Bridging the Digital Divide: Factors Influencing Student Digital Skills in Albanian Higher Education

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Abstract

Purpose: *Changes in society demand new skills, especially those related to the internet as one of the most important means of communication in contemporary society. With the rise of new advancements in technologies and information systems, there is a need to understand the digital skills required to make use of and benefit from them. In this context, educational institutions play an important role in preparing students to acquire digital skills and perform accordingly to achieve desired outcomes. Through this study we aim to explore the factors affecting student digital skills and their disparities.*

Methodology: *Eempirical data from a sample of 268 higher education students were collected and analyzed through means of structural equation modelling. The perceived digital skills assessed four main dimensions, respectively: operational skills, internet navigation skills, creative skills and social skills.*

Findings: *The findings suggest that creative skills, social skills and usage frequency are important predictors of students perceived performance. Moreover, the findings confirm that location mediates the relationship between internet navigation skills and usage frequency.*

Originality: *This study expands the understanding of digital skills and disparities among students and provides practical insights to strengthen their acquisition in higher education institutions in Albania. The findings highlight the need for focused educational interventions to close the digital divide among university students and can guide plans and policies to improve training in digital skills, guaranteeing that all students have equal access to and opportunities in the digital age.*

Keywords: *digital skills, students, structural equation modelling, Albania.*

Introduction

The usage of advanced digital technology, communication technology, and social media platforms such as Facebook, Twitter, and many more has increased dramatically over the previous decade. Globally, the use of digital technology has provided society with unprecedented access to information, necessitating the development of new skill sets to access, manage, integrate, and evaluate information. Digital skills are the knowledge and capacity to discover information requirements from digital technology sources, as well as the effective use of digital tools and equipment to integrate, access, organize, and examine digital resources and create digital content.

Global researchers, practitioners, and policymakers prioritize digital literacy development (Iordache, Mariën, & Baelden, 2017). With the growth of new technologies and information systems, it is important to master the digital skills necessary to use and benefit from them.

A broad array of definitions has been developed over time for digital skills. Some researchers approach these skills from a participatory perspective such as the definition of Jenkins (2006) framing them as cultural competencies and social skills acquired through collaboration and networking activities; to tool-oriented perspectives such as the definition of Eshet-Alkalai (2004) suggesting that these skills are 'complex, cognitive, motor, sociological, and emotional skills' (Eshet-Alkalai, 2004, p.93); to later definitions that consider a broader perspective such as that of Van Deursen, Helsper & Eynon (2014) that includes an array of operational,

internet navigation, social, creative and mobile skills altogether. This demonstrates the fragmented literature on a unique accepted definition of digital skills in the academic and researcher communities and suggests that there is high conceptual diversity since the definitions of digital skills and their dimensions are constantly being redefined with the advancement of technology.

The danger of digital exclusion is a threat to everyone who lacks the required skills to tackle digitalization in all aspects of life. According to the literature, studies conducted by prominent researchers such as van Deursen and van Dijk (2014) and Helsper and Eynon (2013) show that digital skills and competences, as well as the ability to use digital media autonomously and strategically, are becoming increasingly important in ensuring users' social participation. In this context, educational institutions play an important role in preparing students to acquire digital skills and perform accordingly to achieve desired outcomes. Students' exposure to digital technologies does not necessarily mean that they are digitally skilled. Therefore, understanding the elements impacting students' digital abilities is essential given the growing dependence on digital technologies for social, professional, and academic activities. The aim of this paper is to explore the different patterns of self-reported digital skills in the Higher Education context in Albania and investigate the role of individual-level factors that are responsible for variabilities across student populations.

The following sections are structured as follows. Section 2 discusses literature review and hypotheses development, while Section 3 explains the research methodology. Results are presented in Section 4 and discussion is presented in Section 5, whereas Section 6 discusses the conclusions of this study.

Literature Review

In the Albanian context, little scientific research has been focused into students' digital skills. Determining the true level of digital skills is highly difficult because the majority of these skills are learned by experience in specific social user contexts (Van Dijk, 2005). In extant research a number of large-scale studies have indicated considerable disparities in skills among populations, even when the target populations are in countries with higher exposure to information and communication technologies and new media channels (Van Dijk, 2005; Warschauer, 2003). While there is still debate on a single framework that conceptualizes the set of digital skills, we adopted the framework of skills developed by Van Deursen, Helsper & Eynon (2014). According to this framework digital skills include categories of operational skills, creative skills, information navigation skills, and social skills. Each of these categories are instrumental to achieve effective interaction with digital technologies. In educational contexts,

where digital abilities are increasingly related to learning outcomes and future employment, these skills are especially pertinent. They represent a transition from basic interaction with technology to more complicated, productive, and interactive applications.

The basic technical skills needed to operate digital devices and interfaces are referred to as operational skills. This covers abilities such operating system navigation, file management, software installation or upgrading, setting adjustments, and input device use (such as keyboard, mouse, and touchscreen). It also includes troubleshooting little technological difficulties such basic system failures or network concerns. These abilities serve as the cornerstone for increasingly intricate digital practices. People may find it difficult to acquire and use digital tools efficiently if they lack fundamental operational proficiency (van Deursen & van Dijk, 2011). Operational skills are necessary in higher education to participate in virtual classes, access online resources, turn in assignments, and interact with digital learning systems.

More sophisticated skills include the capacity to create and distribute original content using digital technology, referred to as creative skills. This cover using design software and editing tools, as well as producing blogs, videos, podcasts, and websites. These abilities can be displayed in academic settings through digital storytelling, multimedia presentations, or group projects that make use of cloud-based resources. According to Anderson and Krathwohl (2001), creative skills are associated with higher-order cognitive processes and fit into Bloom's taxonomy of learning, especially in the domains of creation, assessment, and synthesis. Additionally, the digital economy's growing focus on innovation and content production highlights the value of creative skills for both professional and entrepreneurial efforts as well as academic achievement (Ferrari, 2012; Janssen et al., 2013).

Locating, selecting, assessing, and managing digital information are all part of information navigation skills. These skills are especially important in a time of misinformation and an excess of information. They cover issues like efficiently using search engines, locating reliable sources, cross-referencing material, and structuring data for academic or personal usage. They are essential for students to conduct research, write academic papers, and take part in knowledgeable online debates. Students who are adept at navigating information are more likely to perform better on assignments that call for independent study and critical thinking (Hatlevik and Christophersen, 2013).

The ability to engage, communicate, or collaborate in digital space securely and successfully is referred to as social skills. These consist of participating in social networks, comprehending online etiquette (also known as "netiquette"), and resolving concerns like cyberbullying and digital privacy. Social digital skills are becoming more and more important as online communities, remote learning,

and digital collaboration tools like discussion boards, shared documents, and video conferencing platforms proliferate. According to Helsper and Eynon (2013), one of the main factors influencing digital inclusion is the capacity to use digital communication technologies in ways that are socially acceptable. Additionally, social skills help students develop digital resilience by allowing them to take advantage of digital spaces' collaborative potential while navigating their risks and challenges.

We draw on these operationalizations to assess the digital skills of students while considering their effect on effective performance.

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Creativity is an important construct in the Higher Education context and also an important pre-requisite of dynamic workplace environments. In literature, creativity is a strong predictor of performance (Pesout & Nietfeld, 2021). Creative skills are part of the soft skills required in the 21st century. The usage of internet can enable creativity and according to literature those individuals who have higher creativity as compared to others report higher perceived performance, which seems linked to a slightly overconfident perception of their abilities (Pesout & Nietfeld, 2021). Therefore, we developed the following hypothesis:

> H1: Creative skills have a significant positive effect on students perceived performance.

To understand the reasons for variations in internet navigation skills, it is important to address not just access but also the capacity to seek, analyze, and apply information. These skills are required for users to comfortably navigate digital spaces and make effective use of online resources (van Deursen & van Dijk, 2014). According to literature, individuals with superior information navigation abilities are more likely to engage in various and frequent online activities because they can effectively identify relevant content and avoid misinformation (Hölscher, C., & Strube, G., 2000). Furthermore, technologically skilled individuals face less restrictions and difficulties online, potentially increasing their engagement levels (Hargittai, 2005). Therefore, we developed the following hypothesis:

> H2: Internet navigation skills have a significant positive effect on usage frequency.

Despite increasing internet exposure worldwide, regional differences in digital access and usage persist. The idea of the digital divide emphasizes that people in rural or sub-urban regions frequently experience constraints in internet access, infrastructure, and digital literacy as compared to those living in bigger cities (Helsper, 2012). Moreover, studies suggest that even when devices are available, rural residents use them less frequently due to infrastructure and socioeconomic inequalities (Salemink, Strijker, & Bosworth, 2017). Therefore, those living in urban areas are more likely to utilize a broader choice of digital services since they have quicker connections and more robust networks (Whitacre, B. E., & Mills, B. F., 2007). Individuals in rural areas may use the internet less frequently owing to slower connections, inadequate digital skills training, or fewer digital service options. Therefore, we developed the following hypothesis:

H3: Location has a significant effect on usage frequency.

Operational digital skills, as previously defined, are essential for effective Internet use. Without these essential abilities, consumers may struggle to access digital material, resulting in decreased confidence and usage frequency (Eshet, 2012). Literature suggests that people with greater operational skills are more willing to experiment with various online functionalities since they can perform fundamental digital chores smoothly and without frustration (Claro et al., 2012; Hertzum, M., & Hornbæk, K., 2023). As a result, improving operational abilities can greatly boost a user's chance of using technology on a regular and effective basis. Therefore, we developed the following hypothesis:

H4: Operational skills have a significant positive effect on usage frequency.

In today's digital learning environment, social digital skills are critical to student performance. These abilities allow students to participate in online conversations, work on group projects, and interact effectively with peers (Greenhow & Robelia, 2009). Strong social digital skills help students feel more connected and engaged, which are important indicators of performance (Junco, 2012). Furthermore, good digital communication enables students to seek assistance, discuss ideas, and provide or receive feedback—activities that contribute to improved perceived academic performance (Ilgaz & Gülbahar, 2015). As collaborative and participatory technologies become more prevalent in education, students with strong social digital skills are more likely to see themselves as competent and successful in these settings. Therefore, we developed the following hypothesis:

H5: Social skills have a significant positive effect on students perceived performance.

Students' perceptions of their performance on digital tasks might be significantly influenced by how frequently they utilize digital tools and the internet. Frequent use has been associated with better skills, familiarity, and confidence, all of which improve students' self-perceived performance in both academic and professional contexts. Students perceived digital performance increase as they use digital platforms more regularly because they are more likely to improve their skills, solve problems effectively, and use digital resources to satisfy their learning goals. Previous research has demonstrated a positive relationship between perceived digital competence and the frequency of digital interaction, indicating that experience strengthens perceived performance (van Deursen & van Dijk, 2011; Hatlevik et al., 2015). Therefore, we developed the following hypothesis:

H6: Usage frequency has a significant effect on students' perceived performance.

On the other hand, the spread of information and communication technologies is ionluenced by several hard variables, including technological infrastructure and economic growth (Hermeking, 2006). The diffusion of these technologies in a country reflects the combination of these factors and shapes the affordance of technologies by people and their extension to different sectors of society. Thus, having access to the information and communication technologies from one's location is strongly related to digital skills (Kuhlemeier & Hemker, 2007). Having access is normally related to greater usage and studies suggest that those who access the internet more often report higher digital skills as compared to those who do not have often access. This is in line with extant literature on digital inequality, which highlights how contextual differences affect digital behavior and performance (Park, 2017). Therefore, we developed the following hypotheses

H7: Location mediates the relationship between operational skills and usage frequency.

H8: Location mediates the relationship between internet navigation skills and usage frequency.

Methodology

Measurement instrument

We checked and reviewed previously used scales in the literature, to adapt the scales in our model and develop the measuring instrument in line with the literature. The measurement instrument for the conceptualization of internet

skills was adapted from Van Deursen, Helsper & Eynon (2014). The measurement instrument consists of two main sections: 1- the first collects general information on trainings, frequency of internet usage, preferred device to access the internet and type of activity for which the internet is used; 2- the second collects specific information on the set of skills to measure respondents' perceived digital skills across four main dimensions: operational skills, internet navigation skills, creative skills and social skills (ranging from 1 = Not at all true of me, to 5 = Very true of me); and 3- the third collects socio-economic and demographic information on the sample. Before submitting the questionnaire, the respondents had to consent to the usage of the information shared and for the data we got we considered the approved consent to proceed with the data analysis. Therefore, all the questionnaires with no granted consent were excluded from the data analysis process. Detailed information on the adapted scales is presented in Table 1.

A questionnaire was developed and shared with students. Before sharing the questionnaire with the target respondents, pilot testing was carried out with a convenience sample of 5 individuals to check for the readability and the level of understanding of the questionnaire, as well as reduce the possibility of misleading questions. The comments gathered from the pilot testing of the questionnaire were used to improve it before proceeding with the data collection process. Making use of the students database of the European University of Tirana, we reached and shared the questionnaire through electronic means. The sample was random, yet the participation in the questionnaire was voluntary. The combination of these means to reach potential respondents aimed to reduce the non-response bias. The questionnaire was self-administered, and respondents were assured that the purpose of the data collection was purely academic. Before submitting the questionnaire, they were asked to consent the usage of the information shared with the researchers. A total of 321 responses were returned. Yet, after removing the questionnaires of the respondents who do not consent to the usage of their data, we remained with an effective sample size of 268 respondents, which according to research guidelines are considered sufficient for this analysis (Hair, Ringle and Sarstedt, 2011). Regarding the demographic composition of our sample, most respondents are female accounting for

72.45 of our sample and most represented age group is the 18-21 age group accounting for 70.9% of our sample. Table 2 summarizes the demographic characteristics of our sample.

TABLE 1. Measurement instrument operationalization

Dimension	Dimension Items	Representative
Operational skills OS	OS1. I know how to open downloaded files. OS2. I know how to download/save a photo I found online. OS3. I know how to use shortcut keys (e.g. CTRL- V). OS4. I know how to open a new tab in my browser. OS5. I know how to bookmark a website.	(Van Deursen, Helsper & Eynon, 2014)
Social skills SocS	SocS1. I know which information I should and shouldn't share online. SocS2. I know when I should and shouldn't share information online. SocS3. I am careful to make my comments and behaviours appropriate to the situation I find myself in online. SocS4. I know how to change who I share content with. SocS5. I know how to remove friends from my contact lists.	(Van Deursen, Helsper & Eynon, 2014)
Creative skills CS	CS1. I know how to create something new from existing online images, music or video. CS2. I know how to make basic changes to the content that others have produced. CS3. I know which different types of licences apply to online content. CS4. I would feel confident putting video content I have created online. CS5. I know how to design a website.	(Van Deursen, Helsper & Eynon, 2014)
Perceived performance PSD	PSD1. During my studies I have developed critical thinking skills. PSD2. During my studies I have developed problem solving skills. PSD3. During my studies I have developed practical and laboratory skills.	(Yasa, Rahayu, Handayanto, & Ekawati, 2024)

TABLE 2. Demographic Characteristics

Attributes	Distribution	Frequency	%
Gender	Female	194	72.4%
	Male	73	27,2%
	Other	1	0.4%
Age	18-21	190	70,9%
	22-25	54	20,1%
	26-29	9	3,4%
	30+	15	5,6%

Results

The data obtained through the questionnaire were statistically analysed. Initially, a Confirmatory Factor Analysis (CFA) was carried out to confirm the structure of the factors in our measurement instrument. Next, we carried out a structural equation modelling technique, which is a common method of studying emergent variables (Hair et al., 2012; Dirsehan and Henseler, 2022). The graphical output of the model is presented in Figure 1 below.

Confirmatory factor analysis

The confirmatory factor analysis was used to assess the factor structure for the observed variables. This is a first step to model assessment and aims to ensure that the item scale is relevant and holds to the data collected. A common practice is to omit the items/factors that do not hold and therefore this step is instrumental to further analysis. After omitting the indicators that do not contribute to their respective factors, we were left with 3 items for social skills, 4 items for operational skills, 4 items for internet navigation skills and 5 items for creative skills (see Table 3). In our analysis, the loadings of these indicators are greater than 0.50, which demonstrate an acceptable contribution to their corresponding factors (Brown, 2015).

TABLE 3. Factor structure results

Factor	Indicator	Estimate	SE	z	p
Operational Skills	OS1	0.765	0.0579	13.22	<.001
	OS3	0.830	0.0770	10.78	<.001
	OS4	0.683	0.0587	11.64	<.001
	OS5	0.523	0.0514	10.19	<.001
Creative Skills	CS1	0.669	0.0531	12.60	<.001
	CS2	0.949	0.0690	13.75	<.001
	CS3	0.893	0.0829	10.77	<.001
	CS4	0.810	0.0753	10.75	<.001
	CS5	0.688	0.0961	7.17	<.001
Internet Navigation Skills	INS2	0.777	0.0868	8.95	<.001
	INS3	0.694	0.0758	9.16	<.001
	INS4	0.909	0.0878	10.36	<.001
	INS5	0.819	0.0988	8.29	<.001
Social Skills	SocS1	0.514	0.0557	9.22	<.001
	SocS2	0.489	0.0527	9.28	<.001
	SocS4	0.630	0.0659	9.57	<.001
Perceived Performance	PSD1	0.759	0.0640	11.87	<.001
	PSD2	0.710	0.0615	11.55	<.001
	PSD3	0.850	0.0778	10.92	<.001

To confirm the factorial structure, the goodness of fit indices was computed for the full scales obtained from the confirmatory factor analysis. According to the results, a sufficient to good model fit is suggested by the approximate fit indices for this CFA model.

Initially we considered the chi-square (χ^2), which is a commonly used test to assess the exact fit of a specified model. The test compares the observed and model-implied covariance matrices, to assess how well a model fits data. The results show a chi-square value of 270 with 142 degrees of freedom (df). Since the chi-square test alone does not provide conclusive information due to its' sensitivity to sample size, the relative chi- square was computed ($\chi 2/df$) (Wheaton, Muthen, Alwin, & Summers, 1977). Literature suggests that values below 3 indicate a good fit between the hypothesized model and the observed data (Cole, 1987). A more nuanced picture of how well the model fits the data is provided by approximation fit indices. For instance, Hu and Bentler (1999) suggest adding indices that take into account model complexity and approximate rather than exact fit, such as the Root Mean Square Error of Approximation (RMSEA), Tucker-Lewis Index (TLI), and Comparative Fit Index (CFI), to the chi-square test.

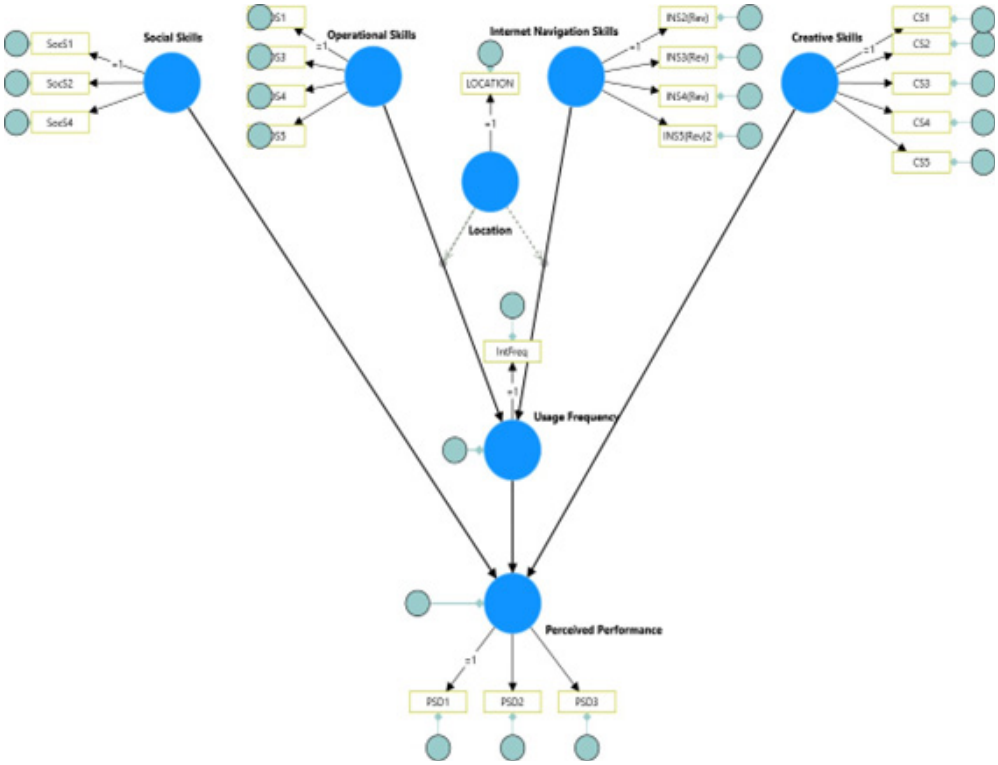
The value for the Comparative Fit Index (CFI) is 0.914, which is above the accepted threshold of 0.90 and indicates an appropriate fit (Hu & Bentler, 1999). For a "good" fit, according to some stricter standards, the CFI should be ≥ 0.95 (Hu & Bentler, 1999). However, in applied research, a CFI above 0.90 is usually accepted, especially in complex models or when sample sizes are moderate. Next, the Tucker-Lewis Index (TLI) value of 0.897 is marginally below the 0.90 criterion. Nonetheless, values near 0.90 can still be considered appropriate, particularly if they are supported by additional fit indices, as in this case. The RMSEA value of 0.058 is within the acceptable model fit range. According to literature, RMSEA values below 0.05 imply close fit, values between 0.05 and 0.08 suggest adequate fit, while values above 0.10 indicate poor fit (Cudeck, 2000; MacCallum, Browne, & Sugawara, 1996). The 90% confidence interval (CI) for RMSEA values range from 0.0474 (lower bound) to 0.0684 (upper bound), which fall again within the accepted values and additionally supports a conclusion of good to acceptable fit.

When combined, these approximate fit indices imply that, although the model does not attain perfect fit (as the chi-square test indicates), it does fit the data sufficiently for use in a broad range of research scenarios.

TABLE 4. Goodness of fit indices results

Fit indices	Accepted value	Model value
χ^2 (Chi-square)	-	270
df (Degrees of Freedom)	-	142
χ^2/df (Relative Chi-square)	< 3	1.9
CFI (Comparative Fit Index)	≥ 0.90	0.914
TLI (Tucker-Lewis Index)	≥ 0.90	0.897
RMSEA (Root Mean Square Error of Approximation)	< 0.10	0.0580
RMSEA 90% CI Lower bound	< 0.05	0.0474
RMSEA 90% CI Upper bound	> 0.10	0.0684

FIGURE 1. Output model



Model testing

The model was assessed for the full sample (N = 268). The structural model was tested for explanatory power and path significance. The results of the path coefficients for our model and total variance explained are reported in Table 4 and 5. Path coefficient values fall between "-1" and "+1". Values falling closer to "-1" represent strong negative relationships between the observed variables, whereas values falling closer to "+1" represent strong positive relationships between the observed variables. H1 posits that digital creative skills have a significant positive effect on perceived performance. According to the results creative skills have a strong significant positive effect on perceived performance (ß=0.606; p=0.0000). Thus, H1 is supported. H2 posits that internet navigation skills have a significant positive effect on usage frequency. Based on the results, surprisingly internet navigation skills have a significant negative effect on usage frequency (ß=-0.285; p=0.034). So H2 is partially supported. H3 posits that location has a significant effect on usage frequency. The results show that location has a significant negative effect on usage frequency (ß=-1.298; p=0.005). So, also H3 is supported. H4 posits that operational skills have a significant positive effect on usage frequency. The

results show that operational skills do not significantly affect the usage frequency (ß=0.051; p=0.728). Thus, H4 is rejected. Next, H5 posits that social skills have a significant positive effect on students' perceived performance. The results show that social skills have a significant positive effect on perceived performance (ß=0.342; p=0.006). Thus, H5 is supported. H6 posits that usage frequency has a significant effect on students' perceived performance.

The results show that usage frequency has a significant positive effect on perceived performance (ß=0.343; p=0.000). Thus, also H6 is supported. H7 posits that location mediates the relationship between operational skills and usage frequency. The results show that the relationship between operational skills and usage frequency is not moderated by location (ß=0.124; p=0.357). Thus, H7 is rejected. Lastly, H8 posits that location mediates the relationship between internet navigation skills and usage frequency. The results show that the relationship between internet navigation skills and usage frequency is mediated by location. Thus, also H8 is supported.

TABLE 4. Results of structural model

Effect	Path Coefficients	Std. error	t-value	p-value
H1: Creative Skills-> Perceived Performance	0.606	0.106	5.736	0.000
H2: Internet Navigation Skills->Usage Frequency	-0.285	0.134	2.135	0.034
H3: Location -> Usage Frequency	-1.298	0.455	2.854	0.005
H4: Operational Skills -> Usage Frequency	0.051	0.147	0.349	0.728
H5: Social Skills-> Perceived Performance	0.342	0.123	2.785	0.006
H6: Usage Frequency -> Perceived Performance	0.343	0.083	4.144	0.000
H7: Location x Operational Skills -> Usage Frequency	0.124	0.134	0.922	0.357
H8: Location x Internet Navigation Skills -> Usage Frequency	0.261	0.084	3.114	0.002

The coefficient of determination (R2) was used to assess the explanatory power of the structural model (Henseler, Hubona and Ray, 2016). R Square statistics are a common criterion used to explain the variance in the endogenous variable explained by the exogenous variables. Therefore, it indicates that the model explains a good proportion of the variances observed in the dependent variable. According to Hair, Ringle and Sarstedt (2011), R2 values of 0.75 can be considered substantial, values of 0.50 can be considered moderate, and of 0.25 can be considered weak. In this study, adjusted R square of perceived performance is 0.476 and is sufficient to establish a moderate relationship between the variables. While is of interest the result of usage frequency with an adjusted R square of 0.715 establishes a strong relationship between the variables, thus suggesting that the frequency of usage of digital tools is a major contributor to their reported digital skills.

TABLE 5. Coefficient of determination results

Construct	Coefficient of determination (R^2)
Perceived Performance	0.476
Usage Frequency	0.715

Discussion

This study explores the role of individual-level factors that are responsible for variabilities across student populations in self-reported digital skills in Albania drawing on a sample of 268 students.

This study confirms that creative skills, social skills, and usage frequency are strong predictors of students' perceived performance, which is in line with extant research. In this context, social skills enhance the perceived performance of students and those reporting higher social skills perceive higher levels of performance as compared to those who report lower social skills in the digital space. Moreover, the findings confirmed that frequent usage of digital tools improve students' perceived performance. This is understandable if we consider the learning effect taking place in digital spaces. Students who use digital tools frequently will improve their proficiency. The variance in the relationship between internet navigation skills and usage frequency can be instrumental to the location from where students access the digital space. Therefore, confirming the digital divide, the findings of this study suggest that students living in rural areas use digital tools less, and this in turn leads to lower perceived digital performance. The frequency and proficiency of students' usage of digital technologies can be partially attributed to their location. Together, these factors have all significantly impacted the perceived performance of students in the digital space.

The findings of this study make important contributions to both literature and practice, as well as can serve to inform policymakers' decisions. This study contributes and advances literature on digital skills through three main directions: 1) the context of the study which considers Albanian University students, 2) the extension of understanding of contextual and individual level factors on students digital skills, and 3) the integration of location and frequency of usage of digital tools variables as mediators to the study model. The findings complement the understanding of students' digital literacy through a holistic model that can address actions. Furthermore, the digital divide theory is expanded and challenged by these findings. The first-level divide, or access to technology, has traditionally been the primary way in conceptualizing the digital divide. According to van Deursen and Helsper (2015), more recent studies, however, highlight the second- and third-level inequalities, which are associated with variations in digital capabilities and outcomes, respectively. The findings of this study can add

empirical support to these complex layers by demonstrating how environmental and demographic factors influence not only access to digital technology but also its' use and consequent advantages. In the Higher

Higher Education institutions, they can enhance the support of students with methodologies and training programs that facilitate the learning and practice of digital skills for academic purposes. Additionally, in the dynamic labor market, employability outcomes are highly linked to digital abilities. In order to work with industry partners and improve their reputation, universities who can show that their graduates have strong digital capabilities are in a better position. To establish collaborations with businesses and make sure that curriculum meet the changing needs of the labor market, Higher Education institutions can utilize digital skill data (Vuorikari et al., 2016). Furthermore, regular monitoring of digital skill trends can support quality assurance processes and provide data for institutional accreditation or benchmarking exercises. Policy level initiatives should consider to reduce the structural barriers coming from unequal access to digital tools, poor infrastructures and other disparities resulting from location-based factors (as of rural, sub-urban or urban areas). The findings call for an improvement of the digital infrastructure, aiming to close the digital divide.

While the majority of digital skills training programs concentrate on technical skills, it is also necessary to shift attention to other skills that foster creativity and a social perspective on the use of digital tools, as the findings indicate that operational skills do not significantly predict usage frequency, either directly or mediated by location. To add to that, contextual barriers shall be considered when designing and implementing digital technologies. So that students can benefit equally from these tools, they will need to have good access to Internet and a proper infrastructure.

The integration of digital technologies in Higher Education Institutions is fundamental for the development of students' technological skills and for their professional future. Policies should ensure a touching point between skills learned at Higher Education Institutions and labour market requirements. Overall, the findings of this study may guide the provision of trainings, digital skill-centric methodologies of teaching and student- tailored curricula that respond to the need of varying skills' proficiency of students.

Conclusions

A conceptual model for perceived digital skills, encompassing four main dimensions of digital skills, was developed and tested through means of structural equation modelling. The postulated correlations between the variables were empirically validated using structural equation modelling. The findings of this

study offer empirical evidence in favor of the core roles that creativity, social skills, and usage frequency play in influencing students' perceived performance in digital settings. The findings show that students are more likely to report higher digital performance if they use digital tools regularly and have stronger social and creative skills. These findings demonstrate the learning-by-doing impact in digital environments, where practice and exposure build digital skills. However, the data also shows a continuing digital gap, with students in rural regions reporting lower levels of perceived skills and usage because of poorer infrastructure and limited access. Being it a causal-predictive approach, the findings enrich the understanding of digital skills and the role that Higher Education Institutions play in supporting students with the acquiring of digital skills, thus paving the way to their future professional journey. By providing a contextualized view of the development of digital skills among Albanian university students, the research makes significant additions to the literature on digital literacy. The study is unique because it provides a holistic framework for evaluating digital skills by taking into account contextual factors (such as location and usage frequency) as well as individual factors (such as creativity and social skills). The research expands the debate about digital inequality by including location and usage as mediators in the model, particularly in underrepresented contexts. These observations enable the creation of inclusive digital education policies that take into account regional differences and the socio-technical realities of student populations by offering a nuanced foundation for policymaking.

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From a practical perspective, the results highlight the necessity for governments and higher educational institutions to provide more than just technical instruction in digital skills. Training programs should be comprehensive, addressing contextual and infrastructure limitations while incorporating the creative and social aspects of digital inclusion. Additionally, by encouraging flexible and diverse digital skills, curriculum design and instructional strategies must meet the demands of the labor market. Targeted investments in digital infrastructure and the creation of specialized support systems catered to the various requirements and backgrounds

of students are necessary to close the digital divide and improve students' digital readiness.

The findings of this study must be considered in light of its limitations. The main limitation is related to the voluntary participation in this study which may lead to biased results. Participation and the readiness to provide personal information, especially with relation to digital skills, were completely voluntary, even though the sample was initially selected using random selection approaches. Because of this, people who are more comfortable or involved with digital technologies may be overrepresented, which could

skew the results in favor of those with greater self-reported skills. The external validity and generalizability of the findings are thus limited, as the results might not accurately reflect the digital proficiency levels of fewer digitally literate students who might have chosen not to participate in the study. Therefore, higher rates of reported digital skills could be attributed to voluntary participation.

Additionally, the study's interpretation of digital skills shall be revised within the framework of continuous conceptual development. There is variation in how participants may view or evaluate their own skills due to the ongoing revision of definitions and frameworks surrounding digital skills brought about by the advancement of technology (Van Deursen & Helsper, 2015). Respondents may understand digital literacy differently because of its' multifaceted nature, which includes everything from fundamental operational skills to critical review and content creation, particularly in distinct demographic groups. This conceptual flexibility makes it more difficult to test digital skills consistently and could compromise the accuracy of self-reported data. It would be advantageous for future research to use validated, standardized assessments of digital skills that are updated frequently to account for social usage and technical advancements.

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