ECONOMICS AND CULTURE 16(2), 2019

DOI: 10.2478/jec-2019-0024

SENIOR DIGITAL UP-SKILLING – ERASMUS PLUS PROGRAMME PROJECT DIAL CASE STUDY

Iveta Cirule[1], Monta Balta[2], Irena Komarova[3], Ina Gudele[4]

[1]NGO Project Net, Riga, Latvia, projectfund@inbox.lv

[2]NGO Project Net, Riga, Latvia, monta.balta7@gmail.com

[3]RISEBA University, Riga, Latvia, irena.komarova@riseba.lv

[4]Internet Association Latvia, Riga, Latvia, ina.gudele@gmail.com

Abstract

Research purpose. With the current and progressive ageing of the population globally, in Europe over the past three decades, the urgency of creating a specific theoretical and educational model for older adults, in which the professional purpose is not the most important, is rising. Senior digital up-skilling is one of the pathways to widen the horizon of senior citizens (aged 55 plus) to be socially included in both society and labour market. The research article reveals the results of the project 'Digital Acquisition through Intergenerational Learning' (DIAL No. 2017-1-LV01-KA204-035455, Erasmus Plus programme) senior survey on training needs of digital skills from Latvia.

Design/Methodology/Approach. The research was carried out based on a quantitative survey conducted in four project partner countries in 2018, totally reaching out 1003 respondents. The sample of Latvia represents 236 adult learners, aged 55 plus. The survey was conducted based on two main scales: 'skill self-assessment and study needs' and four subscales 'computer essentials, communication and collaboration, hardware and Internet'. The main aim of the research was to estimate digital literacy level among senior citizens in project countries and develop training and teaching materials for adult learners and teachers based on survey results.

Findings. The main finding reveals the senior digital skill self-assessment and study needs. The majority of respondents revealed that they lack skills of communication in social media; at the same time they are willing to learn how to use Facebook and Viber, but they are not interested to use WhatsApp and Twitter for communication purposes with friends and family. The respondents are interested in apprehending video skills via mobile phones and e-governance service tools. These are only some findings out of almost 70 survey statements.

Originality/Value/Practical implications. The training materials in five languages (English, Latvian, Portuguese, Turkish and Greek) were developed based on the senior digital skills self-assessment and study needs survey. This is a practical intellectual output and value of the project DIAL – creation of innovative teaching materials for senior digital up-skilling.

Keywords: Education; Non-formal education; Adult learners; Senior students

JEL codes: A29

Introduction

The ageing process of the world's population is affecting our society as such. Maturing is a natural process. The elderly population symbolizes the essential and ever-growing part of our European community, economy and society. Regardless of the on-going situation, this highlights such questions as to how the member states can best safeguard that these citizens are socially well established, are actively engaged and can relish in their rights.

The research article reveals the results of project 'Digital Acquisition through Intergenerational Learning" (DIAL No. 2017-1-LV01-KA204-035455, Erasmus Plus programme) senior survey on training needs of digital skills from Latvia. The main survey aim was to assess the training study needs for seniors in four project partnership countries – Latvia, Portugal, Turkey and Cyprus – that need to be improved in order to develop on-line (*Moodle* platform) teaching and training materials. The main

research question is what are the teaching and training needs of senior citizens in Latvia. The research is based on a quantitative survey conducted in four project partner countries in 2018 totally reaching out 1003 respondents. Latvian sample represents 236 adult learners aged 55 plus.

The training materials in five languages (English, Latvian, Portuguese, Turkish and Greek) were developed based on the senior digital skill self-assessment and study needs survey. These training materials will be publicly available on *Moodle* platform for adult learners in June 2019, free of charge. This is a practical intellectual output and value of the project DIAL – creation of innovative teaching materials for senior digital up-skilling.

Literature Review

An innovative and skill development oriented programme created on the principles of intergenerational and lifelong learning (LLL) opportunities ensures that seniors (adults aged 55 plus), as it is stated in the Digital Competence Reference Framework of the EC (2016), obtain important digital competences with the participation of their significant others (i.e. children, grandchildren), hence backing up in a detailed way their social inclusion, e-access and participation, personal growth and active ageing.

Although a number of senior citizens enjoy remarkable health conditions, the difficulties that arise with ageing sometimes prevent the elderly from obtaining goods and/or services as well as the ability of living independently. Granting accessibility to everyone is equally a matter of fundamental rights and an essential part for making the most of the seniors' social and economic potential.

According to the Europe 2020 Strategy for smart, sustainable and inclusive growth (EC, 2010), the development of LLL and skills is recognized as a key component with regard to the on-going economic crisis, population ageing and EU's overarching economic and social strategy.

Studies show that elders lack digital literacy skills and due to digital gap their social participation and ability to follow information significantly decreases. Elders lack not only an upgraded digital skill set, but also distrust operations related to purchases of electronic services online and are more likely to use traditional over social media; however, they have a growing interest in becoming familiar with e-mail and Facebook usage (Nimrod, 2016; Román-García et al, 2016). A study carried out in 2017 highlighted a paradox that experience is a crucial factor in digital skill apprehension process for elderly; however, without indispensable support and accompaniment it is rather difficult to implement this process. One of the ways to provide such support is by involving family and other close companions not only to assist in the learning process, but also to help elders understand the utility of digital skills for their own benefit (Shreurs et al, 2017; Quan-Haase et al, 2017).

The economic crisis has highlighted the major importance of adult learning and what role it can play in obtaining the Europe 2020 targets by allowing the adults to boost their ability to adapt to the changes in the labour market, domestic life and society. Adult learning grants the means of up-skilling or re-skilling those affected by age and long-term unemployment, as well as making significant contribution to social inclusion, active citizenship and personal improvement.

Still, there is rising consensus that the adult learning is currently the most fragile link in establishing a national, LLL system. Cooperation in adult learning activities has fallen from 9.8% of the 25- to 64-year-old demographic group in 2005 to only 10.7% in 2014, therefore making the increased 'ET2020' an objective for 15% and by 2020 an even more significant challenge (EC, 2015).

'The Eurydice Report for Adult Education and Training' published in 2015 started more significant challenges in dealing with adults' basic skill levels and their shortfalls which undeniably influence the economy and social cohesion: (1) approximately one in five adults possesses low literacy level and numeracy skills and nearly one in three shows very low or no information and communication technology (ICT) skills at all; (2) adults with respectable education and training need to have at least a chance to benefit from their lifelong intellectual investment; (3) at the same time countries' policy agendas commonly focus on the admission of the LLL for those adults who are lacking the basic skills or who do not have sufficient qualifications since they rarely specify distinct aims that are sought to be reached.

ICT has become a more interesting subject for elders since 2000s, as a study showed that 93% of elders at the age of 75+ did not use Internet at the time, while in 2016 that number had descended close to 50% (Orlov, 2016). Jacobson et al. (2017) researched the use of mobile devices among seniors and came to a conclusion that there is a significant technological knowledge gap between generations and 'seniors are still largely lagging behind other age groups'. The concept of 'silver surfers', referring to elders easily apprehending modern communication channels and tools, was described as not yet actual, emphasizing the urge to reduce disparities of intergenerational gap of technology use.

When developing study programmes for elders, it is important to take into account biological processes also in the human body, that is, the fact that the working memory deteriorates with age. Knowledge of such cognitive changes can help to adapt the best learning tools, for instance, creating materials describing step-by-step actions for the apprehensible activities with computer, rather than practice a lecture-based approach, which is proved to be less effective among elders (Heaggans, 2012).

Among the reasons considered to be pro-integrating the silver generation into digital world, it is worth highlighting 'independence' as a significant factor for seniors, as the so-called 'on-liner' elders admit that Internet helps them to stay independent for a longer period of time as they age (Seifert & Schelling, 2018).

Methodology

The research development is based on a quantitative survey conducted in four project partner countries in 2018 totally reaching out 1003 respondents. Latvian sample represents 236 adult learners aged 55 plus. The survey was conducted based on two scales – skill self-assessment (Likert scale 1–4) and study needs (yes/no reply options) – and four subscales: computer essential, communication and collaboration, hardware and Internet. The main aim of the research was to estimate the situation in project countries and, based on survey results, develop training and teaching materials for adult learners and teachers (Fig. 1).

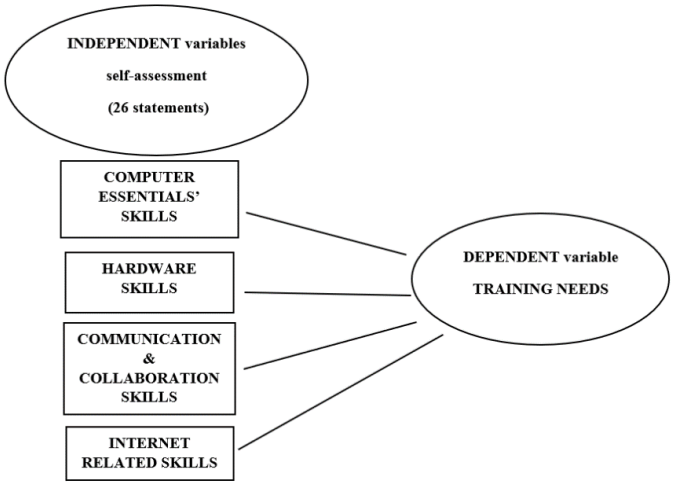

Fig. 1. Survey conceptual model *(*Source: authors' compilation)

The survey was launched in November 2017 via project online platform http://survey.dialproject.net/ created by project partnership in English, Latvian, Turkish, Greek and Portuguese. Data collection was on-going for 3 months until January 2018.

The demographical description of Latvia's sample is as follows: Latvia's sample was collected by regional survey coordinators (total three persons) by visiting senior citizens at home and public buildings (library, elderly houses and local municipality). Regional coordinators distributed survey in hard copies as senior citizens in Latvia lack the skills to fill online survey and they simply do not have access to Internet and/or computer at home.

Latvia's sample consists of 236 respondents (175 females and 61 males), which is a quite regular gender misbalance in this age group in Latvia due to social activity and mortality rate of females and males (Fig. 2). Respondents are mostly still working (n = 109) or retired (n = 107) (Fig. 3). Respondents had mostly vocational education (n = 96) and university degree (n = 81) (Fig. 4).

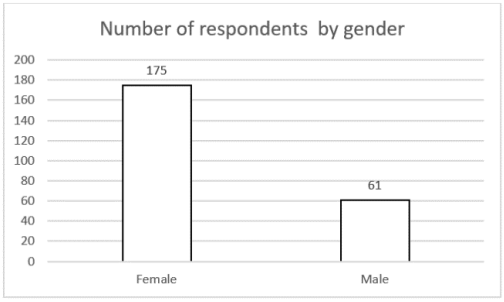

Fig. 2. Number of respondents by gender (Source: authors' compilation**)**

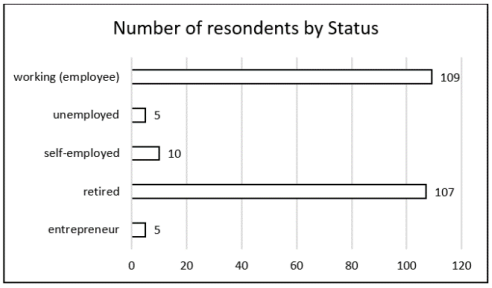

Fig. 3. Number of respondents by status (Source: authors' compilation**)**

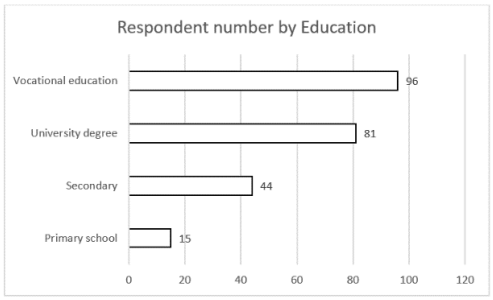

Fig. 4. Number of respondents by education (Source: authors' compilation**)**

Results

Respondents determined self-evaluation and training needs by assessing 26 statements from 1 (poor) to 4 (very good). Some findings from scale 'computer essentials' self-assessment data are below. Half of Latvian respondents evaluated skill 'to create/delete/rename a document' as poor; the same refers to the ability to print and scan files. The majority of respondents know how to turn on and off a computer (Fig. 5). These statements described basic essential computer skills, which seem self-evident for younger generations, in contrast to senior adults who labelled the mentioned skills as poor.

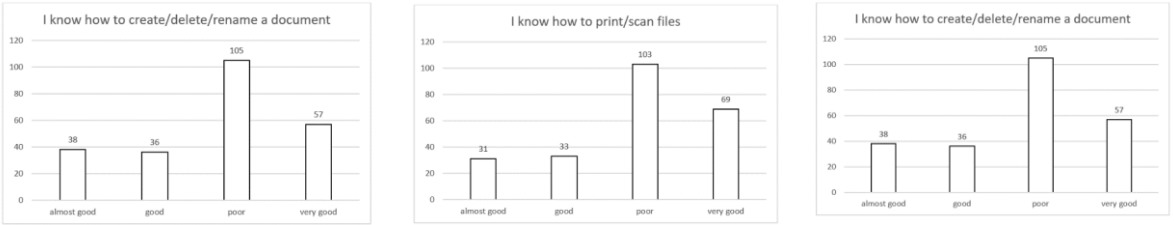

Fig. 5. Survey statements (Source: authors' compilation**)**

The data were treated with SPSS software comprising of the following steps. The first step is the reliability statistics – calculation of Cronbach's alpha coefficient. All scales are reliable as coefficient for all scales is high, $\alpha > 0.7$ (Table 1).

Table 1. Scales' reliability statistics (Source: authors' compilation)

Reliability Statistics
Scale "Computer essential"

Cronbach's Alpha	N of Items
.946	6

Reliability Statistics
Scale "Hardware

Cronbach's Alpha	N of Items
.846	5

Reliability Statistics
Scale "Communication and Collaboration"

Cronbach's Alpha	N of Items
.910	5

Reliability Statistics
Scale "Internet"

Cronbach's Alpha	N of Items
.956	8

The second step was to determine normal distribution. The authors used the analysis of Kolmogorov–Smirnov *Z* criteria significance or Sig. (Table 2); as Sig. was lower than 0.05, the data does not correspond with normal distribution and Spearman's rho coefficient was conducted (Table 3).

Table 2. One-sample Kolmogorov–Smirnov test (Source: authors' compilation)

One-Sample Kolmogorov-Smirnov Test

	Computer_essential	hardwere	internet	komuni
N	214	214	214	214
Kolmogorov-Smirnov Z	1.755	1.498	1.43	1.581
Asymp. Sig. (2-tailed)	**0.004**	**0.023**	**0.033**	**0.014**

Table 3. Spearman's rho test (Source: authors' compilation)

		Computer essential	Hardware	Internet	Communication and collaboration
Computer essential	Spearman's rho	1			
	Sig. (two-tailed)	0			
	N	214			
Hardware	Spearman's rho	0.715**	1		
	Sig. (two-tailed)	0	0		
	N	214	214		
Internet	Spearman's rho	0.770**	0.725**	1	
	Sig. (two-tailed)	0	0	0	
	N	214	214	214	
Communication and collaboration	Spearman's rho	0.711**	0.756**	0.853**	1
	Sig. (two-tailed)	0	0	0	0
	N	214	214	214	214

**Correlation is significant at the 0.01 level (two-tailed).

After conducting Spearman's rho coefficient, the conclusion is that data is not multicollinear as coefficient is less than 0.9. Third, Mann–Whitney test was performed to test differences between gender, age, status and education (Table 4).

Table 4. Test statistics (Source: authors' compilation)

	Computer essential	Hardware	Internet	Communication and collaboration
Mann–Whitney *U*	3781	4296	3648.5	3601
Wilcoxon *W*	5492	6007	5359.5	5312
Z	–1.857	–0.568	–2.18	–2.306
Asymp. Sig. (two-tailed)	0.063	0.57	0.029	0.021

There are statistically significant differences between genders (Sig. ≤ 0,05) and Internet usage and communication and collaboration scales.

Fourth, ANOVA was performed according to respondent status: 1 (entrepreneur), 2 (working), 3 (unemployed), 4 (retired), 5 (self-employed). There are statistically significant differences in all criteria between all statuses (Sig. ≤ 0.05) (Table 5).

Table 5. ANOVA status test (Source: authors' compilation)

		Sum of squares	*df*	Mean square	*F*	Sig.
Computer essential	Between groups	39.85	4	9.962	9.408	0
	Within groups	221.312	209	1.059		
	Total	261.162	213			
Hardware	Between groups	20.969	4	5.242	6.832	0
	Within groups	160.376	209	0.767		
	Total	181.345	213			
Internet	Between groups	40.311	4	10.078	12.952	0
	Within groups	162.613	209	0.778		
	Total	202.924	213			
Communication and collaboration	Between groups	34.627	4	8.657	9.099	0
	Within groups	198.848	209	0.951		
	Total	233.475	213			

As presented in table 6, there are statistically significant differences in all criteria between status 2 (working) and 5 (self-employed).

Table 6. Multiple comparisons (Source: authors' compilation)

Dependent variable	(*I*) status	(*J*) status	Mean difference (*I*–*J*)	Std. error	Sig.	95% confidence interval	
						Lower bound	Upper bound
Computer essential	1	2	0.87544	0.47215	0.346	-0.4238	2.1747

		3	0.6381	0.60254	0.827	-1.0199	2.2961
		4	1.13333	0.65082	0.411	-0.6575	2.9242
		5	0.01765	0.47134	1	-1.2794	1.3147
	2	1	-0.87544	0.47215	0.346	-2.1747	0.4238
		3	-0.23734	0.40301	0.977	-1.3463	0.8716
		4	0.25789	0.47215	0.982	-1.0413	1.5571
		5	-0.85779*	0.14672	0	-1.2615	-0.454
	3	1	-0.6381	0.60254	0.827	-2.2961	1.0199
		2	0.23734	0.40301	0.977	-0.8716	1.3463
		4	0.49524	0.60254	0.924	-1.1628	2.1533
		5	-0.62045	0.40206	0.536	-1.7268	0.4859
	4	1	-1.13333	0.65082	0.411	-2.9242	0.6575
		2	-0.25789	0.47215	0.982	-1.5571	1.0413
		3	-0.49524	0.60254	0.924	-2.1533	1.1628
		5	-1.11569	0.47134	0.129	-2.4127	0.1813
	5	1	-0.01765	0.47134	1	-1.3147	1.2794
		2	0.85779*	0.14672	0	0.454	1.2615
		3	0.62045	0.40206	0.536	-0.4859	1.7268
		4	1.11569	0.47134	0.129	-0.1813	2.4127
Hardware	1	2	0.98526	0.40193	0.106	-0.1207	2.0913
		3	0.71429	0.51292	0.633	-0.6971	2.1257
		4	1.28	0.55402	0.146	-0.2445	2.8045
		5	0.4	0.40124	0.857	-0.7041	1.5041
	2	1	-0.98526	0.40193	0.106	-2.0913	0.1207
		3	-0.27098	0.34307	0.933	-1.215	0.6731
		4	0.29474	0.40193	0.949	-0.8113	1.4007
		5	-0.58526*	0.1249	0	-0.929	-0.2416
	3	1	-0.71429	0.51292	0.633	-2.1257	0.6971
		2	0.27098	0.34307	0.933	-0.6731	1.215
		4	0.56571	0.51292	0.805	-0.8457	1.9771
		5	-0.31429	0.34226	0.89	-1.2561	0.6275
	4	1	-1.28	0.55402	0.146	-2.8045	0.2445
		2	-0.29474	0.40193	0.949	-1.4007	0.8113
		3	-0.56571	0.51292	0.805	-1.9771	0.8457
		5	-0.88	0.40124	0.186	-1.9841	0.2241
	5	1	-0.4	0.40124	0.857	-1.5041	0.7041
		2	0.58526*	0.1249	0	0.2416	0.929
		3	0.31429	0.34226	0.89	-0.6275	1.2561
		4	0.88	0.40124	0.186	-0.2241	1.9841
Internet	1	2	0.92947	0.40472	0.15	-0.1842	2.0432
		3	0.95429	0.51649	0.349	-0.467	2.3755
		4	1.14	0.55787	0.249	-0.3951	2.6751
		5	0.07922	0.40403	1	-1.0326	1.191
	2	1	-0.92947	0.40472	0.15	-2.0432	0.1842
		3	0.02481	0.34546	1	-0.9258	0.9754
		4	0.21053	0.40472	0.985	-0.9032	1.3242

		5	-0.85026*	0.12577	0	-1.1963	-0.5042
	3	1	-0.95429	0.51649	0.349	-2.3755	0.467
		2	-0.02481	0.34546	1	-0.9754	0.9258
		4	0.18571	0.51649	0.996	-1.2355	1.607
		5	-0.87507	0.34464	0.086	-1.8234	0.0733
	4	1	-1.14	0.55787	0.249	-2.6751	0.3951
		2	-0.21053	0.40472	0.985	-1.3242	0.9032
		3	-0.18571	0.51649	0.996	-1.607	1.2355
		5	-1.06078	0.40403	0.069	-2.1726	0.051
	5	1	-0.07922	0.40403	1	-1.191	1.0326
		2	0.85026*	0.12577	0	0.5042	1.1963
		3	0.87507	0.34464	0.086	-0.0733	1.8234
		4	1.06078	0.40403	0.069	-0.051	2.1726
Communication and collaboration	1	2	0.95158	0.44755	0.213	-0.28	2.1831
		3	0.93143	0.57114	0.479	-0.6402	2.5031
		4	1.24	0.6169	0.265	-0.4576	2.9376
		5	0.17373	0.44678	0.995	-1.0557	1.4032
	2	1	-0.95158	0.44755	0.213	-2.1831	0.28
		3	-0.02015	0.38201	1	-1.0713	1.031
		4	0.28842	0.44755	0.968	-0.9431	1.52
		5	-0.77785*	0.13908	0	-1.1606	-0.3951
	3	1	-0.93143	0.57114	0.479	-2.5031	0.6402
		2	0.02015	0.38201	1	-1.031	1.0713
		4	0.30857	0.57114	0.983	-1.2631	1.8802
		5	-0.7577	0.38111	0.275	-1.8064	0.291
	4	1	-1.24	0.6169	0.265	-2.9376	0.4576
		2	-0.28842	0.44755	0.968	-1.52	0.9431
		3	-0.30857	0.57114	0.983	-1.8802	1.2631
		5	-1.06627	0.44678	0.123	-2.2957	0.1632
	5	1	-0.17373	0.44678	0.995	-1.4032	1.0557
		2	0.77785*	0.13908	0	0.3951	1.1606
		3	0.7577	0.38111	0.275	-0.291	1.8064
		4	1.06627	0.44678	0.123	-0.1632	2.2957
*The mean difference is significant at the 0.05 level.							

ANOVA was performed according to respondent age (Table 7). There are statistically significant differences in all criteria between age groups (Sig. ≤ 0.05) (Table 8). The age groups are 1 (55–59), 2 (60–65), 3 (66–70), 4 (71–75) and 5 (75 and older).

Table 7. ANOVA testing (Source: authors' compilation)

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Computer_essential	Between Groups	23.784	4	5.946	5.235	0
	Within Groups	237.378	209	1.136		
	Total	261.162	213			
Hardware	Between Groups	19.49	4	4.872	6.292	0
	Within Groups	161.856	209	0.774		
	Total	181.345	213			
Internet	Between Groups	23.981	4	5.995	7.002	0
	Within Groups	178.943	209	0.856		
	Total	202.924	213			
Communication & Collaboration	Between Groups	31.865	4	7.966	8.258	0
	Within Groups	201.61	209	0.965		
	Total	233.475	213			

Table 8. Multiple comparisons (Source: authors' compilation)

						95% confidence interval	
		(*J*) age	Mean difference (*I*–*J*)	Std. error	Sig.	Lower bound	Upper bound
Dependent variable	(*I*) age	4	0.69176*	0.23646	0.031	0.0411	1.3424
		5	0.94487*	0.25442	0.002	0.2448	1.645
		4	0.64796	0.25247	0.08	-0.0468	1.3427
		5	0.90106*	0.26937	0.009	0.1598	1.6423
		3	0.48351*	0.1727	0.044	0.0083	0.9587
		4	0.69208*	0.19525	0.004	0.1548	1.2294
		5	0.79612*	0.21009	0.002	0.218	1.3742
		5	0.67240*	0.22243	0.023	0.0603	1.2845
	4	1	-0.69208*	0.19525	0.004	-1.2294	-0.1548
		3	0.56264*	0.18159	0.019	0.0629	1.0623
		4	0.81014*	0.2053	0.001	0.2452	1.3751
		5	0.92644*	0.2209	0	0.3186	1.5343

Table 8 shows that there are statistically significant differences between education groups.
ANOVA was performed according to respondent education (Table 9). There are statistically significant differences in all criteria between education groups (Sig. ≤ 0.05) with education groups being 1 (primary), 2 (secondary), 3 (university degree) and 4 (vocational education). These results coincide with studies carried out in 2016, which show that age, gender and education are significant factors when analysing the use of online social networks by older active Internet users (Román-García et al., 2016; Vošner et al., 2016).

Table 9. ANOVA testing (Source: authors' compilation)

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Computer_essential	Between Groups	52.985	3	17.662	17.816	0
	Within Groups	208.176	210	0.991		
	Total	261.162	213			
Hardware	Between Groups	13.745	3	4.582	5.741	0.001
	Within Groups	167.6	210	0.798		
	Total	181.345	213			
internet	Between Groups	30.726	3	10.242	12.49	0
	Within Groups	172.198	210	0.82		
	Total	202.924	213			
Communication & Collaboration	Between Groups	29.075	3	9.692	9.957	0
	Within Groups	204.4	210	0.973		
	Total	233.475	213			

Latvia's data sample is reliable according to Cronbach's alpha testing results. The main research question, what are the training needs of senior citizens in Latvia, was addressed. Results proved that in Latvia senior citizens are willing to learn digital skills. Based on ANOVA performed according to respondent education, age and occupational status, the overwhelming conclusion is that there are statistically significant differences in all criteria between education, age and occupational status of respondents. This leads to the main conclusion presented next.

Conclusions

The main conclusions developed for adult educators in the field of digital skills are as follows: (1) organize training groups of senior adults by selecting the adult learners by age group and education; (2) organize training groups of senior adults by selecting the adult learners by occupational status as well. Latvia's results showed that there is statistically significant difference between two groups – group 2 (working senior adults) and group 5 (self-employed senior adults) – that could be explained by different daily usage of skills. (3) Organize training programme focusing on very simple activities to be taught, for example, opening word document, renaming document, deleting file, printing file, scanning file. The results reveal that there is a significant lack of knowledge about basic essential digital skills among Latvia's seniors reached out during this survey.

Future research may focus on country profile comparison based on collected data in four partner countries, the total reach being 1003 respondents (Latvia 236, Portugal 327, Turkey 259, Cyprus 181).

Acknowledgements

Support for this work was provided by project 'Digital Acquisition through Intergenerational Learning' (DIAL No. 2017-1-LV01-KA204-035455) funded by Erasmus Plus programme and international team

of project partnership from Portugal (The Association of Third Age Universities Network – RUTIS), Turkey (S&G – System and Generation Association), Cyprus (the 'Emphasys Centre').

Publicity Disclaimer
This publication reflects the views of the author. The managing authority of the programme is not liable for how this information may be used.

References

Adult education and training in Europe – widening access to learning opportunities (2015). EU publication. [Accessed 15.03.2019]. Available on Internet: https://publications.europa.eu/en/publication-detail/-/publication/aaeac7ed-7bad-11e5-9fae-01aa75ed71a1/language-en

Anabel Quan-Haase, Guang Ying Mo & Barry Wellman (2017). Connected seniors: how older adults in East York exchange social support online and offline, Information, Communication & Society, 20:7, 967-983, DOI: 10.1080/1369118X.2017.1305428

Digital Competence Reference Framework of the EC (2016). EU publication. [Accessed 15.03.2019]. Available on Internet: https://ec.europa.eu/jrc/en/digcomp/digital-competence-framework

EUROPE 2020 A strategy for smart, sustainable and inclusive growth (2010). [Accessed 18.03.2019]. Available on Internet: http://ec.europa.eu/eu2020/pdf/COMPLET%20EN%20BARROSO%20%20%20007%20-%20Europe%202020%20-%20EN%20version.pdf

Heaggans, R. C. (2012). The 60's Are the New 20's: Teaching Older Adults Technology. *SRATE Journal*, *21*(2), 1-8.

Jacobson, Jenna, Lin, Chang, & McEwen, Rhonda. (2017). Aging with technology: Seniors and mobile connections. Canadian Journal of Communication, 42(2), 331–357.

Nimrod, G. (2016). Older audiences in the digital media environment. Information, Communication & Society, 1-17. doi: http://dx.doi.org/10.1080/1369118X.2016.1164740

Orlov, Laurie M. (2016). 2016 technology survey: Older adults, age 59-85+. Mason, OH: Aging in Place Technology Watch. Available on Internet: https://www.ageinplacetech.com/files/aip/Linkage%202016%20Technology%20April%202016.pdf [Accessed 27.09.2019].

Project DIAL (2019). *Project.* [Accessed 20.03.2019]. Available on Internet: https://dialproject.eu/project/background/

Project DIAL Survey (2019). Survey. [Accessed 18.03.2019]. Available on Internet: http://survey.dialproject.net/

Román-García, S., & Almansa-Martínez, A. (2016). Adultos y mayores frente a las TIC. La competencia mediática de los inmigrantes digitales. *Comunicar*, *24*(49), 101-109.

Schreurs, K., Quan-Haase, A., & Martin, K. (2017). Problematizing the digital literacy paradox in the context of older adults' ICT use: Aging, media discourse, and self-determination. *Canadian Journal of Communication*, *42*(2).

Seifert, A., & Schelling, H. R. (2018). Seniors online: Attitudes toward the internet and coping with everyday life. *Journal of Applied Gerontology*, *37*(1), 99-109.

Vošner, H. B., Bobek, S., Kokol, P., & Krečič, M.J. (2016). Attitudes of Active Older Internet Users towards Online Social Networking. Computers in Human Behavior, 55, 230-241. (http:// - goo.gl/jiOmI6) (2016-06-03).