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Evaluating Digital Proficiency: A Study on Online and Face-to-Face Educational Engagement among Rural Middle School Students in Republic of Moldova

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Abstract: *Digital disparities concerning access, skills, and utilization of digital technology pose a barrier to engagement in e-learning processes, ultimately serving as a significant source of exclusion, inequality, and social isolation. This quantitative study involved 1526 middle school pupils residing in the rural regions of Moldova. The objective of this research is to evaluate students' digital competencies and their perspectives on the online learning experience. Our results indicate that the highest digital competence area is Digital content creation (DC) and the lowest is "Problem-solving" (PS). We also found a positive correlation between face-to-face discussion with the teacher and the mean scores from the digital skills level, the correlation seems to be mediated by the variable "the possibility to ask the teacher" (PAT). The discussion revolves around the role of the teacher as an intermediary and mediator in the education process, emphasizing the concrete interaction between teachers and students as a fundamental element in enhancing and improving digital skills.*

Keywords: *education; digital inequalities; online education; gender; digital divide.*

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Introduction

Currently, Information and Communication Technologies (ICTs) present opportunities and have been shown to positively influence both social well-being and economic growth (Box & West, 2016; Manyika & Roxburgh, 2011; Castellacci & Tveito, 2018). The Internet has become deeply integrated into many aspects of daily life, including leisure, work, and education (Box & West, 2016; Stevenson, 2009). Thus, access to the internet and technology, as well as knowledge of its use, has become a significant individual advantage, as previously highlighted by Van Laar et al. (2017). Additionally, disparities in access to technology and skills to use ICTs can significantly impact individuals' lives (McCarthy, 2022). The topic of the digital divide has garnered increasing interest in research, particularly regarding disparities in skills.

The discrepancies in levels of digital skills are becoming increasingly acknowledged as a significant factor contributing to social inequalities in the uptake of modern ICTs use (DiMaggio et al., 2004). Theoretical models highlight the essential role of digital proficiency in promoting individuals' social integration and career progression (Van Dijk, 2006; Mossberger et al., 2007; Hargittai, 2010; Robinson et al., 2015).

Due to the rapid advancement of new technologies, the urgency for the digital modernization of the education system in the Republic of Moldova is becoming increasingly urgent. Investing in digital training and education throughout one's life is no longer optional, but a necessary requirement for participation in economic and social life, in some cases even becoming a criterion for exclusion. Education has a fundamental role in creating and developing a knowledge society by ensuring the skills needed for the century in which we live, representing one of the tools that can determine the upward economic and social path at the national level. Thus, recognizing the necessity to cultivate digital competencies is acknowledged as one of the eight fundamental skills, it could be asserted that structured education is essential in equipping individuals with the confidence and analytical abilities needed to proficiently utilize various ICTs for information, communication, and problem-solving in various aspects of their daily routines. *Equity* in education is also a dimension measured in the PISA tests. Recent data on the education system in Moldova (Huisman et al., 2018) indicate a discrepancy, determined by factors such as social background and socio-economic status.

The challenges in education arising from the COVID-19 pandemic have intensified the pre-existing connection between digital inequality and social inequality, as indicated by Robinson et al. (2015). This highlighted the

connection between inequality in access to digital devices ((also referred to as the " first level of digital divide") and educational opportunities. The pandemic has also highlighted that students from low-income families and underprivileged communities face obstacles when trying to access digital technology devices and online learning, further widening the gap in educational opportunities between these students and their more privileged peers. This study examines the various digital disparities in the educational context. Through assessing students' digital skills, our objective is to identify the disparities in digital proficiency associated with the secondary tier of the digital division. As these are closely related to the outcomes and benefits that students can derive from interacting with ICTs, it is essential to investigate the digital disparities linked to the third level of the digital division. The other goal of this paper is to explore the effects of technology access and skills on educational achievements and opportunities.

Digital divide in education: national context

The concept of digital proficiency encompasses various domains, including fostering students' awareness of Internet safety, mastery in digital communication, skilled retrieval of digital information, proficient generation of digital content, and successful digital problem-solving skills.

This interpretation of digital competence aligns with the digital competence framework outlined by the European Commission (Binkley et al., 2012; Ferrari & Punie, 2013) and the 21st Century Skills theory.

Digital inequality is a concept that refers to disparities in the knowledge and ability of individuals in using ICTs. Although the phenomenon is relevant and affects people of all ages, young people and children are especially vulnerable because differences in their knowledge of information technology severely restrict their future schooling and employment opportunities (Hargittai & Hinnant, 2008, Rundel & Salemink, 2021). The concept of digital inequality is commonly defined as the disparities in both access to and proficiency with technology among individuals. Beaunoyer et al. (2020) describe this as the ability of a person to acquire, process, engage with, and understand the information required to gain advantages from using digital technologies. Demeuse & Baye (2008) highlight the disparities in education and student performance among different countries and educational systems. Western European societies generally report higher levels of digital competency among their citizens compared to Eastern European countries (Toader et al., 2023). The Republic of Moldova can be particularly notable for the large gap in performance between high-achieving and low-achieving students, with this gap being

primarily determined by the student's place of residence (urban or rural). Given that the Republic of Moldova is located within lower-middle-income economies, there is a specific focus on identifying the digital disparity and discrepancies among students, who are perceived to be more vulnerable to the effects of these phenomena (Ingram, 2021). The social challenges that arise from events such as the COVID-19 pandemic, which have resulted in the necessity for teaching to be conducted remotely, have brought attention to the issue of digital inequality within households. The mandatory shift towards digitalization (Grecu, 2021) in education across all levels has underscored the uneven distribution of technology access and digital literacy skills, presenting obstacles for individuals and families lacking the means to engage fully in online education.

In the context of the COVID-19 pandemic, traditional forms of teaching have given way to digital instruction. The urgent nature of this transition to online education has generated a multitude of challenges among all actors involved in the educational process. In 2019, the Republic of Moldova had an internet penetration rate of approximately 79.9%, according to UNICEF (2020). However, 16,000 students (constituting 4.8% of the total) and 3,000 teachers (making up 10.6% of the total) lacked access to ICT tools such as laptops, tablets, or internet access. Consequently, they were unable to consistently participate in the educational activities conducted in the online environment.

By analyzing official data (The World Bank (n.d) in the number of mobile phones held by Moldovan households per 100 households in 2019-2020, shows an overall upward trend. However, upon examining particular regions, we observe a downward trajectory in urban areas and an upward trajectory in rural areas. It is noteworthy that while there is an upward trend in the proliferation of mobile phones in rural regions, the prevalence remains considerably lower than that observed in urban locales. Analyzing data regarding the possession of computers, notebooks, and tablets reveals a significant difference, with a nationwide average of 66 such devices reported per 100 households in 2019. In rural areas, this figure slightly surpassed 50 units. As is indicated in the ITU (2021), report concerning Connectivity within nine non-European Union nations in the European region, Moldova exhibits a comparatively favorable standing relative to its counterparts in the region.

Referring to how the key competencies are defined and framed in the sets of educational policies in Moldova, in the Education Law, in force during 1995-2014, the term "competence" is used to state the capacity the fathers of an authority, of an institution, of an official, etc. to exercise certain attributions and, less so, to explicitly indicate knowledge, the skills and attitudes that a

student must show at the end of an educational program. At the national level, there is a lack of legislative measures aimed at reducing digital disparities among students and fostering the systematic development of digital skills.

Data from Moldova's National Bureau of Statistics (2020) indicates that there are 32,501 computers deployed in schools nationwide, of which 28,500 are allocated for instructional purposes. Concerning students' proficiency in digital skills, it is observed that a majority of students possess minimal or inadequate digital competencies, falling short of the prescribed standards established by the Ministry of Education. The most precarious situation is evident in their ability to manipulate data in spreadsheet formats. As a result, only 15.9% of students demonstrate moderate or high digital skills in this area, while 23% of students exhibit no proficiency whatsoever in spreadsheet applications, receiving zero points in assessments (Coşuleanu et al., 2023). Evaluating digital skills stands as a pivotal factor in fostering their enhancement. Ensuring a comprehensive, transparent, and efficacious assessment mechanism fosters the motivation of all stakeholders towards the continual improvement of digital skills.

The digital gap in rural areas

The difference in digital resource access between urban and rural families can further deepen inequalities in their ability to invest in educational resources. This can worsen disparities in educational opportunities and outcomes, ultimately strengthening social hierarchy. The social inequalities (environment of origin, economic status of the family, the presence of a disability, gender, etc.) existing among children generate disproportions in terms of equal opportunities for all children. According to existing literature, various aspects of digital skills are influenced in differing ways by social characteristics. A widely acknowledged distinction exists in digital skills, separating the technical/operational dimension, focusing on the proficiency in using computer software and web browsers, from the informational dimension, which emphasizes the ability to evaluate, analyze, and repurpose digital information (Mossberger et al., 2007; Van Dijk, 2006). These divisions and gaps between children are also projected in the digital environment, the literature has confirmed that those who have a low position in society are prone to exclusion and marginalization in the digital arena (Helsper & Reisdorf, 2017; Ragnedda, 2018; Van Deursen & Van Djik, 2019; Ritzhaupt, 2020). In the examination of digital skills, gender and cultural background are commonly seen as inherent social traits treated as independent variables (Gui, 2007). Nevertheless, the predominant factor linked to differences in digital skills has become the level of education (Van Deursen & Van Dijk, 2009;

Hargittai, 2010). The context of social vulnerability involves reducing the level of digital democratization, access to technology and digital skills, thus forming a barrier to participating in an educational form in the online environment and ultimately a major source of exclusion, inequality and social isolation (UNICEF, 2020; Van Dijk, 2020; Seymour et al., 2020).

Initially, the notion of a digital divide pertained to disparities in access to computers or the Internet (Warschauer, 2002; Van Deursen & Van Dijk, 2011; Elena-Bucea et al., 2021). Nevertheless, with the reduction of discrepancies in access within certain educational institutions, according to (Korupp et al., 2004; Fraillon et al., 2014; Datoo, 2021) it becomes evident that additional factors play a crucial role, including students' utilization of digital resources at home, their duration of experience with computers, academic aspirations, and familial background. The studies show, in particular, a lack of access to technology based on geographical factors, with access to rural areas being reported as much more precarious (Strover, 2001; Townsend, 2001; Malecki, 2003). At present, although somewhat digitally reduced, it is still more prevalent in rural areas compared to urban areas (Vogels, 2021; Vassilakopoulou & Hustad, 2023).

The digital divide is evidently influenced by geographic factors as well. There are differences in digital skills and access to technology based on the area of residence, this is relevant both internationally, and different levels of competence and access are reported from one country to another (Inegbedion, 2021; Vicente & López, 2011), but also nationally. Internally, most countries report digital inequalities between regions and mediums of residence such as rural and urban (Serhat, 2023; Stojanović, 2022). Typically, in literature, urban areas are suggested to have lower levels of digital inequality compared to rural areas (Rundel & Salemink, 2021).

The level of education is by far the most important variable, in relation to both general and advanced uses of ICTs (Ragnedda & Muschert, 2013; Fang et al., 2019; Pettersson, 2018; Alexandru & Scoda, 2020). Therefore, digital knowledge and skills are considered among the main factors influencing social stratification and determining the opportunities of individuals in the labor market (Ragnedda & Ruiu, 2017). Therefore, incorporating ICTs in schools is seen as a way to address the social inequalities faced by students and can help to reduce digital inequality. Utilizing ICT in the educational system can offer equal chances for all students, irrespective of their socio-economic status, to acquire and enhance digital literacy abilities.

By examining the response of the Republic of Moldova to digital inequality and evaluating the impact of the digital divide on economic disparities, Pisica (2022) identified a significant digital gap between rural and

urban regions. The research further indicates the considerable lack of readiness among Moldovan households to address digitalization requirements at the onset of the pandemic in 2019. Furthermore, the study underscores a significant disparity between the top (recording 2.42%) and bottom (2.25%, respectively) quintiles in both 2019 and 2020, signifying a substantial digital divide between the most affluent and the most economically challenged segments of society, with rural regions experiencing significant deprivation. Osoianu et al. (2011) referring to the Republic of Moldova and the urban-rural digital gap, indicates that the digital divide exhibits is significantly higher in rural settings, wherein the utilization of computers and the internet is approximately half that of urban areas, particularly within the context of public libraries. Based on statistics provided by the National Statistics Bureau (2019; 2020), the disparity in Internet connectivity between urban and rural areas remained significant, with a 23.5% gap in 2019 and a 20.6% difference in 2020. This data illustrates the inability of the rural population to access a broader range of educational, social, and economic opportunities due to digital poverty.

Face-to-face interaction in teaching process

As the world becomes more technologically advanced, there has been a transition towards an education system mediated by ICTs. In their examination of student contentment within a hybrid learning environment, So & Brush (2008) observed that students who reported a greater extent of collaborative learning tended to express higher levels of satisfaction with their distance course, as compared to those who reported a lower degree of collaborative learning. Given the rising prevalence of online education, it's crucial to contemplate how the absence of face-to-face engagement might affect learning results. Fiorella et al. (2017) emphasized that demonstrating video models from the learner's point of view can notably enhance task performance, such as circuit assembly, compared to displaying videos from a third-person perspective. However, recent research suggests that face-to-face interaction may also play a crucial role in facilitating learning and innovation. For instance, one study found that observing a solution from a face-to-face perspective, as opposed to next to or perpendicular to the model, led to better performance in both children and adults. The authors argue that face-to-face interaction not only provides visual information about the task but also important social cues about goals and motivations, which can enhance creativity and innovation beyond mere mimicry of the teacher's actions (Ransom et al., 2022). The inquiry also raises the question of whether face-to-face interaction should be regarded as a vital element for

optimal learning in tasks that entail visuospatial skills (Hoogerheide et al., 2016). Therefore, the question remains as to whether face-to-face interaction should be considered a necessary component for optimal learning, particularly in tasks that involve visuospatial skills. In summarizing this research, it can be inferred that there are no significant distinctions in the roles performed by educators in the two instructional modalities, whether online or face-to-face. Any discernible variations, if present, are likely attributed to the level of teacher engagement and the institutional commitment to the instructional program. Both modes underscore the importance of psycho-pedagogical, technical, and organizational facets in education. Tasks that receive favorable assessments from teachers are similar in both instructional systems, combining theoretical content explanation with practical activities, and fostering interaction (Hoogerheide et al., 2016).

In addition to these experiments, recent studies focus on students' views of online learning compared to in-person learning, discovered that traditional classroom instruction received higher ratings in terms of social presence, interaction, and satisfaction compared to online learning (Allen et al., 2006; Bali & Liu, 2018; Tomasik et al., 2021). Online students prioritize flexibility and accessibility, while face-to-face students value classroom interaction and although online learners face challenges with technology and feedback, they most prefer online learning to achieve their educational goals (Mather & Sarkans, 2018). As it stands now, the role of face-to-face interaction in learning, particularly in tasks that involve visuospatial skills, is a topic of ongoing debate. While some argue that direct interaction with instructors and peers is essential for optimal learning outcomes, others suggest that technology-mediated instruction can be equally effective.

The COVID-19 outbreak has compelled numerous educational institutions to pivot towards online education, unveiling both its benefits and drawbacks. While studies conducted during this period have shown that online learning can offer increased comfort and accessibility, they have also highlighted issues around academic integrity and inefficiency (Mukhtar et. al., 2020; Neagu, 2022). These challenges are even more apparent when it comes to digital skills acquisition, as there are concerns around the importance of face-to-face interaction in this context.

Studies indicate that gender may have a notable impact on shaping individuals' experiences and results in digital educational settings, particularly within STEM fields (Kim & Meister, 2022). As the world increasingly relies on online platforms for teaching and learning, it is necessary to understand the influence of gender on acquiring and applying digital skills.

Methodology

Amidst the COVID-19 pandemic and the limitations imposed on in-person interactions, the procedure for data collection in this study sought to minimize in-person contact with respondents as much as possible. However, due to the nature of the research topic, some travel was necessary to allow students without access to technology to participate in the survey. For respondents who had access to technology, the questionnaire was distributed using the Google Forms tool[1]. The study also considered ethical requirements, such as ensuring non-coercion and maintaining the confidentiality of the data collected**.**

The current study aims to assess students' digital competence level. A multidimensional approach to studying digital inequality is proposed, which considers not only access ICTs but also the frequency and quality of use of technologies. This approach considers multiple factors that contribute to digital inequality and provides a deeper insight into the matter.

Starting from the research aim, the following hypotheses were formulated and tested:

H1: *The digital skills of girls are at least equivalent to or marginally superior to those of boys.*

H2a: *Attending in-person classes promotes the growth of digital skills.*

H2b: *The chance to inquire or participate in class discussions during in-person sessions may further enhance pupils' digital skills.*

Sample

In the current paper, we used a sample of 1526 middle school students aged 12-16 (M = 14) residing in rural areas of the Republic of Moldova, equally distributed in terms of gender (54.2% girls).

Measurement

The fundamental tool of this research is built upon the European Digital Competence Framework (2022), DigComp 2.2[2], which serves as both an instrument and a reference framework. This framework offers over 250 fresh instances of knowledge, abilities, and mindsets that empower individuals to interact with digital technologies, including cutting-edge ones like artificial intelligence (AI), in a confident, critical, and secure manner.

[1] https://forms.gle/xTcnzE6z g3WpuR5M7
[2] https://publications.jrc.ec.europa.eu/repository/handle/JRC128415

Digital Skills

In measurements of the digital skills of the respondents, we adapt and apply to the current sample `The Youth Digital Skills Indicator` scale, each of the 5 domains of digital competencies —Information and Data Management (IDM), Communication and Collaboration (CC), Digital Content Creation (DC), Security (S), and Problem-solving (PS)—was assessed using a Likert-type scale (0-6), ranging from "Not at all true of me" to "Very true of me."

A Likert scale (0-5) was used to measure the frequency of students' **Online class attendance (OCS)** during the Covid-19 pandemic. The items asked respondents to indicate their level of agreement or disagreement with statements related to their attendance and participation in classes: Very often - Quite often - Sometimes – Rarely - Very rarely.

To assess students' self-perceived effectiveness of the educational process facilitated by **Face-to-Face Interaction (FFI**) with teachers and the availability of seeking guidance from teachers **(PAT),** a Likert scale ranging from 0 to 5 was utilized.

Results

The level of digital skills

Our results indicate that the highest digital competence area is ”Digital content creation” (M 3.89, SD = .92) and the lowest is ”Problem-solving” (M= 2.31, SD= .45). This result suggests a higher level of creativity among females participants, as they are capable of a more diverse use of digital devices to facilitate the creation of innovative and engaging digital content. Likewise, the outcome might suggest an increased online activity among girls on social media platforms, potentially contributing to a deeper comprehension of the quality criteria associated with digital content and the prerequisites for its widespread consumption. Enhanced proficiency in digital content creation fosters opportunities for competitiveness and personal as well as educational advancement

Additionally, respondents were asked about their preferred mode of deploying the teaching and learning process in the current context. In this regard a correlation between one of the methods indicated by the children as preferred, namely: face-to-face discussion with the teacher, and the mean scores from the yDSI was identified ($r(1482) = .20$, $p = .00$) mediated by the variable "the possibility to ask the teacher when I did not understand something". This aspect highlights the teacher's function as a guide and intermediary in the education process, with physical interaction between

teachers and students being a participatory factor in developing and improving digital skills.

Table 1. Descriptive Item Statistics (N = 1526)

	Max	Mean	Std. Deviation
Digital Skills (yDSI)	4.60	3.40	.71
Digital content creation (DC)	5.00	3.89	.92
Problem-solving (PS)	3.00	2.31	.45
Online classes attendance (OCS)	4.00	3.49	.83
The possibility to ask the teacher (PAT)	3.00	2.63	.58
Face to Face Interaction (FFI)	3.00	2.48	.612

Source: Data generated by the author

Except the correlation between PAT and OCS, all investigated variables yield a positive significant correlation with one another (yDSI, DC, PS, OCS, PAT and FFI). The results of the correlation analyses can be consulted in Table 2. Further research concerning the digital safety competencies of boys are necessary, considering that lower scores in this area could suggest increased vulnerability to digital risks among male students.

Table 2 Correlational analysis between variables of interest

	DC	PS	OCS	PAT	Face to Face Interaction (FFI)
Digital Skills (yDSI)	.896**	.564**	.179**	.208**	.206**
Digital content creation (DC)		.399**	.148**	.204**	.209**
Problem-solving (PS)			.144**	.106**	.115**
Online classes attendance (OCS)				.026	.084**
The possibility to ask the teacher (PAT)					.481**

*Note: * p<.05, ** p<.01*
Source: Data generated by the author.

Despite numerous studies highlighting the influential role of gender in digital exclusion, recent research focused on economically developed or developing nations indicates an amelioration in this regard, suggesting a narrowing gender gap. The results of our study indicate that, within three categories: Information navigation and processing, Communication and Interaction, and Problem-solving, there are no statistically significant variations in digital competencies based on gender. However, notable differences were observed in the areas of "Digital content creation" [t(1425) = 4.20, p = .000] and "Safety" [t(1421) = 2.49, p = .000], where female students exhibited higher levels of digital proficiency (Bărbuţă, 2023). Contrary to the prevailing stereotype associating girls with lower digital competence, our sample indicates that girls performed equivalently to boys and, in certain aspects, even outperformed them, particularly in digital content creation and online safety skills.

Students' self-perception regarding the effectiveness of the educational process facilitated by (FFI) with teachers and the (PAT):

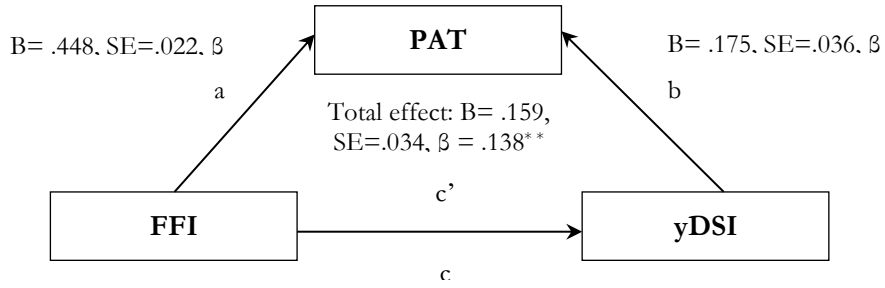
Regarding the level of student participation in online classes during the suspension of in-person classes, it was found that 64.3% of students reported attending all the classes they were notified about. However, 26.5% of students indicated that they only partially attended online classes, citing

restricted access to digital technologies as the main cause, their engagement has been diminished.

Mediation analyses indicate that the positive correlation found between FFI and yDSI is mediated by the variable PAT. To check if the variable of `The possibility to ask the teacher` (PAT) indeed mediates the relationship between Face to face-to-face interaction (FFI) and Digital Skills (yDSI), mediation models were conducted.

In the initial stage of the mediation model, there was a significant regression of FFI score with the yDSI, without considering the mediator (PAT), yielding b = .239, β =.206, t(1482) = 8.120, p = <.001. Subsequently, in Step 2, the regression of FFI on the mediator, PAT, was also noteworthy, with b = .448, β =.481, t(1421) = 20.662, p = <.001. Progressing to Step 3 of the mediation process, it was evident that the mediator (PAT), while controlling for FFI, remained significant, as indicated by b=.175, β =.141, t(1420) = 4.791, p = <.001. Moving on to Step 4, the analyses revealed that, after adjusting for the mediator (PAT), FFI scores remained a significant predictor of yDSI, with b = .159, β =.138, t(1420) = 4.699, p = <.001. A Sobel test was performed, indicating complete mediation in the model (z = 4.73, SE = 0.02, p = <.000). This test established that the PAT variable fully mediated the relationship between FFI and yDSI.

Figure 2. Path model diagram with results of the mediation analysis.



*Note: * p<.05, ** p<.01*
Source: Data generated by the author

Additional Sobel tests were conducted separately for two distinct groups within the sample. The first test was conducted to assess mediation exclusively among female respondents, revealing full mediation in the model (z = 3.03, SE = 0.02, p < .002). Similarly, when we conducted the analysis

exclusively on male participants in our sample, we also observed full mediation ($z = 3.32$, $SE = 0.02$, $p < .000$).

Learning seems to be easier when the teacher is physically present with the students, our results indicate that the mere presence is not enough, a certain level of interaction is also necessary. Children need to express their concerns about various issues that they do not understand and to receive answers in order to comprehend the subject taught. Without understanding the material, the learning process cannot be accomplished. We base the above-presented aspect on the mediation of the variable the possibility to ask the teacher when I did not understand something in the correlation between aspect yDSI and face-to-face discussion.

Discussions and conclusions

In short, our paper results highlight the teacher's role of guiding and moderating the education process, with physical interaction between teachers and students being a participatory factor in developing and improving digital skills. In essence, digital competence involves the expertise and abilities needed for an individual to utilize information and communication technology to achieve personal objectives in their personal or professional spheres. As a result, possessing digital competencies not only improves one's quality of life but also enhances the efficiency of their work (UNCTAD, 2023[3]). It's important to view digital competence not just as technical proficiency but as a broader concept encompassing cognitive and socio-emotional aspects of functioning in a digital setting.

The secondary digital gap denotes the uneven access to and skill level in digital technology among people of varying socioeconomic statuses. This divide can have a significant impact on educational opportunities and outcomes, as well as career paths. To ensure equal opportunity for success in the digital era, it is imperative to implement measures aimed at narrowing this gap, including enhancing technology access and delivering digital skills training to individuals.

The implementation of effective digital education strategies involves providing ongoing digital training for teaching staff, improving digital infrastructure to eliminate connectivity disparities, providing systematic and adaptable training opportunities for teachers to improve their expertise and abilities in online or hybrid environments, developing innovative digital educational tools, promoting the utilization of open educational resources, establishing collaboration among educational institutions and employees in

[3] For more information, refer to: https://unctad.org/tir2023

the creation of digital teaching materials, fostering public-private partnerships through participation in digital networks, both domestically and internationally, and facilitating the exchange of best practices on local, national, and international e-learning platforms such as SELFIE and e-Twinning.

The effective implementation of distance learning also requires ensuring equitable access to the necessary technology, such as tablets or PCs, for all students and teachers. Continual monitoring of vulnerable students and providing necessary support in collaboration with social services to ensure their uninterrupted access to quality education. Encouraging communication and active involvement of parents in supporting their children's education. Adopting and implementing the European Digital Competence Standards (DigComp) for citizens, teachers and educational institutions, implementing mandatory digital skills evaluation for high school students, creating a repository of open digital instructional materials, developing a "Digital Profile" for graduates of general education, it is essential to provide teachers with training in utilizing digital tools through collaborative, interdisciplinary, and innovative approaches. Furthermore, establishing basic requirements for equipping classrooms with necessary technology is essential to ensure the long-term incorporation of ICT into teaching and learning methodologies.

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