

Obstacles to the use of digital solutions in VET from the trainers' point of view

A study among VET teachers in the city of Jijel

معيقات استخدام الحلول الرقمية في التكوين والتعليم المهنيين من وجهة نظر المكونين

دراسة على عينة من أساتذة التكوين والتعليم المهنيين في مدينة جيجل

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Abstract:

This study aims to identify the obstacles to the use of digital solutions in vocational education and training VET, from the point of view of trainers in public vocational education and training institutions in the city of Jijel. The study was applied to a sample of 40 VET teachers distributed among four training institutions in the city, the sample was selected at random. The researchers used the questionnaire method to collect data, that was analyzed using the SPSS program to calculate means and standard deviations. The study found that there is agreement among sample members on the importance of using digital solutions, but there is a negative trend among trainers to use digital solutions in VET. The most obstacles that stand before them are: weak internet lines for trainers and trainees, and the majority of trainers have not received the proper support and training to begin training using digital solutions.

Keys words:

vocational training, vocational education, vocational education and training institutions, digital solutions

JEL classification codes : I ; I2 ; I21

ملخص:

تهدف هذه الدراسة إلى التعرف على معيقات استخدام الحلول الرقمية في التكوين والتعليم المهنيين من وجهة نظر المكونين العاملين بمؤسسات التكوين والتعليم المهنيين العمومية في مدينة جيجل، وقد طبقت الدراسة على عينة مكونة من 40 أستاذ تكوين وتعليم مهنيين موزعين على المؤسسات التكوينية الأربعة الموجودة في المدينة، حيث تم اختيار العينة بطريقة عشوائية، واستخدم الباحثان طريقة الاستبيان لجمع البيانات المتعلقة بالدراسة. والتي تم تحليلها باستخدام البرنامج الإحصائي SPSS لحساب المتوسطات الحسابية والانحرافات المعيارية. وقد توصلت الدراسة إلى أن هناك اتفاق بين أفراد عينة الدراسة على أهمية استخدام الحلول الرقمية، ولكن هناك اتجاه سلبي لدى المكونين لتطبيق الحلول الرقمية في التكوين والتعليم المهنيين، كما أن أهم المعوقات التي تواجههم في استخدام هذه الحلول هي: ضعف خطوط الانترنت للمكونين والمتكويين، وعدم تلقي غالبية المكونين للدعم والتدريب المناسبين لمباشرة التكوين باستخدام الحلول الرقمية.

الكلمات المفتاحية: تكوين مهني، تعليم مهني، مؤسسات التكوين والتعليم المهنيين، الحلول الرقمية

تصنيف JEL: I, I2, I21

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1-Introduction

On March 12, 2020, Algeria, like all countries in the world, closed schools, universities, institutes and vocational education and training centers, and imposed a partial quarantine, to try to deal with the spread of the Corona virus. But the suspension of studies at all levels and for a long period and confinement at home will certainly have a negative impact, especially if it does not offer students, pupils and trainees the opportunity to learn at home or online. For these reasons, educational institutions in developed countries have turned to online learning and the use of digital solutions in education as a solution to the crisis of closure of schools, universities and training institutions. This allows pupils and students to follow their courses online using adapted digital solutions. These solutions, although adopted in certain developing countries such as Algeria, the trainers have tried to find solutions to the problem by resorting to available digital solutions, such as sending courses by email, the platforms made available and social networks. But it was not easy, especially since the experience was instantaneous and new for most of the trainers, and even. after these years and the lifting of restrictions linked to the Corona pandemic, and despite the availability infrastructure and a clear commitment from the competent authorities, including the Ministry of Vocational Training and Education. Despite the opportunities these solutions offer to learners, such as access to a large quantity of information within a timely faster than paper documents (Ferone, principalli, & Crinon, 2016, p. 366). The use of digital solutions in VET has not improved.

Problem of the study : In light of the above, this study attempted to answer the following question : what are the obstacles that trainers encounter when using digital solutions in VET ?

The objective of this study is to clarify the position of trainers regarding the use of digital solutions in VET, to highlight the most important obstacles they face when using them.

2-Review of literature

2.1. Vocational training: It is a group of activities that aim to provide to the trainee with knowledge, skills, and behaviors that they obtain in vocational education and training institutions (VETI) through theoretical lessons and applied work that make him able to practice a profession. This training process is global and includes psychological, technical, and social aspects (Tichabet & Mezaour, 2019, p. 1119).

2.2. Vocational education: is considered a new form or a new educational and vocational route, created as part of the reform of the national education and

training system in 2002. It is generally intended for students who develop a penchant for manual work, who aspire to short-term courses and to exercise a profession just at the end of their training (Hamza, 2019, p. 1807). According to Article 10 of the Law 87/2008, vocational education is “all forms of qualified academic education provided by vocational educational institutions after the compulsory course of educational institutions. It is directed to preparing or applying a profession or group of professions. It is of two types: Peaceful education whose goal is to acquire scientific culture.” which develops professional competencies and technical education allows the development of professional competencies.

2.3. Vocational education and training institutions VETI: Vocational education and training institutions are public administrative establishments with legal personality and financial autonomy. Created by decree on the proposal of the minister responsible for vocational education and training, and placed under his supervision. We distinguish the vocational education institutes «Institut d'éducation professionnelle IEP» intended to provide vocational education (Décret exécutif n 08-293 fixant le statut-type des IEP, 2008), national institute specialized in vocational training «institut national spécialisé de formation professionnelle INSFP» responsible for training higher technicians, level 5 (Décret exécutif n 12-125 fixant le statut-type des INSFP, 2012), vocational training and apprenticeship center «centre de formation professionnelle et d'Apprentissage CFPA» which forms levels 1 to 4 (Décret exécutif n 14-140 fixant le statut-type des CFPA, 2014), Specialized vocational training and apprenticeship centers for physically disabled people «centres de formation professionnelle et de l'apprentissage spécialisés pour personnes handicapées physiques CFPASHP» (Décret exécutif n 16-184 fixant les missions et les modalités d'organisation et de fonctionnement des centres de formation professionnelle et de l'apprentissage spécialisés pour personnes handicapées physiques, 2016), plus the INSFP and CFPA annexes.

2.4. Digital solutions for VET: Digital solutions make it possible to meet a double challenge: quantitative and qualitative, particularly in the sector of VET, which constitutes an essential bond linking education and integration into the labor market.

First, digital technology allows better management of public policies in the sector and a rapid response to the expectations of the local labor market. Secondly, by broadening the scope of education and training, while improving

its quality, reducing training costs and time and increasing the information retention rate (Huet, Ploen, & Rieux, 2022).

There are many digital solutions used in education and training. Many companies and organizations in various countries around the world, including Algeria, have been keen on using them directly or after having adapted them according to their needs in education and training, during and after the Corona virus pandemic.

The advent of the personal computer in the 1980s and the widespread use of devices marked the start of a new wave of computer-based training and education, using color screens, larger data carriers and tools for creating and developing online or offline learning programs, such as digital documents which are important for teachers to share resources (readings or presentations) and help students understand key concepts. Educational software that facilitates learning and working online or offline; can be used in a traditional classroom, in addition to online courses. Then appeared the Internet and the World Wide Web, which have promoted the digitalization of training and teaching since 1990. They initially made it possible to communicate an increase the quantity of data to several recipients. Then to communicate in two-ways, audio and video. Then comes streaming video data, online chat and forums and video conferencing (Niegemann, 2020, p. 16), as well as as Massive Open Online Course MOOC courses (Kögler, Egloffstein, & Schönberger, 2020, p. 205).

With the emergence of laptops and netbooks since the 1990s, then smartphones since 2007 and tablets since 2010 (Siegfried & Hermkes, 2020), education through the use of mobile devices has become a trend (Niegemann, 2020, p. 17).

3- Method:

Methodological procedures of the study include the population and sample studied, the spatial and temporal limits and study tools.

3.1. Study population and sample: This field study was conducted from April 30 to May 25, 2023, in vocational training and education institutions in the city of Jijel.

A questionnaire was distributed to a sample of 50 individuals from a population of 90 individuals, which represents 55.55% of the study population. The random sampling method was used, and after retrieving and unpacking the questionnaires, it became clear that ten questionnaires were invalid, and they were excluded, and 40 were accepted. The questionnaire represents 44.44% of the study population, and the following table shows the accepted study sample.

Table 1. Study population and sample

	Vocabulary	Ratio
Study population	90	100%
Target sample 50	50	55.55%
Excluded vocabulary	10	11.11%
Real sample	40	44.44%

Source: produced by the authors

The following table shows the distribution of the study population and sample in terms of gender and work institution:

Table 2. Distribution of the study population

	study population		Sample			
	Total	%	Females	Males	Total	%
CFPA for boy	24	26.66	04	07	11	27.5
CFPA for girl	25	27.77	06	05	11	27.5
INSFP	26	28.88	08	01	09	22.5
IEP	15	16.66	07	02	09	22.5
Total	90	100	25	15	40	100

Source: produced by the authors

3.2. Study tools: In order to conduct the study, a questionnaire was developed to collect primary data on the variables of the study, based on the problem and hypotheses of the study. The process went through the following stages:

- Preparing the questions: The questions were formulated in a simple way, away from complexity, so that they would be understood by all members of the study sample. As for the selection of the questions, they were based on interviews conducted with ten trainers (four from CFPA for Girls, four from CFPA for boy and two from INSFP), where open questions were asked about three axes: possession of the means that allow the use of digital solutions in VET,

Title: Obstacles to the use of digital solutions in VET from the trainers' point of..

familiarization of trainers with digital solutions available in VET, and the last question about the Personal experience of trainers with the use of digital solutions in VET.

- Determining the questionnaire's axes: The questionnaire was divided into four axes:

The first axis is tilted "Personal data of the study sample members in terms of age, gender, marital status, educational level, highest degree, position, experience, employment institution, and teacher's specialization in VET".

The second axis is tilted "possession of the means that allow the use of digital solutions in VET" (04 questions).

The third axis is tilted "familiarization of trainers with digital solutions available in VET" (06 questions).

The fourth axis is tilted "personal experience of trainers with the use of digital solutions in VET" (06 questions).

- Reviewing the network of questions: The network of questions was presented to four specialized trainers in order to express their comments, and they agreed to rearrange and distribute the questions according to importance.

In order to reach the results of the study, statistical methods were used by measuring arithmetic means and standard deviation. In this study, the tripartite Likert scale of agree, neutral, and disagree was used, where the weighted average is calculated in the following way: $\text{Category length} = (\text{highest value} - \text{lowest value}) / \text{number of values in the scale} = (3-1) / 3 = 0.66$. Values between 1 - 1.66 are weak, between 1.67 - 2.33 are average, and between 2.34 - 3 are high.

3.3. Reliability : The reliability of the study tool was measured using the SPSS program by extracting the Cronbach's Alpha reliability coefficient to ensure that the same results would be obtained and that no error would occur in the data if the same study was repeated using the same study tool and in the same conditions. The value of the Cronbach's Alpha coefficient was 0.674, which is a value above the minimum. The acceptable value is 0.600 to judge the reliability of the study tool.

Table 3. Construct validity of the tool

Cronbach's alpha	frequencies
0.674	15

Source: produced by the authors

4-Result:

After transcribing and analyzing the valid forms, the results were as follows:

4.1. Characteristics of the basic sample: Characteristics of the basic sample are expressed in the following table:

Table 4. Basic sample characteristics

	Levels	Number	Percentage
Age	less than 31	01	02.5
	31- 40	20	50
	41- 50	14	35
	Above 51	05	12.5
Gender	Male	15	37.5
	Female	25	62.5
Marital status	Single	07	17.5
	Married	33	82.5
Education level	less than secondary	01	02.5
	Secondary	11	27.5
	University	26	65
	Other	02	05
Certificate	Technical/Senior Technician	08	20
	Baccalaureate	07	17.5
	Bachelor/DEUA	06	15
	Master	09	22.5
	Engineer	10	25
Professional	less than 5 years	11	27.5

Title: Obstacles to the use of digital solutions in VET from the trainers' point of..

experience			
	05- 10	14	35
	11- 20	09	22.5
	More than 20	06	15
Labor institution			
	CFPA of boy	11	27.5
	CFPA of girl	11	27.5
	INSFP	09	22.5
	IEP	09	22.5
Teacher specialty			
	traditional crafts	01	02.5
	Wood and furniture	03	07.5
	Construction and public works	05	12.5
	Industrial Chemistry and Plastics	01	02.5
	Electricity, electronics and energy	04	10
	Hotel, catering and tourism	04	10
	Food industries	01	02.5
	Computing, digitization and communications	09	22.5
	Service professions	01	02.5
	Engine Mechanics	01	02.5
	Administration and management	04	10
	Construction and public	10	19.2

works		
Textile and clothing	02	05
Languages	04	10

Source: produced by the authors

It is clear from the table that the age group from 31 to 40 years is the most represented with 20 individuals and a percentage of 50%, followed by the group from 41 to 50 years with 14 individuals and a percentage of 35%, then the group over 51 years old with five individuals and a percentage of 12.5%, and finally the group under 31 years old with one person, representing 02.5%, while the total sample of individuals under 50 years old was of 35 individuals, or 87.5%.

These figures reflect the result of the rejuvenation processes undertaken by the VET sector since the start of the millennium.

Regarding gender, the table shows that the number of women is greater, since the sample included 25 individuals, or 62.5% women, compared to 15 individuals, or 37.5% men, which reflects the extent of women's involvement in VET.

Concerning marital status, the majority of members of the sample are married, with 33 people, or 82.5%, compared to 7 singles, or 17.5%, which is an indicator of family stability.

Concerning the level of education, it appears from the table that those who have a university level represent the majority of the sample, with 26 individuals, or 65%, followed by those who have a secondary level, with 11 individuals, with a percentage of 27.5%, then the other category (low level of education), with two individuals, and a percentage of 03.8%, and finally those with a less than secondary education by one person, i.e. 02.5 %. This reflects, on the one hand, the high level of education of VET trainers, and on the other hand, the growing tendency of holders of university degrees to work in the VET sector, in accordance with the policy pursued by the ministry of training and vocational education.

As for diplomas, it appears from the table that the other category (holders of a state engineering certificate) is represented by 10 individuals and a percentage of 25%, followed by holders of a master's degree with 9 individuals and percentage of 22.5%, technicians and senior technicians with 08 individuals and a percentage of 20%, then holders of a baccalaureate with 07 individuals, representing 17.5%, and finally holders of bachelors and DEUA, 06 individuals,

Title: Obstacles to the use of digital solutions in VET from the trainers' point of..

representing 15%. These figures demonstrate the high level of education of trainers, since baccalaureate holders are represented by 32 individuals, representing 80% of the sample.

Concerning professional experience, it appears from the table that the category between 5 and 10 years is represented by 14 individuals and a percentage of 35%, followed by the category of less than 5 years with 11 individuals and a percentage of 27.5%. , then the category between 11 and 20 years old with 9 individuals and a percentage of 22.5%, and finally we find a category over 20 years old with 6 individuals, or 15%, which reflects the process of rejuvenation of the sector of the VET, where those with less than ten years of experience reached 25 individuals, or 62% of the sample.

Regarding the work institution, it turns out that individuals work in the CFPA for girls and the CFPA for boys are represented by 11 individuals, at a rate of 27.5% for each one, while individuals working in the INSFP and the IEP are represented by 09 individuals, at a rate of 22.5% for each one, thus the individuals working in a CFPA are largely represented, with 22 individuals, at a rate of 55%, and the individuals who work in a vocational training institutions (center or institute) represent the majority of the sample with 31 individuals, at a rate of 77.5%, compared to 9 individuals working in a vocational education institution, at a rate of 22.5 %, which reflects the real presence and size of training institutions in the city of Jijel (two CFPAs, one INSFP and one IEP).

Concerning the specialties taught, it appears from the table that the Computing, digitization and communications section (INT) is represented by 9 individuals, representing 22.5% of the sample, followed by 05 individuals from the Building and Public Works section (BTP), which represents 12.5%, followed by the Electricity, Electronics and Energy (ELE), Hospitality, Catering and Tourism (HRT), Administrative and Management Techniques (TAG), and Languages sections, with 04 individuals and 10% for each one, then come the Wood and Furniture section (BAM) with 03 individuals and 07.5%, then the Textile and Clothing section (THC) with 2 individuals and 05%, and finally the sections of Traditional Crafts (ART), Industrial Chemistry and Plastics (CIP), Agri-Food Industries (IAA), Service Professions (MS), Mechanics of engines and mechanisms (MME) with one individual, and at the rate of 02.5%. These figures are explained by the new orientation of the MFEP, which included digitalization, IT, telecommunications, as priorities in training, since these specialties do not require work tools.

4.2. Possession of the means that allow the use of digital solutions in VET:

An analysis of the possession of the means that allow the use of digital solutions in VET showed the following results:

Table 5. Possession of the means that allow the use of digital solutions in VET

Items	Arithmetic mean	standard deviation	
01 I have devices that allow connection to the Internet	2.2500	0.98058	Average
02 I have an internet key for personal use	2.0500	1.01147	Average
03 I renew my subscription every month	2.7500	0.63043	High
04 The institution where I work provides devices that facilitate the digital VET	1.6750	0.85896	Average
The first axis	2.1813	0.57732	Average

Source: produced by the authors

We note from the table that the highest average was 2.7500 and a standard deviation of 0.63043 in the third statement, and the lowest average was 1.6750 and a standard deviation of 0.85896 in the fourth statement. The average of the first axis was 2.1813 and a standard deviation of 0.57732, while we note that most of the arithmetic averages are in the average category.

4.3. Familiarization of trainers with digital solutions available in VET: The following table shows to what extent the members of the sample are aware of the availability of the digital solutions in VET.

Table 6. Possession of the means that allow the use of digital solutions in VET

Items	Arithmetic mean	Standard deviation	
05 I know that digital solutions are available in the VET	2.4000	0.92819	High
06 I know digital solutions that the MFEP has made available to trainers	1.9250	0.94428	Average
07 The establishment where I work has provided us with digital solutions	1.3750	0.70484	Weak

Title: Obstacles to the use of digital solutions in VET from the trainers' point of..

	allowing VET in person and remotely			
08	I find that social networks are good solutions for VET	2.2750	0.87669	Average
09	I find that the “Dourousse” platform is an easy digital solution for the VET	1.6250	0.83781	Weak
	The second axis	1.9200	0.49365	average

Source: produced by the authors

We notice from the table that the highest average was 2.4000 and a standard deviation of 0.92819 in the fifth statement, and the lowest average was 1.2500 and a standard deviation of 0.63043 in the tenth statement. The average of the first axis was 1.8083 and a standard deviation of 0.43289, while we note that most of the arithmetic averages are in the weak category.

4.4. Personal experience of trainers with the use of digital solutions in VET:

An analysis of the Personal experience of trainers with the use of digital solutions in VET showed the following results.

Table 7. Personal experience of trainers with the use of digital solutions in VET

	Items	Arithmetic mean	Standard deviation	
10	the establishment organized a teaching session using digital solutions	2.3750	0.86787	High
11	The specialty that I teach allows the use of digital solutions	1.3750	0.74032	Weak
12	I have already used digital solutions to deliver my courses	1.9000	0.95542	Average
13	My ability to use digital solutions in VET is good	1.8750	0.82236	average
14	I need training on the use of digital solutions in VET	1.8750	0.82236	Average
15	I encountered several problems in preparing and delivering courses with	2.5000	0.81650	High

digital solutions

The third axis	1.9833	0.46654	average
Total axes	1.9910	0.35852	Average

Source: produced by the authors

We notice from the table that the highest mean was 2.5000 and a standard deviation of 0.81650 in statement 14, and the lowest mean was 1.3750 and a standard deviation of 0.74032 in statement 11. The mean of the third axis was 1.9833 and a standard deviation of 0.46654, while we see that most of the arithmetic means are in the average category. The mean of the three axes was 2.0282, with a standard deviation of 0.37007. While the arithmetic averages of the three axes are of the average category.

5- Discussion:

After transcribing and analyzing the data, the study arrived at the following results:

Vocational and education training institutions in the city of Jijel have equipment and Internet connections allowing digital training. However, the use of digital solutions in VET remains low, despite the efforts made and the significant sums spent by the State through the MFEP (Būshaykhī, 2019, p. 174), in order to provide digital solutions to public VET Institutions, and to connect them to the Internet and internal networks to provide and facilitate the flow of information and improve training, and reason is due to the lack and obsolescence of resources available in these establishments, in addition to low Internet speed and frequent interruptions, which is consistent with the study of (Gouzi & Mazar, 2020).

Despite the availability of means of communication among trainers and their high academic level (the majority of them are university graduates), and the possibility of using digital solutions in their specialties for VET, their use remains low, and the reasons given are: their lack of knowledge that the digital solutions are available and their lack of experience in the field. It is obvious that the trainers were not directed by the administration nor did they take the initiative to try to use the digital solutions available in the VET, which is consistent with the study carried out by (Kaddeche, Manaa, & Kaddeche, 2021).

Regarding access to digital solutions, most of those interviewed admitted knowing that digital solutions are available in the VET, despite their disagreement on the solutions developed by the MFEP. There is also consensus

among respondents that their institutions have not provided appropriate digital solutions to achieve VET (Kaddeche, Manaa, & Kaddeche, 2021). Regarding social networks, respondents believe that they can represent an acceptable solution for conducting training and communicating information between trainees, trainers and administration, unlike the “dourousse” course platform, specifically designed to be the link between trainees and trainers, which did not receive responsiveness from trainees and trainers. Regarding training using digital solutions, respondents admitted that they had already provided training using one of the available digital solutions, but only during the Corona virus period and at the request from the administration, because the majority of them do not see the need to use digital solutions in their specialties. Most of the respondents did not try to improve their abilities to use digital solutions and solutions available in VET and were content with what they knew about using email and social networks. As for the need for training in the use of digital solutions, the majority of respondents expressed their need for training in the use of digital solutions in order to use them optimally in VET, which was noted by the study by (Khaldi, 2013).

Concerning the existence of difficulties in using digital solutions in VET, a certain number of respondents recognized the existence of difficulties which are: In addition to the lack and obsolescence of the means available to VET, and the low flow of Internet, the majority of trainees not being connected to the network, and the difficulty trainers find in choosing the appropriate solution, which is indicated in the study of (Gouzi & Mazar, 2020), and (Kaddeche, Manaa, & Kaddeche, 2021).

8- Conclusion:

In light of the above, the study concludes with the following results:

- Despite the efforts made by the State through the Algerian Ministry of Vocational Training and Education to provide public training institutions with digital means and solutions and connect them to the Internet and Intranet to facilitate the dissemination of information and improve training, the study showed that the means and equipment are not sufficiently available in VET institutions. There is a significant lack in the provision of means and Internet lines for trainers and trainees. Which constitutes an obstacle to the use of digital solutions in VET.
- The majority of teacher trainers in the institutions studied did not commit to preparing and delivering courses using digital solutions, only during the Corona virus crisis and at the request of the administration and only during the pandemic. After this, the trainers no longer thought about using them.

- There is a negative trend among trainers towards the use of digital solutions, even if the majority of them agree on the importance of these solutions and benefiting from them in VET.
- The majority of trainers have not benefited from training in the field of information and communication technologies and the use of digital solutions, and they face many difficulties when trying to use them in the VET.

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