female students got 2% higher score. The highest scores got the students whose study field was Economy, accordingly females 67% and males 70%. The Info technology came next where females got 65% and males 70%.

4.3.2 How interest about financial affair and monetary planning affect to financial literacy

The test results show that in this case the lowest level of interest was among students studied in field of Construction and Science of Law where the level of female students was accordingly 26% and 83% and the financial literacy mean scores were 58% and 52%.

Table 9 Relationship between the field of study and the interest to get additional information about financial services and monetary affairs planning

Crosstab

			Field of Study									Total
			Other	IT	Chem	Math	Law	Constr	Econ	Mechan	Energ	
Do you want to get more information about financial services and monetary affair planning?	Yes	Count	153	29	33	12	10	15	49	16	23	340
		% within Field of Study	65,4%	61,7%	78,6%	70,6%	55,6%	55,6%	63,6%	66,7%	63,9%	65,1%
	No	Count	81	18	9	5	8	12	28	8	13	182
		% within Field of Study	34,6%	38,3%	21,4%	29,4%	44,4%	44,4%	36,4%	33,3%	36,1%	34,9%
Total		Count	234	47	42	17	18	27	77	24	36	522
		% within Field of Study	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%

Notes: Chi-Square=5.756 significant at the 0.675 level

As the test significance was over 0.05 the generalizations are not allowed.

Table 10 Relationship between the participants' gender and the interest to get additional information about financial services and monetary affairs planning

Crosstab

			Gender		Total
			Female	Male	
Do you want to get more information about financial services and monetary affair planning?	Yes	Count	214	126	340
		% within Gender	67,3%	61,8%	65,1%
	No	Count	104	78	182
		% within Gender	32,7%	38,2%	34,9%
Total		Count	318	204	522
		% within Gender	100,0%	100,0%	100,0%

Notes: Chi-Square=1.674 significant at the 0.115 level

The test significance was over 0.05 and the generalizations cannot been made, but in current case it can be shown that the level of interest to get additional information about financial services and monetary affairs planning among male and female students was quite similar. Male students' interest was just 5% lower.
Table 11 describes the relationship between selected variables and students' interest about financial services and monetary affair planning. Factors affecting financial literacy found by regression analysis in the present and earlier studies were selected as variables to describe the background of students with an interest. Statistically significant results showed that students with lower financial literacy level (below the median 57.14% level), Estonians and from youngest (18-21) age group had more curiosity. Academic discipline did not affect the curiosity in current case. Participants who were not owners of Bank loan, Debit card or Investment services were slightly more interested to get information about financial services and monetary planning.

Table 11 Relationship between selected variables and students' interest about financial services and monetary affair planning

Do you want to get more information about financial services and monetary affair planning?	Total	Financial literacy		Acad. discipline		Nationality		Age			Bank loan owner		Debit card owner		Investment services owner	
		Less	More	Econ.	Non-Econ.	Est.	Non-Est.	18-21	22-25	26 and up	Yes	No	Yes	No	Yes	No
Yes Count	340	188	152	49	291	264	76	174	115	51	83	257	271	69	22	318
% within	100.0%	55,3%	44,7%	14,4%	85,6%	77,6%	22,4%	51,2%	33,8%	15,0%	24,4%	75,6%	79,7%	20,3%	6,5%	93,5%
% of column	65.1%	70,7%	59,4%	64,5%	65,2%	63,2%	73,1%	69,6%	65,0%	53,7%	61,0%	66,6%	64,2%	69,0%	64,7%	65,2%
No Count	182	78	104	27	155	154	28	76	62	44	53	129	151	31	12	170
% within	100.0%	42,9%	57,1%	14,8%	85,2%	84,6%	15,4%	41,8%	34,1%	24,2%	29,1%	70,9%	83,0%	17,0%	6,6%	93,4%
% of column	34.9%	29,3%	40,6%	35,5%	34,8%	36,8%	26,9%	30,4%	35,0%	46,3%	39,0%	33,4%	35,8%	31,0%	35,3%	34,8%
Total Count	522	266	256	76	446	418	104	250	177	95	136	386	422	100	34	488
% of Total	100.0%	51,0%	49,0%	14,6%	85,4%	80,1%	19,9%	47,9%	33,9%	18,2%	26,1%	73,9%	80,8%	19,2%	6,5%	93,5%
Note:		Chi-Square= 7,337 significant at the 0.004 level		Chi-Square= 0,017 significant at the 0.496 level		Chi-Square= 3,608 significant at the 0.036 level		Chi-Square=7.682 significant at the 0.021 level			Chi-Square=1,364 significant at the 0.144 level		Chi-Square=0,814 significant at the 0.217 level		Chi-Square=0,003 significant at the 0.546 level	

Table 12 Differences in students' financial information sources viewed through the financial literacy and descriptive features

	Financial literacy		Total %	Age			Gender		Acad. discipline		Nationality	
	More knowledge	Less knowledge		18-21	22-25	26 and up	Female	Male	Econ.	Non-Econ.	Est.	Non-Est.
What are the sources of information most influence / influenced your decision of the financial services acquisition ?												
The information given in the Bank's service Count	62	83	145	70	45	30	100	45	16	129	113	32
% within row	42,8	57,2	100.0	48,3%	31,0%	20,7%	69,0%	31,0%	11,0%	89,0%	77,9%	22,1%
% within column	24,2	31,2	27,8	28,0%	25,4%	31,6%	31,4%	22,1%	21,1%	28,9%	27,0%	30,8%
Chi-Square and Sig	3,172*	0,046		1,179	0,555		5,459*	0,012	2,005	0,099	0,579	0,259
Advertisement Count	2	9	11	Chi-Square test conditions are not met (TCANM)								
% within row	18,2	81,8	100,0									
% within column	0,8	3,4	2,1									
Chi-Square and Sig	4,282*	0,036		TCANM			TCANM		TCANM		TCANM	
Advices from friends / relatives who are not employed in financial services Count	36	29	65	30	28	7	35	30	8	57	55	10
% within row	55,4	44,6	100,0	46,2%	43,1%	10,8%	53,8%	46,2%	12,3%	87,7%	84,6%	15,4%
% within column	14,1	10,9	12,5	12,0%	15,8%	7,4%	11,0%	14,7%	10,5%	12,8%	13,2%	9,6%
Chi-Square and Sig	1,195	0,168		4,140	0,126		1,560	0,133	0,303	0,370	0,959	0,211
Advices from friends / relatives who work in the field of financial Count	116	106	222	109	76	37	136	86	37	185	181	41
% within row	52,3	47,7	100,0	49,1%	34,2%	16,7%	61,3%	38,7%	16,7%	83,3%	81,5%	18,5%
% within column	45,3	39,8	42,5	43,6%	42,9%	38,9%	42,8%	42,2%	48,7%	41,5%	43,3%	39,4%
Chi-Square and Sig	1,593	0,120		0,628	0,731		0,019	0,482	1,379	0,147	0,513	0,273
Do not use / would not use any data source Count	24	31	55	27	16	12	33	22	9	46	42	13
% within row	43,6	56,4	100,0	49,1%	29,1%	21,8%	60,0%	40,0%	16,4%	83,6%	76,4%	23,6%
% within column	9,4	11,7	10,5	10,8%	9,0%	12,6%	10,4%	10,8%	11,8%	10,3%	10,0%	12,5%
Chi-Square and Sig	0,719	0,241		0,822	0,644		0,022	0,496	0,161	0,407	0,531	0,284

Notes: *Significant at 0,05 level
TCANM - Test conditions are not met

Table 12 shows the financial information sources that influence students on the financial services acquisition and describes participants who made these choices. The first popular choice was “Advices from friends / relatives who work in the field of financial”, as 43% of the participants marked this, but the results were not statistically significant. “The information given in the Bank’s service” was statistically significant and the second popular choice, as this choice was marked by 27% of students, including 31% of females, 22% of males and 57% of financially less knowledgeable students who participated in poll. Remarkable was result that only 2% of participants rely on advertising. Totally 11% of participants admitted that they do not use any data sources for making decisions of the financial services acquisition.

4.3.3 How financial affair planning affect financial literacy

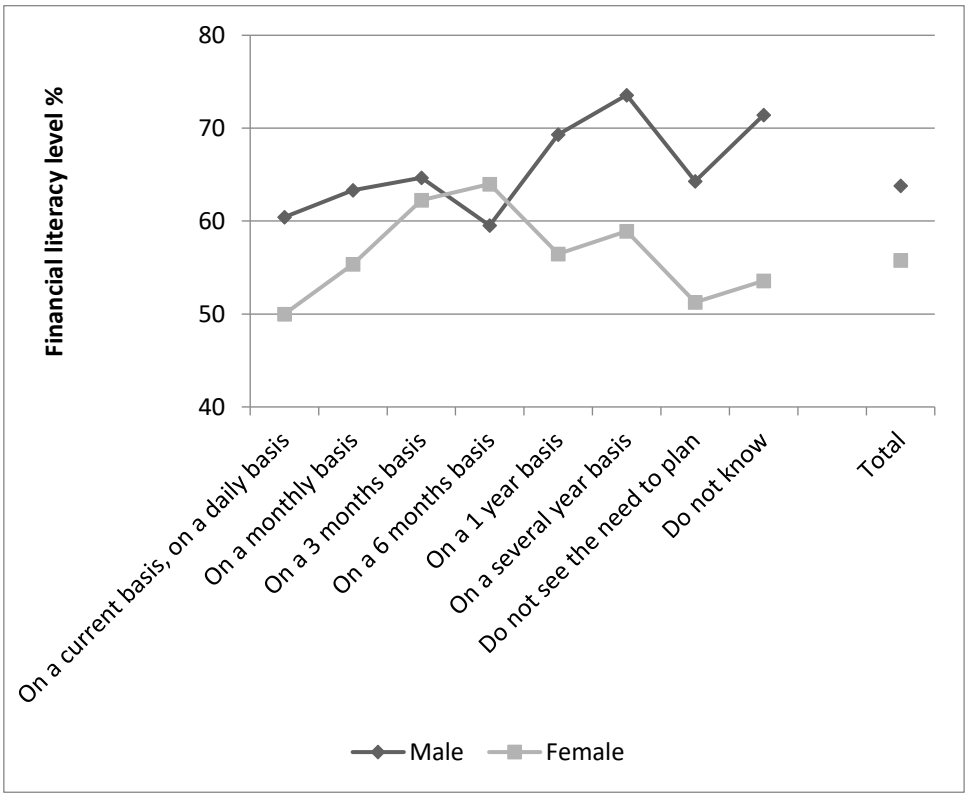

Figure 2 Differences in students' financial planning depending on financial literacy level

As the result of the regression analysis the statistically significant factor for financial literacy level was financial affairs advance planning daily. To describe the background the ANOVA (F=5,321 at Sig= 0,000) and Chi-Square tests were run and results were presented in Figure 2 and Table 13. In conclusion, there was a trend in the choices of male students, where the length of the planning period rose as the level of financial literacy increased. Most popular period for advance planning was one months and that choice was similar for male and female participants. Both gender groups had financial literacy level very close to group mean value despite the fact that male and female students' mean scores gap was 8%.

Viewed differences regarding financial planning periods by nationalities the results were not statistically significant. Notable was the difference (11%) in advance planning period "one month", what was preferred by non-Estonians.

Table 13 Differences in students' financial planning depending on gender and nationality

	Gender		Nationality		Total
	Female	Male	Estonian	Non-Estonian	
How long in advance do you plan your financial affairs (the expected revenues, the necessary costs and predictable financial situation)?					
On a current basis, on a daily basis					
Count	62	39	81	20	101
%	61,4	38,6	80,2	19,8	100,0
% within column	19,5	19,1	19,4	19,2	19,3
On a monthly basis					
Count	136	68	154	50	204
%	66,7	33,3	75,5	24,5	100,0
% within column	42,8	33,3	36,8	48,1	39,1
On a 3 months basis					
Count	42	39	68	13	81
%	51,9	48,1	84,0	16,0	100,0
% within column	13,2	19,1	16,3	12,5	15,5
On a 6 months basis					
Count	24	21	36	9	45
%	53,3	46,7	80,0	20,0	100,0
% within column	7,5	10,3	8,6	8,7	8,6
On a 1 year basis					
Count	21	17	32	6	38
%	55,3	44,7	84,2	15,8	100,0
% within column	6,6	8,3	7,7	5,8	7,3
On a several year basis					
Count	8	10	17	1	18
%	44,4	55,6	94,4	5,6	100,0
% within column	2,5	4,9	4,1	1,0	3,4
Do not see the need to plan					
Count	17	7	20	4	24
%	70,8	29,2	83,3	16,7	100,0
% within column	5,3	3,4	4,8	3,8	2,1
Do not know					
Count	8	3	10	1	11
%	72,7	27,3	90,9	9,1	100,0
% within column	2,5	1,5	2,4	1,0	2,1
Total					
Count	318	204	418	104	522
%	60,9	39,1	80,1	19,9	100,0
% within column	100,0	100,0	100,0	100,0	100,0
Chi-Square and Significance	10,922	0,142	7,158	0,413	
Have you thought about retirement funding?					
Yes					
Count	178	114	230	62	292
%	61,0	39,0	78,8	21,2	100,0
% within column	56,0	55,9	55,0	59,6	55,9
No					
Count	140	90	188	42	230
%	60,9	39,1	81,7	18,3	100,0
% within column	44,0	44,1	45,0	40,4	44,1
Total					
Count	318	204	418	104	522
%	60,9	39,1	80,1	19,9	100,0
% within column	100,0	100,0	100,0	100,0	100,0
Chi-Square and Significance	0,000	0,527	0,712	0,232	

To evaluate students' opinions about long run planning the question concerning retirement funding was analyzed. The results show that there were no differences in male and female answers, as 56% of participants from both gender groups were thought about retirement funding. Differences in responses by nationality were small and were not statistically significant. Meanwhile, non-Estonian participants thought more about retirement funding. Based on ANOVA test (Table 5) the level of students' financial literacy who had thought to the question, was 1.5% higher.

4.3.4 Relationships between self-assessment, confidence and financial literacy

Table 14 Student' self-assessment viewed through the financial literacy and

Self-assessment about financial knowledge?	**Financial literacy level**			**Total**	**Gender**	
	Low	**Medium**	**High**		**Female**	**Male**
High Count	12	18	12	42	16	26
% within	28.6%	42.9%	28.6%	100.0%	38,1%	61,9%
% within column	4.5%	8.6%	25.5%	8.0%	5,0%	12,7%
Medium Count	**140**	**128**	**29**	**297**	**188**	**109**
% within	47.1%	43.1%	9.8%	100.0%	63,3%	36,7%
% within column	**52.6%**	**61.2%**	**61.7%**	**56,9%**	**59,1%**	**53,4%**
Low Count	106	56	6	168	104	64
% within	63.1%	33.3%	3.6%	100.0%	61,9%	38,1%
% within column	39.8%	26.8%	12.8%	32.2%	32,7%	31,4%
Hard to say Count	8	7	0	15	10	5
% within	53.3%	46.7%	0%	100.0%	66,7%	33,3%
% within column	3.0%	3.3%	0%	2.9%	3,1%	2,5%
Total Count	266	209	47	522	318	204
% of Total	51.0%	40.0%	9.0%	100.0%	60,9%	39,1%
Note:	Chi-Square=37.591 significant at the 0.000 level				Chi-Square= 10,174 significant at the 0.017 level	

Source: Author's own preparation based on Anonymous (2019)

Notes: The highest frequency and percentage are highlighted by bold.

Previous studies (Goldsmith and Goldsmith, 1997; Chen and Volpe, 2002) observe that women have lower confidence in and less interest to personal finance than men do. In this topic two questions were asked to answer. First question to examine students' interest about financial services and monetary affair planning (results in Table 10) and the second asks them to evaluate their own financial knowledge (results in Table 14). The level of own financial literacy was assessed rightly by 246 students, which accounted for 47% of the total number of respondents. 297 students, which were 57% of the respondents, evaluated their financial knowledge to the medium level and 168 students, which were 32%, evaluated their financial knowledge to the low level. Previous researches in Estonia have made the conclusion that if the self-assessment about financial knowledge is not high that means it is quite adequate (Faktum & Arico, 2010; Anonymous, 2019). Students that assessed their financial knowledge to the high level (42 students) could be counted as self-

confident, as well as those (140 students) whom financial literacy level was low but proposed their level on medium.

Table 15 Descriptive statistics about gender and financial literacy levels of students' who assessed their knowledge to Medium level

Gender	Level of knowledge	Financial literacy level	Count
Female	Low	46,5%	98
	Medium	70,2%	78
	High	86,9	12
			188
Male	Low	48,1%	42
	Medium	70,7%	50
	High	90,8	17
			109

The results suggested that 52% of female and 39% of male students who assessed their financial literacy level as Medium had knowledge at a Low level. In the light of these results, it can be argued that contrary to the results of previous studies, female students are rather confident.

Because of limits, the issue of relationship between confidence and financial literacy is not discussed in depth in this paper however it needs to be done in the future.

4.4 Discussion

The target of this study was to explore deeper the financial choices and opinions of students. For this purpose, the participants' financial knowledge and the factors influencing them were first assessed and then analyzed their impact on the students' financial choices and opinions.

The results obtained during this work show that the level of financial literacy of students is low. Altintas (2011) and Chen and Volpe (1998) came to the same results in their financial literacy studies surveying the level of financial literacy of Turkish and US students, respectively. Pires and Quelhas (2015) research about Portuguese university students financial literacy gave opposite results, means students financial knowledge was good.

Earlier studies conducted among Estonian citizens have no significant differences in the level of financial literacy of women and men. Also, there were no significant differences between the girls' and boys' financial literacy skills, as revealed in PISA 2012 test results OECD (2014). Differences were marked in previous study of male and female university students' financial literacy (Anonymous, 2013) and current study revealed the same, that men have a higher level of financial literacy than women. To the same result came Atkinson et al. (2006) in UK, Goldsmith and Goldsmith (1997; 2006) and Chen and Volpe (1998) while studying the US students, Lusardi et al. (2010), who studied the US youth and Monticone (2010), who examined the financial literacy of the Italian population. Wagland and Taylor (2009), who examined the level of financial literacy of Australian students, came to the result that the gender does not affect the level of financial literacy. Altintas (2011), whose study was conducted in Turkey, came to the result that the level of female financial literacy is higher than men's.

As earlier results, it were noted that older students are in higher financial literacy levels (Atkinson et al., 2006; Mändmaa, 2019; Chen and Volpe, 1998). In the current research the regression analysis gave the outcome that age would not affect the level of financial literacy. Wagland and Taylor (2009) in researching Australian students' financial literacy came to the same result.

The study revealed that students with an economic academic discipline have better financial knowledge than students who do not learn in the economic direction. The same result was obtained by (Anonymous, 2019), Chen and Volpe (1998), Pires and Quelhas (2015). Altintas (2011) in his study exposed that academic discipline does not affect the level of financial literacy.

Analyzing the impact of nationality on financial literacy, it turned out that Estonians have a higher level of financial literacy compared to non-Estonians. The same results were obtained in Faktum and Ariko's (2010) and Mändmaa, 2019, financial literacy study and in PISA 2012 test results OECD (2014).

The findings of this study show that the characteristics of sample, as the levels of education students pursue, household size, work experience, personal monthly income and higher education of parents do not affect significantly the level of financial literacy Mändmaa and Zhiguleva (2013) got similar results to this study about the levels of education students pursue, work experience, and higher education of parents but in contrast, Chen and Volpe (1998) came to the result that working experience does affect the level of financial literacy of students. The impact of educational level to the level of financial literacy is reported in survey results by Atkinson et al. (2006) and Chen and Volpe (1998). The result that higher education of students' parents affects the students' level of financial literacy has been receive by Altintas (2011) and Lusardi et al. (2010) in their surveys.

As previous research has found the financial literacy can have important implications for financial behavior, as people with low financial literacy are less likely to participate in the stock market (van Rooij et al. 2007), less likely accumulate and manage wealth effectively (Hilgert et al. 2003; Stango and Zinman, 2007), and less likely to plan for retirement (Lusardi and Mitchell, 2006, 2007, 2009).

The survey statistically significant results show that only 7% of students hold the investment services and they belong to group of financially more knowledgeable, as well as these who provide their welfare through insurance services (25% of students). 25% of participants own Savings account, and 56% of students have thought about retirement funding but the level of students financial literacy does not make any significant differences in these cases.

Lusardi and Tufano (2009) noted that people with low financial literacy are more likely to have problems with debt and Reed (2008) marked that the financial situation of today's youth in USA is characterized increasingly by high levels of debt. Current study results show that loans are not very popular among students as 24% of participants use credit cards and 26% have bank loan, while their average financial literacy score is 61% and 62% respectively.

In a 2009 conducted survey among undergraduate students in USA, 84% of students said they needed more education on financial management topics (Sallie Mae, 2009). In current study to the question "Do you want to get more information about financial services and monetary affairs planning?" 65% of the participants answered "yes". More curiosity had students with lower financial literacy level (below the median 57.14% level), Estonians and participants from youngest (18-21) age group.

Students were asked about sources of information most influenced their decision of the financial services acquisition and the first popular choice was “Advices from friends / relatives who work in the field of financial”. 43% of the participants marked this, but the results were not statistically significant. “The information given in the Bank’s service” was statistically significant and the second popular choice. 27% of students, including 31% of females and 22% of males marked that.

Previous studies (Goldsmith and Goldsmith, 1997; Chen and Volpe, 2002) observe that women have lower confidence in and less interest to personal finance than men do. In current case the level of interest to get additional information about financial services and monetary affairs planning among male and female students was quite similar. Male students’ interest was just 5% lower. The study results suggested that 52% of female and 39% of male students who assessed their financial literacy level as Medium had knowledge at a Low level. So, it can be argued that contrary to the results of previous studies, female students are rather confident.

Researchers (Chen & Volpe, 2002; Mandell, 2008) suggested that the level of financial literacy of students in scientific fields of study is higher and that women prefer courses with less mathematics and other number-oriented science. Results show that male students’ financial literacy level was higher in most of study fields except the Mathematics where female students got 2% higher score. The highest scores got the students whose study field was Economy, accordingly females 67% and males 70%. The Info technology came next where females got 65% and males 70%. The gender distribution based on the total number of women and men involved was as follows: Economy 15% women and 12% men; Info technology 4% women and 17% men. 58% of female students enrolled in the group “Other”, where the average level of financial literacy was 53% for women and 63% for men. (Table 8) Therefore, we can conclude that in science and mathematics-based areas the level of financial literacy is higher and women prefer non-numerical fields of study.

One of the statistically significant factors for financial literacy level of the regression analysis was financial affairs advance planning daily. The most popular period for advance planning was one months and that choice was similar for male and female participants. There was a trend in the choices of male students, where the length of the planning period rose as the level of financial literacy increased.

5. Conclusions

This study had two purposes: First, to examine the relationships between the financial literacy and university students' financial opinions and choices, and secondly, to explore the impact of socio demographic characteristics to the participants' financial literacy, opinions and choices.

The study analyzed the questionnaire survey results that were collected from 522 university students from 13 different higher education institutions.

To examine the relationships participants' financial knowledge was assessed and the factors influencing the financial literacy were analyzed using the logit regression model. The overall mean of correct answers for the survey was about 59% and on average women knew less about personal finance than men. Results of regression analyze shown that statistically significant impact on the financial literacy had factors as gender, nationality, academic discipline, and financial choices and opinion, as holding a debit card, a bank loan,

plan the financial affairs in advance on a daily basis and an interest to get more information about financial services and monetary affairs.

The cross-tabulation, Chi-square and ANOVA test were used to analyze the impact of educational and demographical characteristics to the participants' financial literacy, opinions and choices.

Students studied in the science or mathematics oriented subjects, have learned how to do research and solve problems and the results shown that they were more knowledgeable in finance (Figure 1), especially male (75%) students. There was one exception, but despite that, it could be conclude that abilities how to approach a problem and how to research it, are very important and in the future the financial education should be taught intertwined with these skills.

To find out what could have the influence on students' interest the question "Do you want to get more information about financial services and monetary affairs planning?" was asked and results analyzed. 65% of the participants answered "yes" including 62% of male and 67% of female students. More curiosity was among students with lower financial literacy level (below the median 57.14% level), in Estonians and in participants from youngest (18-21) age group. Students studied in the field of Construction or Science of Law had the lowest interest and compared to other study areas, the Construction was with lowest average financial literacy level. Earlier studies revealed that low levels of financial literacy can be explained by the lack of motivation to learn. This is an argument what needs future research as in current case the results can't give the obvious answer.

Analyze about students' financial information sources were found that the first popular choice was "Advices from friends / relatives who work in the field of financial". "The information given in the Bank's service" was statistically significant and the second popular choice and that choice was more preferred by women (69%) and by financially less knowledgeable students (57%). Remarkable was result that only 2% of students relyed on advertising.

Students' most popular period for advance planning of financial affairs was one months and that choice was similar for male and female participants. The higher level of financial literacy had trend to longer planning period, especially for male participants'. (Figure 2) This can be conclud, wiser students make wiser - far reaching choices.

To find out if the women have lower confidence, the question about self-assessment was asked and the answers were analyzed. The level of own financial literacy was assessed rightly by 47% of the total number of respondents. 52% of female and 39% of male students who assessed their financial literacy level as Medium had knowledge at a Low level. In the light of these results, it can be argued that female students were rather confident.

Because of limits, the issue of relationship between confidence and financial literacy is not discussed in depth in this paper however it needs to be done in the future.

The main goal of this study was more deeply examine personal financial opinions and choices of university students in Estonia to give the results what will enable to identify needs and gaps in financial education provision to develop the field.

The important fact what was already earlier known but got confirmation with current study results, is that there is a gap between females and males financial literacy levels what should be taken to account when

design curriculum for personal finance courses. This study could not give the straight answers but show the directions how to move on. So, it is necessary to continue research with bigger sample sizes, in different study fields and ask students standpoints about financial education – what, where, when have been taught or should be taught or topics desired to know. That information together with earlier published thoughts could help educators to develop financial education to much higher level.

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