Understanding Young Graduates' Life/Career Satisfaction levels and their Subjective Future Expectations, through their internet skills, in Central Europe

Barbara Tóth[1] and Zsombor Zrubka[1, 2]

[1]Doctoral School of Innovation Management, Obuda University, Bécsi út 96/b, 1034 Budapest, Hungary, toth.barbara@uni-obuda.hu

[2]HECON Health Economics Research Center, University Research, and Innovation Center, Obuda University, Bécsi út 96/b, 1034 Budapest, Hungary zrubka.zsombor@uni-obuda.hu

Abstract: Today, communication and administration are increasingly moving online and this trend is also evident in the health sector. Together with internet-based solutions, designed to make healthcare logistics more efficient, AI-based therapeutic solutions are emerging, while patients and informal caregivers are exposed to vast amounts of online information. In such times, internet skills are becoming increasingly important. This study explores university graduate young adults' current and expected future satisfaction with life and career, and their associations with internet skills. An online survey was conducted in Czech Republic, Hungary, Poland and the Slovak Republic, among <31-year-old adults, with a university degree. Life satisfaction (LS), career satisfaction (CS), expected LS (eLS) and expected CS (eCS) in 10 years, were assessed with numeric scales. To measure internet skills, Operational, Information Navigation, Social, and Creative domains of the Internet Skills Scale (ISS), were applied. Partial Least Squares Structural Equation Models were built for the four satisfaction outcomes. Different associations were observed between dimensions of ISS and satisfaction variables. Positive but weak associations were found between LS and ISS-Social; CS and ISS-Operational and -Creative; eLS and ISS-Social and -Creative; eCS and ISS-Operational, -Social and -Information navigation skills. The R2 values of the four models ranged between 0.108 and 0.163. Positive expectations for improvement in life and career satisfaction were common. The significant, but weak, effect magnitudes suggest that internet skills play a minor role in both current and expected life and career satisfaction of young graduates, nevertheless, underscoring the need for innovative strategies to enhance these competencies.

Keywords: life satisfaction; career satisfaction; future expectation; internet skill; innovative healthcare

1   Introduction

In the era of the digital revolution, digital devices and the internet have become an inevitable part of life. The vast amount of information available on the internet opens opportunities to learn new hobbies, professions, and find answers to practical questions, while they change the behavior of individuals [1]. Unchecked, or false information can be hazardous, especially when it comes to health-related information on the internet [2]. In today's healthcare there are an increasing number of tools that utilize internet-based digital technology [2] [3]. In societies with aging populations and improving life expectancy, more elderly and chronically ill individuals are turning to healthcare institutions, pushing the system toward the patient activation model, where patients actively engage in their health maintenance and improvement partly by sifting through vast online information, and navigating numerous websites [4] [5]. Seniors and those with lower education levels often struggle with basic digital skills, making adaptation difficult. However, the challenge extends to younger generations. University-aged youth will utilize these advances in the future, and currently, they frequently serve as informal caregivers for their elders. Surprisingly, research shows that even university students, who are accustomed to the digital world, may lack essential digital competencies [6]. Recognizing these gaps is crucial for developing innovative practices to improve the digital skills of both elders and the young.[7] Given the multifaceted activities over the internet, digital skills involve multiple dimensions, such as operational, informational, social, and creative skills [8]. Given the simultaneous advantages and perils of the online world, numerous studies have examined the relationship between digital skills and wellbeing.

These studies emphasize that better digital skills create more opportunities for learning [9], career advancement, entertainment [10], and social interaction [11] and successful management of one's health [12], all of which positively impact life satisfaction. This connection became more pronounced after the COVID-19 pandemic [13]. Within the context of the association between satisfaction and internet skills, both the current experiences and future expectations for satisfaction raise intriguing questions [14].

Digital skills enable workplace success, higher wages, and greater job satisfaction [15]. Digital skills are an important part of the electronic health literacy patients' need to effectively navigate today's healthcare systems [16] [17].

The digital space has become a key venue for interpersonal interactions, with new social norms [18]. While using the internet for communication was associated with lower levels of depression, its usage for other purposes was linked to higher levels of depression and social anxiety [19].

Employment-related experiences are crucial for young adults, particularly during the transition from university to work, while education and student needs have

significantly evolved due to digitalization [20-22]. Accordingly, career satisfaction (CS) may contribute to the satisfaction of this age group.

The aim of the study was to investigate graduated young adults' current life and career satisfaction and their respective subjective expectations for 10 years from now in a four-country study in the Central and Eastern European region. We use partial least squares structural equation modelling (PLS-SEM) to explore the association between satisfaction and the different domains (operational, informational, social, and creative) of Internet Skills Scale, when controlled for sociodemographic variables and respondents' relevant activities during their university student years.

2 Methods

2.1 Data Collection

The survey was conducted between July and August 2022 as part of a larger study. Data collection was performed by a professional survey company by purposive sampling from national online panels, based on the following inclusion criteria. The target sample size was 500 for Czech Republic, Hungary and Poland, and 300 for Slovak Republic. Participants were young adults aged < 31 years with at least one university diploma, with their first diploma obtained in any of the four countries. The data collection was anonymous and respondents provided their informed consent prior to participation.

2.2 Survey Tools

A survey was developed by the research group that comprised standard questionnaires. The questionnaire consisted of eight modules: demographic, current life situation, qualification, employment/study status, experiences during obtaining the first degree, skills and future expectation modules.

2.2.1 Demographic Variables

We recorded the respondents' gender (male, female, other), age, nationality, the level of highest completed degree (bachelor, masters, doctoral), employment/study status, relative income (much better than average, slightly better than average, roughly average, slightly worse than average, much worse than average, I can't/ I don't want to answer), degree of urbanization of their place of residence (city, town/suburb, rural area), as well as the educational level of their parents.

2.2.2   Life and Career Satisfaction and Subjective Future Expectations

Life satisfaction (LS) was examined using a single-item measurement tool called "Single Item Satisfaction with Life Scale" [23]. Respondents were asked to indicate their current level of LS on a 11-point numeric scale, where 0 represented complete dissatisfaction, and 10 indicated complete satisfaction with life. Additionally, respondents rated their career satisfaction (CS) on a 5-point Likert scale, where 1 stands for "very dissatisfied" and 5 denotes "very satisfied".

For the assessment of self-reported future expectations, we applied these same measures, placing the questions within a 10-year timeframe. Future expectations concerning LS and CS were denoted as eLS and eCS, respectively.

2.2.3   Measuring Student Activity

We denoted self-reported extracurricular activities during the respondents' university student years as the Student Activity Indicator (SAI). The SAI list was compiled by the research team, which comprised senior academic researchers from the participating countries. The binary items included taking one or more courses in a foreign language; completion of a degree in a foreign language; spending at least one semester at a foreign university; participation in research or development work; participation in student scientific competition; presentation of conference poster; having scientific publication; receiving research, study, or art grant; participation in creative or art project; having art exhibition; and participation in social or public activities.

In this study, SAI referred to activities during obtaining the first degree. We used SAI as a proxy for general student skills.

2.2.4   Internet Skills Scale (ISS)

Internet skills were measured using the ISS developed and validated in 2016 [8]. ISS aims to examine self-reported digital skills beyond their technical dimensions.

The domains of ISS include Operational, Information Navigation, Social, and Creative skills. Operational skills cover basic skills for using the internet, such as opening websites, downloading files, using shortcut keys. Information navigation skills measure skills to successfully navigate between information available on the internet, e.g., finding and interpreting necessary web pages, ability to search for the correct keywords. Social skills are related to skills needed to connect with others, to share information, creative skills are related to skills needed to create new content from existing content [24]. The Mobile domain was omitted from this study due to its strong overlap with the Creative and Operational domains [8]. In this study, we applied the short version of the ISS (hereinafter referred as ISS), in which each domain consists of five questions rated on a 5-point Likert scale.

Respondents could achieve a minimum of 5 and a maximum of 25 points within each domain, where higher scores represent better skills.

Validated local language versions of the ISS were not available in the participating countries. Therefore, the original English version of the ISS instrument was translated into Czech, Hungarian, Polish, and Slovak by local experts using forward and backward translation methods. The detailed validation of the Hungarian version of ISS, including confirmatory factor analysis (CFA), Cronbach's alpha, and test-retest reliability, is provided in a separate, recently published paper. The results from that study supported the four-factor model, with CFA results showing good fit. Cronbach's alpha values for the subscales ranged from 0.79 to 0.95, demonstrating good internal consistency. However, the ICC for the four ISS dimensions ranged from 0.15 to 0.78, indicating poor test-retest reliability for three of the four dimensions probably due to homogenous sample.[17]

2.3 Data Analysis

2.3.1 Data Preparation and Definition of "Career Subsample"

While LS and eLS were assessed on the total sample, we evaluated CS and eCS only on the subsample of employed respondents ("career subsample"). Respondents who selected any of the following options regarding their employment/study status were excluded from the career subsample: "I study, I don't work"; "I am unemployed, looking for work"; "I am unemployed, not looking for work"; "I am raising a child and receiving child support"; "Homemaker".

To accommodate the PLS SEM model, continuous variables were entered directly, ordinal, and multinomial variables were recoded to binary categories.

When accounting for nationality in the model, Czech was chosen as the base category, and Hungarian, Polish, and Slovak were transformed into binary dummy variables.

To address the presence of the "other" gender option in the questionnaire, understanding its negligible effect on the results, those choosing "other" were arbitrarily categorized as female, for this study.

The variables recorded, the binary categories entered the PLS SEM models, and the details of the sample and the "career subsample" are shown in Table 1.

2.3.2   Descriptive Statistics

Demographic variables were tabulated both by their originally recorded and recoded binary categories. We provided mean and standard deviation (SD) for continuous variables. Additionally, the sample characteristics regarding the main variables (ISS domains and satisfaction scales) were summarized by the nationality of respondents. Differences between nationalities were examined through Analysis of Variance (ANOVA), and when significant differences were observed, a Sidak correction was employed to identify between-country differences.

2.3.3   Partial Least Squares Structural Equation Modelling (PLS SEM)

Using the same structure, we constructed four models using each satisfaction variable (LS, eLS, CS, eSC) separately as the dependent variable.

In the measurement part of the model, the single satisfaction and demographic variables were entered directly. SAI was entered as a formative construct from its binary component items. The four domains of ISS were entered as reflective constructs. In the structural part, we explored the correlation matrix of the latent variables of the model. The effect sizes of path coefficients (i.e., standardized betas) were interpreted as small between 0.1-0.3, as moderate between 0.3-0.5, and as large above 0.5 [25]. The adequacy of our measurement and structural models was examined in accordance with the guidelines outlined in the 2018 article by Hair et al. [26]. We examined model performance by R^2 for the dependent variable and average R^2 for the structural model. We tested whether the association of satisfaction differs between the four domains of ISS by pairwise comparison of the differences between path coefficients via bootstrap, using 5000 iterations. We compared the association pattern of the four ISS domains across the four models informally.

3   Results

3.1   Survey Composition and Demographics

The questionnaire was completed by a total of 1877 respondents, including 491 Czech, 535 Hungarian, 535 Polish, and 316 Slovak participants. The career subsample (employed individuals) involved 1495 (79.6%) respondents. In the total sample, the average age of the respondents was 27 (SD=2.7) years, 61.9% were female, and 0.16% (N=3) indicated other gender, who were merged with females

in the analysis. The demographic variables were summarized separately for the total sample and the career subsample.

In the total sample, the average score for LS was 6.7 (SD=2.3), which is lower than that of eLS (p<0.001), with an average of 7.7 (SD=1.8). The average score for the five-point CS was 3.1 (SD=0.9), while eCS had an average score of 3.6 (SD=0.8) (p<0.001).

The average score of Operational skills was 23.1 (SD=3.8), and that of Information Navigation was 19.5 (SD=5.4), of Social skills was 22.3 (SD=3.8), and of Creative skills was 17.9 (SD=4.9). For Operational skills 67% respondents, and for Social skills 45% provided the maximum score.

Table 1
Demographic variables

Sociodemographic variables		Categories entered in the model	Total sample		Career subsample*	
			N	%	N	%
Total sample			1877	100.0	1495	100.0
Nationality		Czech	491	26.2	360	24.1
		Hungarian	535	28.5	429	28.7
		Polish	535	28.5	478	32.0
		Slovak	316	16.8	228	15.3
Gender	Male	Male	712	37.9	616	41.2
	Female	Female	1162	61.9	876	58.6
	Other		3	0.2	3	0.2
Age	1 - 25 years	Scale variable	586	31.2	420	28.1
	25 - 28 years		656	35.0	565	37.8
	28 - 31 years		635	33.8	510	34.1
Degree of urbanization	City	Lives in a city	1028	45.2	883	45.2
	Town/ suburb	Does not live in the city	849	54.8	612	54.8
	Rural areas					
Employment/ study status		I work full time without studying	1104	58.82	1104	73.85
		I work part-time, but I don't study	98	5.22	98	6.56
		I work full time and study	144	7.67	144	9.63
		I work part-time and study	149	7.94	149	9.97
		I study, I don't work	128	6.82	-	-

B. Tóth *et al.*

Understanding Young Graduates' Life/Career Satisfaction levels and
their Subjective Future Expectations, through their internet skills, in Central Europe

		I am unemployed, looking for work	80	4.26	-	-
		I am unemployed, not looking for work	11	0.59	-	-
		I am raising a child and receiving child support	149	7.94	-	-
		Homemaker	14	0.75	-	-
Relative income	Much better than average	Better than average	676	36.0	582	38.9
	Slightly better than average					
	Roughly average	Average or worse than average	1201	64.0	913	61.1
	Slightly worse than average					
	Much worse than average					
Mother's education	Primary school	Does not have a college degree	1157	61.6	906	60.6
	Vocational training,					
	High school diploma					
	College, university	Has a degree	720	38.4	589	39.4
Father's education	Primary school	Does not have a college degree	1228	65.4	966	64.6
	Vocational training,					
	High school diploma					
	College, university	Has a degree	649	34.6	529	35.4
Respondent's education	College, university	Has a degree	1242	66.2	966	64.6
	MSc degree	Has more than one degree	635	33.8	529	35.4
	PhD degree					

*Respondents employed at the time of the survey.

3.1.1 Satisfaction and ISS Scores by Countries

The four satisfaction variables and self-reported internet skills by ISS domains are summarized by country in Table 2. In the comparison between countries, Hungarian and Polish respondents scored less than Czech and Slovak respondents on the life satisfaction scale, Polish respondents were slightly less satisfied with their careers than other respondents. Social internet skills of Slovak and Polish respondents differed significantly while the creative skills of Hungarian respondents were significantly higher than other respondents.

Table 2

Main variables by countries

	Czech		Hungarian		Polish		Slovak		ANOVA
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	p-value
LS (range 0-10)	6.94	2.14	6.48	2.29	6.36	2.33	7.13	2.14	< 0.001[b]
eLS (range 0-10)	7.85	1.72	7.61	1.85	7.63	1.82	7.79	1.83	0.096
CS (range 1-5)[a]	3.23	0.98	3.19	0.93	2.91	0.96	3.29	1.02	< 0.001[c]
eCS (range 1-5)[a]	3.62	0.88	3.66	0.84	3.52	0.84	3.64	0.83	0.082
ISS Operational skill (range 5-25)	23.09	4.15	23.09	4.00	22.84	3.63	23.58	3.33	0.059
ISS Information Navigation skill (range 5-25)	19.32	5.21	19.42	5.29	19.32	5.21	19.67	5.12	0.545
ISS Social skill (range 5-25)	22.11	3.93	22.41	3.85	21.93	3.73	22.73	3.57	0.015[d]
ISS Creative skill (range 5-25)	17.85	4.80	18.93	4.99	17.00	4.99	17.60	4.58	<0.001[e]

[a] measured on the career sample (N=1495); [b] Sidak: Czech vs. Hungarian p=0.006, Czech vs. Polish p<0.001, Hungarian vs. Slovak p<0.001, Polish vs. Czech p<0.001, Polish vs. Slovak p<0.001; [c] Sidak: Polish vs. Czech p<0.001, Hungarian vs Polish p< 0.001, Polish vs Slovak p < 0.001 [d] Sidak: Polish vs. Slovak p= 0.019; [e]Sidak: Czech vs. Hungarian p= 0.002, Czech vs. Polish p=0.034, Hungarian vs. Slovak p=0.001, Polish vs. Czech p=0.034

3.2 PLS-SEM Analysis

In all four models the correlation between Operational and Social skills was moderate or strong. The correlations between other latent variables were weak or negligible. The model coefficients and p values are shown in Table 3.

Table 3

Path coefficients and significance of structural model of PLS SEM models

	LS		eLS		CS		eCS	
Variable	β	p-value	β	p-value	β	p-value	β	p-value
SAI	**0.090**	0.000	**0.104**	0.000	**0.090**	0.000	**0.092**	0.000
EDUC	-0.016	0.479	0.006	0.796	0.015	0.553	0.015	0.543
AGE	-0.031	0.179	**-0.093**	0.000	0.012	0.632	**-0.109**	0.000

SEX	**0.051**	0.031	**0.059**	0.013	**-0.073**	0.005	0.009	0.737
CITY	-0.024	0.288	**-0.048**	0.035	-0.018	0.467	-0.008	0.757
FEDUC	0.001	0.959	0.026	0.295	-0.011	0.691	0.018	0.512
MEDUC	**0.069**	0.005	0.048	0.054	**0.096**	0.000	0.046	0.089
RELINC	**0.255**	0.000	**0.209**	0.000	**0.257**	0.000	**0.162**	0.000
HU	**-0.118**	0.000	**-0.066**	0.017	-0.054	0.084	0.007	0.816
PL	**-0.082**	0.003	-0.007	0.792	**-0.098**	0.002	-0.007	0.817
SL	0.044	0.081	-0.001	0.981	0.026	0.358	0.008	0.780
ISS_O	**-0.112**	0.000	-0.002	0.961	**0.073**	0.036	**0.200**	0.000
ISS_IN	-0.039	0.104	0.008	0.741	-0.021	0.435	**0.069**	0.009
ISS_S	**0.119**	0.000	**0.150**	0.000	0.025	0.486	**0.112**	0.003
ISS_C	0.028	0.253	**0.056**	0.024	**0.061**	0.027	0.046	0.099
r2_a	0.123		0.108		0.147		0.163	

β: standardized path coefficient

* SAI measurement structure: cfl - taking one or more courses in a foreign language; dfl- completion of a degree in a foreign language; sfu- spending at least one semester at a foreign university; rdp - participation in research or development work; ssc- participation in student scientific competition; con- presentation of conference poster; pub- having scientific publication; rgr- receiving research, study or art grant; crp - participation in creative or art project; exh - having art exhibition; soc - participation in social or public activities. ISS_O – Operational skills, ISS_IN: Information Navigation skills; ISS_S: Social skills; ISS_C – Creative skills.

3.2.1   The Association between Life Satisfaction (LS) and Internet Skills

Operational skills displayed a significant negative association with LS ($p<0.001$), while the association with Social skills was positive ($p<0.001$). Information navigation ($p=0.104$) and Creative skills ($p=0.253$) were not associated with LS.

The results of the bootstrap showed that coefficients of Operational skills differed significantly from Social ($p<0.032$) and Creative skills ($p=0.003$). Also, the effects of Information Navigation skills significantly differed from both Social ($p= 0.046$) and Creative skills ($p=0.047$).

The explanatory power of the model was weak, capturing only 12.3% of the variance of LS values. The average R^2 suggested that the latent constructs collectively accounted for approximately 13% of the variance in observed indicators.

3.2.2   Associations for Expected Life Satisfaction (eLS) and Internet Skills

The eLS showed a significant association with two factors: Social ($p<0.001$), and Creative skills ($p=0.024$). Operational and Information Navigation skills were not related to eLS. The differences were significant between Social and Information Navigation skills ($p=0.008$), and between Operational and Social skills ($p=0.023$). The model explained 10.8% of the variance of eLS within the sample. The average R^2 value was 11.54%.

3.2.3   Associations for Career Satisfaction (CS) and Internet Skills

Operational (p=0.036) and creative skills (p=0.027) exhibited a significant positive association with CS. Information navigation and social skills were not associated with CS. The coefficients of different skills were not significantly different from each other.

With 14.7% of the variance explained, the CS model's explanatory power was slightly greater than that of the LS model. The average R^2 was 15.5%.

3.2.4   Associations for Expected Career Satisfaction (eCS) and Internet Skills

The eCS exhibited a significant positive relationship with three ISS domains: Operational (p<0.001), Information Navigation (p=0.009), and Social skills (p=0.003). However, it did not show a significant relationship with Creative skills. The coefficient of Operational skills was significantly different from Information navigation skills (p<0.021), and Creative skills (p<0.003).

The eCS model had the greatest explanatory power on the dependent variable (R^2=16.3%), with an average R^2=17.2%.

3.3   Discussion

Examining the associations between internet skills and satisfaction among young graduates revealed that, while internet skills were generally high in the examined population, different dimensions of internet skills had different associations with satisfaction variables. However, in general, respondents expect an increase in both their life satisfaction and career satisfaction within 10 years in all four countries.

We found that self-reported operational internet skills were negatively correlated with current life satisfaction. This may be explained by internet usage habits. Several studies argue that internet usage contributes to the development of skills required in a specific area, making young individuals, who are frequent internet users, more confident in their skills [27-29]. Students with high operational but low social skills may be particularly vulnerable to low LS and should receive attention, education, training and career development programs should place a stronger emphasis on developing both sets of skills. Specifically, programs should not only aim to enhance technical or operational internet skills but also provide targeted interventions to improve social and emotional competencies in digital spaces [30]. In these programs social media might be a tool for education [31].

At the same time, Operational internet skills had the strongest positive association with eCS reflecting several determinants of career satisfaction, such as achievements (e.g., salary increases or promotions) [32], relative income, and

work-life balance [33] are related to internet skills. Higher internet skills are associated with higher income [34], faster advancement, and better positions [15].

While work-related factors are important components of LS, LS is influenced by many additional factors, such as one's health [16] or the quality of personal relationships [35], which were not investigated in our study. Hence, the explanatory power of our models was smaller for LS and eLS than for CS or eCS.

The positive correlation between social internet skills and LS may be explained by the significance of personal relationships in shaping life satisfaction [14].

The strength of this study is that we explored the relationship between internet skills and satisfaction on a large sample that is homogeneous in terms of age and education, both of which are determinants of internet skills and satisfaction. At the same time, this population is in a pivotal transition period both in their social and career lives.

Some limitations of our research must be noted. While online presence is usual among young adults, our sample was recruited from commercial online panels, so it cannot be considered as a probabilistic sample of young adults with tertiary education.

Conclusions

Our findings suggest that, among young graduates, where internet usage is assumed to be prevalent, respondents exhibit high levels of internet skills. However, these skills vary across different dimensions of internet skills. Contrary to expectations, the correlation between higher internet skills and increased satisfaction scores is not consistent. Particularly intriguing is the fact that the correlated domains, Social and Operational skills, have opposing significant relationships with life satisfaction. This underscores the importance of treating internet skills as a subset of skills rather than a singular scale.

Acknowledgements

References

[1]   É. Pintér *et al.*, "How do Digitalization and the Fintech Phenomenon Affect Financial Decision-Making in the Younger Generation?," *ACTA POLYTECH HUNG*, Vol. 18, No. 11, pp. 191-208, 2021, doi: 10.12700/APH.18.11.2021.11.11

[2]   V. Zah, A. Burrell, C. Asche, and Z. Zrubka, "Paying for Digital Health Interventions – What Evidence is Needed?," *ACTA POLYTECH HUNG*, Vol. 19, No. 9, pp. 179-199, 2022, doi: 10.12700/APH.19.9.2022.9.10

[3]   A. Burrell, V. Zah, Z. Zrubka, and C. Asche, "PD45 Paying For Digital Health: What Evidence Is Needed?," *Int J Technol Assess Health Care*, Vol. 38, No. S1, pp. S106-S107, Dec. 2022, doi: 10.1017/S026646232200304X

[4]   Z. Zrubka *et al.*, "PNS251 Psychometric Properties of the Hungarian Language Version of the 13-ITEM Patient Activation Measure (PAM-13) in an Online Sample of the Adult General Population," *Value in Health*, Vol. 23, p. S683, Dec. 2020, doi: 10.1016/j.jval.2020.08.1695

[5]   A. Popovics, "Characteristics of Consumer Segments based on Consumer Habits and Preferences from an Environmental and Social Responsibility Perspective," *ACTA POLYTECH HUNG*, Vol. 21, No. 12, pp. 133-146, 2024, doi: 10.12700/APH.21.12.2024.12.8

[6]   N. Selwyn, "The digital native – myth and reality," *Aslib Proceedings*, Vol. 61, No. 4, pp. 364-379, Jul. 2009, doi: 10.1108/00012530910973776

[7]   A. Tick and P. T. Mai, "Cyber Security Awareness and the Behaviors of Higher Education Students, using Smartphones in Vietnam," *ACTA POLYTECH HUNG*, Vol. 21, No. 12, pp. 111-131, 2024, doi: 10.12700/APH.21.12.2024.12.7

[8]   A. J. A. M. Van Deursen, E. J. Helsper, and R. Eynon, "Development and validation of the Internet Skills Scale (ISS)," *Information, Communication & Society*, Vol. 19, No. 6, pp. 804-823, Jun. 2016, doi: 10.1080/1369118X.2015.1078834

[9]   A. Tick, "An Extended TAM Model, for Evaluating eLearning Acceptance, Digital Learning and Smart Tool Usage," *ACTA POLYTECH HUNG*, Vol. 16, No. 9, pp. 213-233, 2019, doi: 10.12700/APH.16.9.2019.9.12

[10]   M. Martínez-Domínguez and I. Fierros-González, "Determinants of internet use by school-age children: The challenges for Mexico during the COVID-

19 pandemic," *Telecommunications Policy*, Vol. 46, No. 1, p. 102241, Feb. 2022, doi: 10.1016/j.telpol.2021.102241

[11]   C. I. Martínez-Alcalá, A. Rosales-Lagarde, Y. M. Pérez-Pérez, J. S. Lopez-Noguerola, M. L. Bautista-Díaz, and R. A. Agis-Juarez, "The Effects of Covid-19 on the Digital Literacy of the Elderly: Norms for Digital Inclusion," *Front. Educ.*, Vol. 6, p. 716025, Jul. 2021, doi: 10.3389/feduc.2021.716025

[12]   L. Leporatti and M. Montefiori, "Complex role of individual digital skills and eHealth policies in shaping health policy," *Socio-Economic Planning Sciences*, Vol. 93, p. 101897, Jun. 2024, doi: 10.1016/j.seps.2024.101897

[13]   B. Taskin and C. Ok, "Impact of Digital Literacy and Problematic Smartphone Use on Life Satisfaction: Comparing Pre- and Post-COVID-19 Pandemic," *EJIHPE*, Vol. 12, No. 9, pp. 1311-1322, Sep. 2022, doi: 10.3390/ejihpe12090091

[14]   M. Péntek *et al.*, "Subjective expectations regarding ageing: a cross-sectional online population survey in Hungary," *Eur J Health Econ*, Vol. 20, No. S1, pp. 17-30, Jun. 2019, doi: 10.1007/s10198-019-01059-w

[15]   S. Lissitsa, S. Chachashvili-Bolotin, and Y. Bokek-Cohen, "Digital skills and extrinsic rewards in late career," *Technology in Society*, Vol. 51, pp. 46-55, Nov. 2017, doi: 10.1016/j.techsoc.2017.07.006

[16]   Z. Zrubka *et al.*, "Exploring eHealth Literacy and Patient-Reported Experiences With Outpatient Care in the Hungarian General Adult Population: Cross-Sectional Study," *J Med Internet Res*, Vol. 22, No. 8, p. e19013, Aug. 2020, doi: 10.2196/19013

[17]   Z. Zrubka, O. Hajdu, F. Rencz, P. Baji, L. Gulácsi, and M. Péntek, "Psychometric properties of the Hungarian version of the eHealth Literacy Scale," *Eur J Health Econ*, Vol. 20, No. Suppl 1, Art. no. Suppl 1, Jun. 2019, doi: 10.1007/s10198-019-01062-1

[18]   Y. Bilan, H. Mishchuk, and N. Samoliuk, "Digital Skills of Civil Servants: Assessing Readiness for Successful Interaction in e-society," *ACTA POLYTECH HUNG*, Vol. 20, No. 3, pp. 155-174, 2023, doi: 10.12700/APH.20.3.2023.3.10

[19]   M. H. W. Selfhout, S. J. T. Branje, M. Delsing, T. F. M. Ter Bogt, and W. H. J. Meeus, "Different types of Internet use, depression, and social anxiety: The role of perceived friendship quality," *Journal of Adolescence*, Vol. 32, No. 4, pp. 819-833, Aug. 2009, doi: 10.1016/j.adolescence.2008.10.011

[20]   N. Khattab and S. Fenton, "What Makes Young Adults Happy? Employment and Non-work as Determinants of Life Satisfaction," *Sociology*, Vol. 43, No. 1, pp. 11-26, Feb. 2009, doi: 10.1177/0038038508099095

[21]   C. M. Szabó, O. Bartal, and B. Nagy, "The Methods and IT-Tools Used in Higher Education Assessed in the Characteristics and Attitude of Gen Z," *ACTA POLYTECH HUNG*, Vol. 18, No. 1, pp. 121-140, 2021, doi: 10.12700/APH.18.1.2021.1.8

[22]   B. Orosz, "Learner Experiences Related to Digital Education Schedules in Light of Empirical Data," *ACTA POLYTECH HUNG*, Vol. 18, No. 1, pp. 141-157, 2021, doi: 10.12700/APH.18.1.2021.1.9

[23]   F. Cheung and R. E. Lucas, "Assessing the validity of single-item life satisfaction measures: results from three large samples," *Qual Life Res*, Vol. 23, No. 10, pp. 2809-2818, Dec. 2014, doi: 10.1007/s11136-014-0726-4

[24]   G. Cormode and B. Krishnamurthy, "Key differences between Web 1.0 and Web 2.0," *FM*, Apr. 2008, doi: 10.5210/fm.v13i6.2125

[25]   *Statistical power analysis for the behavioral sciences*, 2ⁿᵈ ed. Hillsdale, N.J: L. Erlbaum Associates, 1988

[26]   J. F. Hair, J. J. Risher, M. Sarstedt, and C. M. Ringle, "When to use and how to report the results of PLS-SEM," *EBR*, Vol. 31, No. 1, pp. 2-24, Jan. 2019, doi: 10.1108/EBR-11-2018-0203

[27]   E. Ferro, N. C. Helbig, and J. R. Gil-Garcia, "The role of IT literacy in defining digital divide policy needs," *Government Information Quarterly*, Vol. 28, No. 1, pp. 3-10, Jan. 2011, doi: 10.1016/j.giq.2010.05.007

[28]   E. Hargittai, "Digital Na(t)ives? Variation in Internet Skills and Uses among Members of the 'Net Generation,'" *Sociological Inquiry*, Vol. 80, No. 1, pp. 92-113, Feb. 2010, doi: 10.1111/j.1475-682X.2009.00317.x

[29]   R. Eynon and A. Geniets, "The digital skills paradox: how do digitally excluded youth develop skills to use the internet?," *Learning, Media and Technology*, Vol. 41, No. 3, pp. 463-479, Jul. 2016, doi: 10.1080/17439884.2014.1002845

[30]   D. Taibi *et al.*, "The Role of Educational Interventions in Facing Social Media Threats: Overarching Principles of the COURAGE Project," in *Higher Education Learning Methodologies and Technologies Online*, vol. 1779, G. Fulantelli, D. Burgos, G. Casalino, M. Cimitile, G. Lo Bosco, and D. Taibi, Eds., in Communications in Computer and Information Science, Vol. 1779, Cham: Springer Nature Switzerland, 2023, pp. 315-329. doi: 10.1007/978-3-031-29800-4_25

[31]   E. Zimmermann and S. Tomczyk, "Fostering Digital Life Skills Through Social Media With Adolescents in 6 German States: Protocol for an Accessibility Study According to the RE-AIM Framework," *JMIR Res Protoc*, Vol. 13, p. e51085, Apr. 2024, doi: 10.2196/51085

[32]   A. E. Abele, T. Hagmaier, and D. Spurk, "Does Career Success Make You Happy? The Mediating Role of Multiple Subjective Success Evaluations," *J Happiness Stud*, Vol. 17, No. 4, pp. 1615-1633, Aug. 2016, doi: 10.1007/s10902-015-9662-4

[33]   I. M. Martínez-León, I. Olmedo-Cifuentes, and M. C. Ramón-Llorens, "Work, personal and cultural factors in engineers' management of their career satisfaction," *Journal of Engineering and Technology Management*, Vol. 47, pp. 22-36, Jan. 2018, doi: 10.1016/j.jengtecman.2017.12.002

[34]   E. van Laar, A. J. A. M. van Deursen, J. A. G. M. van Dijk, and J. de Haan, "Determinants of 21st-Century Skills and 21st-Century Digital Skills for Workers: A Systematic Literature Review," *SAGE Open*, Vol. 10, No. 1, p. 215824401990017, Jan. 2020, doi: 10.1177/2158244019900176

[35]   V. Amati, S. Meggiolaro, G. Rivellini, and S. Zaccarin, "Social relations and life satisfaction: the role of friends," *Genus*, Vol. 74, No. 1, p. 7, Dec. 2018, doi: 10.1186/s41118-018-0032-z

[36]   E. R. Bailey, S. C. Matz, W. Youyou, and S. S. Iyengar, "Authentic self-expression on social media is associated with greater subjective well-being," *Nat Commun*, Vol. 11, No. 1, p. 4889, Oct. 2020, doi: 10.1038/s41467-020-18539-w

[37]   L. A. Jelenchick, J. C. Eickhoff, and M. A. Moreno, "'Facebook Depression?' Social Networking Site Use and Depression in Older Adolescents," *Journal of Adolescent Health*, Vol. 52, No. 1, pp. 128-130, Jan. 2013, doi: 10.1016/j.jadohealth.2012.05.008

[38]   V. Kalmus, T. Tambaum, and L. Abuladze, "Use of digital tools, digital skills and mental well-being," 2023, pp. 235-250