# Integrating ICT in Vocational Education and Training: Expectations, Challenges, and the Path towards Modernisation

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## Abstract

This paper examines the integration of Information and Communication Technology (ICT) in vocational education and training (VET) institutions, highlighting its significance in aligning education with the demands of a rapidly digitising world. The Council of the European Union recognises VET's role in equipping individuals with skills for digital and green transitions. Amid the COVID-19 pandemic, ICT adoption in education became imperative, accelerating the digital revolution within the sector. Albania, as an EU candidate country, has emphasised ICT in its national strategies, aligning with European frameworks to foster modernisation in VET. The research employs a quantitative methodology, utilising a questionnaire tailored to the Albanian VET context, to gather insights from public vocational schools and training centers, with a total number of n=46 institutions participating in the research. Findings reveal that VET institutions recognise ICT-supported modernisation as vital for improving teaching quality, management, communication, and students' transition to the labour market. Despite this, challenges such as inadequate infrastructure, outdated devices, and limited digital skills among teaching staff impede the full realisation of ICT's potential. To address these barriers, the study recommends targeted interventions, including teacher training and infrastructure development. This research contributes to the discourse on digital transformation in VET, underscoring the importance of strategic investments in ICT for enhancing vocational education's quality and relevance in Albania's evolving educational landscape.

Keywords: ICT, vocational education, teaching innovation, digital skills, educational modernization.

JEL Classification: I23; O33; O36.

#### Introduction

The Council of EU Recommendation on Vocational Education and Training (hereinafter VET) emphasizes that high-quality and innovative vocational education and training systems play a crucial role in equipping individuals with the necessary skills for employment, personal growth, and active citizenship. These skills are essential for individuals to effectively navigate the ever-changing world of work and contribute to the ongoing digital and green transitions, as well as to handle emergency situations and economic disruptions. Additionally, VET

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serves as a catalyst for fostering innovation, driving growth in sectors undergoing digital and green transformations, and meeting the demands of rapidly evolving occupations (Council of Europe, 2020).

As the digital world permeates work and societal spheres, educational systems and institutions increasingly acknowledge the opportunities and demands posed by this new reality and are reforming themselves to respond to the educational needs of new generations. VET institutions are closely linked to the digital world in various ways. Firstly, they play a crucial role in developing Information and Communication Technology (ICT) skills that are highly sought after in the job market. Additionally, these institutions can provide valuable content and technological resources to communities that have limited exposure to ICT. Furthermore, VET institutions can serve as platforms for promoting the critical, responsible, active, and creative use of technologies among students. Lastly, educational institutions contribute to familiarizing all stakeholders in the education sector with the digital landscape (Regional Center for Studies on the Development of the Information Society & UNESCO Institute for Statistics, 2018).

In 2020, as result of COVID pandemic UNESCO reported that schools were closed worldwide wide in 194 countries affecting 1.72 billion learners (UNESCO, 2020). During this period, teachers and students across the globe were 'forced' to engage in some forms of remote learning. Using technologies was conditional in a situation of lock down (Caro & Dragoshi, 2020). Tessema & Nicola-Gavrilă (2023) highlight the importance of evaluating higher education institutions' (HEIs) experiences with online learning, particularly given its widespread adoption during the COVID-19 pandemic. Such assessments offer critical insights into the effectiveness, challenges, and opportunities associated with online education in the higher education sector. This marked the start of the digital revolution in education and beyond.

Albania, as an EU Candidate Country, is dedicated to implementing the EU Council Recommendation on VET and the Osnabruck Declaration 2020 on vocational education and training (European Union, 2020). The emphasis on ICT-related investments, digital competences, and services in policy documents reflects Albania's recognition of the pivotal role that technology plays in modern society. By incorporating digital skills development across various sectors, including education, Albania seeks to equip its population with the necessary tools to thrive in a rapidly evolving digital landscape (Skills for Jobs, 2022).

This study delves into the expectations that VET institutions have regarding the integration of ICT in their operations, as well as the challenges they face in this transformative process.

Research questions:

Q1: What are the expectations of VET institutions regarding ICT-supported modernization?

Q2: Which are the main perceived challenges of VET institutions in Albania about ICT-supported modernization?

## 1. Literature Review

During the last decades, investment in ICT infrastructure, virtual learning platforms and teachers' capacitation has increased in Albania and other countries (Bešić-Vukašinović & Bešić, 2023; Ting, Manaig & Yazon, 2024). As highlighted by the Regional Cooperation Council's Balkan Barometer Business Opinion Report 2020 almost 80% of managers in the region stressed that digital skills are essential for conducting their business. Moreover, the report emphasizes the need of integrating digital skills into the education system (Andjelkovic et al., 2021). On the other hand, in Albania, an ETF report (European Training Foundation, 2018) claimed that among the main obstacles for the development of digital skills for students in VET schools was the lack of dedicated ICT teachers, while 77% of them reported needing training in using ICT for teaching purposes (European Training Foundation, 2018).

Also, a more recent OECD (2022) report indicated that beyond formal education Albania needs to support VET and emphasize work-based learning, especially in ICT companies. Furthermore, as recommended by the European Commission 2022 report, Albania should improve the professional development and training of teachers and trainers, with a specific focus on pedagogical skills related to the implementation of the competence-based inclusive approach and digitalization of from pre-primary to university level, including VET education (EC, 2022). Considering that ICT is among the fastest-growing sectors in Albania and has attracted foreign investors, this is a missed opportunity. In 2018, the ICT sector accounted for 2.9% of GDP (OECD, 2021). However, innovative firms in Albania face higher obstacles when searching for new employees, for both routine and non-routine tasks (World Bank, 2020).

The significance of integrating Information and Communication Technology (ICT) across various sectors, including education, is underscored in several key policy documents and action plans in Albania. The National Strategy for Employment and Skills 2030 places a strong emphasis on the digital transformation of the VET system, particularly under Strategic Objective 1.3 and Priority Measure 1.3.1. Additionally, the Osnabrück Declaration National Implementation Plan for Albania 2021-2025 highlights digitalization in VET, with Strategic Priority 4 focusing on the digital transformation of VET and employment, specifically targeting ICT-supported modernization of VET in Albania. The National Strategy for Education 2021-2026 also addresses digital competencies and ICT integration, notably through Objective A4, which aims to enhance digital competence by improving the use of ICT in teaching and learning. These national strategies align with the European Commission's broader strategy for development and digital integration, which seeks to promote extensive digitalization and optimize its application in Albania. Furthermore, the National Plan for European Integration proposes the establishment of an IT and Tourism Committee - comprising private sector representatives, experts, and relevant ministries - to monitor and address future challenges and opportunities in Vocational Education.

Currently, the status quo of vocational education and training in Albania, based on European Training Foundation report (2022) is:

- 36 public upper secondary VET schools offer three educational levels pertaining to Level 4<sup>th</sup> of Albanian Qualification Framework. Of them 5 VET schools offer post-secondary professional qualifications (AQF level 5) in fashion design, diagnostics and management in auto-service and real-estate in Vlora, Berat and Tirana.
- 10 public Vocational Training Centers offering unified vocational training programmes and other shortterm training to adults. The precondition for enrolment in a vocational training course is completion of basic education.
- 9 private Vocational Schools offering initial secondary VET and providing access to the labour market and higher education
- 112 private Training Centers offering mainly short-term vocational training for adults.

# 2. Research Methodology

For the purposes of this study a quantitative methodology was employed, having questionnaire as the main research tool. Survey is the best tool to grasp trends, perceptions, and factual information for the participant institutions. A questionnaire was drafted tailored to the Albanian context and preceded by a consultative process with some VET schools. This questionnaire underwent several review rounds from the research team and external researchers. The last version of the questionnaire was piloted in two schools in Tirana, reviewed further and finalized.

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The final sample of VET institutions included in the survey were all public training centers and vocational schools (Table 1). As seen there a total of 36 vocational schools were part of the study along with 10 Vocational Training Centers, a total of n=46 VET institutions. The completion of the questionnaire was done in groups from participant schools, comprising of the principal, the vice principal (s), ICT teachers, administrative staff and other relevant school staff.

Data processing was conducted in SPSS 26. Frequencies in percentages and means were used to understand expectations and challenges in relation to ICT-supported modernization.

This research had some methodological limitations, including reliance on self-reported data, which may introduce response bias, and a sample that may not fully represent the diversity of Albania's VET institutions. The structured questionnaire format limits nuanced responses. To mitigate these limitations the research team undertook several steps before and during the implementation of the fieldwork. The team prepared information materials on how to complete the questionnaire, it held two online meetings with the participant institutions to explain in detail the questionnaire and its nature and it requested from each institution to complete the questionnaire as a team, rather than one individual.

## 3. Results and Discussions

## 3.1. Expectations towards Innovative ICT-supported Modernization

Almost all VET institutions embraced the benefits of innovative ICT-supported modernization and expected that it will help them to tackle future challenges and (97.8%, n = 45), to aid internal and external communication (100%, n = 46), to improve teaching quality (97.8%, n = 45), and better manage internal procedures (97.8%, n = 45). Furthermore, they also considered ICT an important aspect of modernization (97.8%, n = 45) that contributes to VET institutions becoming more attractive for future students (95.6%, n = 44), and to be used in assessment of teaching and learning (93.4%, n = 43) and for research purposes (93.4%, n = 43), see Table 1.

When comparing public training centers to vocational schools, the results showed that schools had higher expectations about the benefits and positive contribution that ICT-supported modernization would have on them by as much as 20% difference. The two points with similar expectations were focused on the role of ICT-supported modernization in helping students' transit to labour market and in helping the administration of the institution to better manage internal procedures. When elaborating more on specific ideas about the potential benefits and expectations regarding ICT-supported modernization, the VET institutions emphasized that ICT could help them make the teaching and learning process more interactive and interesting for students by adding new sources of information for school subjects or by using multimedia (video) for teaching purposes. Moreover, ICT could help them promote the institution to future students. One VET institution stressed that ICT would help them improve their internal management system through a direct connection (or intranet) of school directory – teachers – secretary – finance – students. In this way the school staff and students can access all data in real time and improve their collaboration. Another institution went on elaborating on the ways online platforms can be used for blended learning, online assessments (formative and summative), internal and external communication and for the development of an online archive, that will eventually facilitate all internal school procedures (like access to school documentation, for school self-assessment procedures etc.), see Table 1 and Figure 1 associated.

## Table 1. Expectations towards ICT-supported modernization

	Disagree	Somewhat disagree	Somewhat agree	Agree	Strongly agree
Our institution would benefit from ICT – supported modernization in the coming 5 years to tackle future challenges (A)			2.2%	28.3%	69.6%
ICT will be an important aspect of modernization of the learning process in our institution (B)			2.2%	30.4%	67.4%
ICT will contribute to improving the teaching quality in the coming 5 years in our institution (C)			2.2%	32.6%	65.2%
ICT will help weak students in our institution to compensate the gaps of knowledge in the beginning of their study (D)	2.2%		40.0%	33.3%	24.4%
ICT will help to support our students in their transition into the labour market (E)			11.1%	42.2%	46.7%
ICT will help our students to meet the requirements of higher education (F)		4.5%	29.5%	29.5%	36.4%
ICT will help our institution in assessment of teaching and learning (G)			6.5%	39.1%	54.3%
ICT will help our communication with businesses to support practical learning (H)			21.7%	39.1%	39.1%
ICT will help our institution for research: research for information, of the labour market, assessment of parents/students/public perceptions towards vocational education etc. (I)		2.2%	2.2%	37.0%	58.7%
ICT will help our institution for internal and external communication for administrative and/or teaching purposes (J)				28.3%	71.7%
ICT will help our institution to become more attractive for future students (K)			4.3%	21.7%	73.9%
ICT will help the institution administration to better manage internal procedures (L)			2.2%	32.6%	65.2%

Figure 1 – Expectations towards ICT-supported modernization (associated with Table 1)

1.2



Disagree Somewhat disagree Somewhat agree Strongly agree

Referring to their expectations about the ways ICT-supported modernization will benefit students and communication with businesses, the participant institutions showed slightly less agreement. For example, 40% of them (n = 18 out of 45 VET institutions that answered this question) "somewhat agreed" to the suggestion that ICT will help weak students to compensate the gaps of knowledge they had in the beginning of their studies, and 29.5%

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(n = 13 out of 44) "somewhat agreed" that ICT will help their students to meet the requirements of higher education. In both cases, a small percentage of them disagreed, respectively 2.2% (n = 1) and 4.5% (n = 2). Only one VET institution argued in the following open question that by using ICT and making the learning process more interesting, the students will fill their gaps. On the other hand, it seems that they were more prone to perceive that ICT – supported solutions will help students in their transition to the labour market (88.9%, n = 40 out of 45).

Finally, facilitating communication with businesses in supporting practical learning was another benefit of ICT-supported modernization (100% agreement, with 21.7%, n = 10 of them agreeing partially).

## 3.2. Expected Challenges

The majority of the VET institutions agreed that they expect to face several challenges in terms of lack of physical infrastructure to support the ICT solutions (87%, n = 40), that the PCs are old and in need of repair (86.9%, n = 40) and fairly more that the students cannot afford the necessary devices for BYOD (bring your own device) solutions (95.7%, n = 44). Concerning the use of internet, 40% fully agreed (n = 18) and 26.1% somewhat agreed (n = 12) that they have problems with internet access. This percentage was greater in relation to low speed and low capacity for the number of users (58.7%, n = 27 fully agreed and 21.7%, n = 10 somewhat agreed, while the others disagreed). In line with this, they also confirmed problems with online platforms (47.8%, n = 12 fully agreed and 32.6%, n = 15 partially agreed), while more of them saw interactive tools as challenging (69.5%, n = 32 fully agreed and 15.2%, n = 7 partially agreed) in line with other researchers in this field (Hu, 2023), see Figure 2. By far, lack of physical infrastructure - of PCs, laptops or tablets - to use for ICT-supported modernization was the most prominent challenge that VET institutions faced, based on their explanations in a following open question. It is worth mentioning that in a VET school with ICT profile the last supply of PCs was in 2006.

## Figure 2. Challenges towards ICT-supported modernization - physical infrastructure



	Problems with interactive tools, e.g. Mentimeter, Kahoot etc.	Problems with online platforms, e.g. lack of online learning platforms.	Internet problems, like low speed, low capacity for users.	Lack of internet access.	Students cannot afford the necessary devices for BYOD solutions.	The school's PCs/laptops are old and/or need to be repaired.	Lack of physical infrastructure to support the ICT solutions for modernization (laptops, tablets, projectors or other).
Strongly disagree		6.5%	2.2%	8.7%			
Disagree	4.3%	4.3%	6.5%	10.9%			
Somewhat disagree	10.9%	8.7%	10.9%	15.2%	2.2%	0.0%	2.2%
Somewhat agree	15.2%	32.6%	21.7%	26.1%	2.2%	13.0%	10.9%
Agree	30.4%	26.1%	30.4%	21.7%	10.9%	15.2%	19.6%
Strongly agree	39.1%	21.7%	28.3%	17.4%	84.8%	71.7%	67.4%

The second batch of potential challenges for ICT-modernization addressed teachers and their motivation and skills. 45.7% (n = 21) of participant VET institutions fully agreed that teachers lack digital skills while 34.8% (n = 16) agreed partially; 42.3% (n = 19 out of 45) agreed that they that they lack the skills to prepare digital materials (31.1%, n = 14 somewhat agreed), 34.8% (n = 16) that they lack the time to use ICT in planning teaching hours (and another 34.8%, n = 16 somewhat agreed), and slightly less are not enough motivated to use ICT-supported solutions (32.7%, n = 15 fully agreed and 34.8% somewhat agreed, n = 16). It is worth highlighting that only 11.1% (n = 5 out of 45) fully agreed that teachers lack the will to include blended learning in their teaching plans (40%, n = 18 partially agreed). To add to these challenges, lack of technical support from dedicated IT staff (60.9%, n = 28 fully agreed) and of pedagogical support for the use of ICT in teaching hours (48.9%, n = 22 fully agreed) was prevalent (Table 3).

	Strongly	Disagroo	Somewhat	Somewhat	Agree	Strongly
	disagree	Disagree	disagree	agree		agree
Lack of digital skills of the teaching staff.		4.3%	15.2%	34.8%	37.0%	8.7%
Insufficient pedagogical support for the use of ICT	2.2%		17.8%	31.1%	37.8%	11 1%
in teaching hours.	2.270		11.070	01.170	07.070	11.170
Insufficient technical support for teachers.		2.2%	13.0%	23.9%	43.5%	17.4%
Lack of skills of teachers to prepare digital		8 0%	20.0%	28.0%	35.6%	6.7%
materials.		0.370	20.070	20.370	55.070	0.7 /0
Limited use of technology during teaching due to						
the lack of time of teachers for planning teaching	2.2%	13.0%	15.2%	34.8%	23.9%	10.9%
hours.						
Low motivation for the major part of the teachers to	6.5%	6.5%	19.6%	34.8%	28.3%	4.3%
use ICT – supported solutions.	0.570					
Lack of will from the teachers to include blended	11 1%	15.6%	22.2%	40.0%	8.9%	2.2%
learning in lesson plans.	11.170					

Table 3. Expected challenges towards ICT-supported modernization - teacher's skills, capacities and motivation

# Conclusions

The participant VET institutions expected ICT-supported modernization to contribute greatly to facing future challenges, improving internal and external communication and management procedures, teaching and assessment processes and research. They considered it equally beneficial for the students' transition to labour market. When it comes to knowledge gaps, meeting the requirements of higher education or in supporting practical learning through communication with businesses it seems that they see ICT-supported modernization as slightly less beneficial. Expected infrastructural challenges permeated VET institutions and prevailed among the different types of concerns. Teachers' motivation towards the use of ICT-supported solutions was hampered by the lack of physical infrastructure, lack of technical and pedagogical support and lack of sustainable online learning platforms. In any case, VET institutions had a clear perception about the rightful importance of ICT modernization for a qualitative VET.

## Credit Authorship Contribution Statement

Duci, V. contributed to the article by developing the developing the literature review, methodology and findings, with contributions from the co-authors. The author's contribution was in establishing the research context, integrating relevant literature, and formulating the study's methodological approach. Çaro, E. contributed to the article by providing input in the

contextualization, literature review, and methodology sections of the paper. Kapllanaj, M. contributed to methodology and instrument development and contributed to methodological approach results and discussion analysis.

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#### Conflict of Interest Statement

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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# Annex 1.

# Table 3. VET institutions part of the study

Public Vocational Schools	Public Vocational training centers
1. Vocational School "Fan Noli"	<ol> <li>Regional Directory for the Provision of Vocational Training (RDPVT) for the North-Eastern area</li> </ol>
2. Vocational School "Hermann Gmeiner"	2. RDPVT Durres
3. Construction School "Karl Gega"	3. RDPVT Elbasan
4. Vocational School "Hysen Çela"	4. RDPVT Shkoder
5. Vocational School "Irakli Terova",Korce	5. RDPVT Vlore
6. Vocational School "Kolin Gjoka", Lezhe	6. RDPVT Korce
7. Vocational School "Ndre Mjeda"	7. RDPVT 4
8. Vocational School "Petro Sota"	8. RDPVT Fier
9. Vocational School "Rakim Kryeziu", Fier	9. RDPVT Gjirokaster
10. Vocational School "Hamdi Bushati"	10. RDPVT Nr 1 Tirane
11. Vocational School "Mihal Shahini" Cerrik	
12. Vocational School in Kamez	
13. Vocational School "Havzi Nela", Kukes	
14. Vocational School in Hospitality and Tourism	
15. Vocational Industrial School "Pavarësia" Vlorë	
16. Vocational Industrial School in Rubik	
17. Vocational School "Isuf Gjata"	
18. Vocational Mechanical and Agricultural School in Lushnja	
19. Vocational School "Beqir Cela", Durres	
20. Vocational School "Kristo Isak"	
21. Vocational School "Thoma Papapano"	
22. Vocational School "26 Marsi"	
23. Vocational School on Building, Korce	
24. Vocational School "Salih Ceka"	
25. Vocational Technical and Electrical School "Gjergji Canco"	
26. Vocational Technical Forestry School "Kolë Margjini"	
27. Vocational Technical School "Enver Qiraxhi"	
28. Economic Technical School, Tirana	
29. Vocational School "Stiliano Bandilli"	
30. Vocational Commercial School	
31. Vocational School on Agrobusiness, Golem	
32. Vocational School "Ali Myftiu", Elbasan	
33. Vocational School "Antoni Athanas", Sarande	
34. Vocational School "Arben Broci"	
35. Vocational School "Demir Progri"	
36. Vocational school "Nazmi Rushiti"	