

Humanities and Cultural Studies

ISSN 2557-8972

2022, vol. 3, no. 2, p. 79–99

DOI: 10.55225/hcs.410

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Digital readiness of VET¹ school

Abstract

The notion of digital readiness has been attracting more attention in the area of education. It has been caused by the recent shift in educational practices caused by the COVID-19 pandemic. The paper aims to define and investigate the digital readiness of VET schools for digitising teaching, distinguishing areas which need to be supported with additional tools and methodology in the future. To this end, a current situation regarding problems encountered at selected secondary vocational schools was analysed. The paper summarises a study carried out among secondary school teachers in five countries, probing their attitudes and gathering their experiences. It looks into both the technicalities of the educational process (e.g. quality of hardware, reliability of the Internet connection, access to educational software) and the skills involved (e.g. using educational software, the ability to access and adapt online / digital resources, the capacity to introduce new pedagogies and strategies or adapt existing ones). It appeared that the problem areas identified in the process of the

¹ VET – Vocational Education and Training. The article was created on the basis of research carried out as part of an Erasmus+ project IDEA – Innovative Digital Education Approach (project number: 2020-1-M K01-KA226-VET-094564). The authors would like to thank the following contributors from project partner institutions: Dariusz Dudzik, Ana Rita Alves Ferreira, Cesar Garrion, Ignacio Segui, Hristijan Jordanoski, Irena Pipidjanoska, Biljana Trajkoska, Marjan Namumoski, Pedro Eduardo Gasal Pereira, Nuno Almeida Ribeiro, Simona Stoica, Michaela Capatina, Eleny Cojocar.

Informacja o artykule / Article Information

Otrzymano (Received): 22.06.2022 • Przyjęto do druku (Accepted): 24.06.2022 • Opublikowano (Published): Czerwiec (July) 2022

study were country depended. However, the most frequently mentioned problems, such as lack of tools that motivate and autonomise students or issues with the hardware and broadband, were shared by teachers from the majority of the partner countries.

Keywords

e-learning, digital readiness, readiness for autonomy

Introduction

E-learning is an educational technique gaining popularity in current educational practice. The implementation of e-learning has been carried out in multiple forms of education and types of institutions. It has also proliferated within corporate and professional training. The importance of e-learning has led to the need in assessing the preparation of the users before using the on-line environment. Therefore, e-learning readiness is assessed, making sure users are capable of operating the technology in the best way possible.¹ Technically speaking, e-learning readiness is the capability of prospective e-learning teachers / trainers and users in using a new learning and teaching environment, as well as alternative educational technologies.

In the field of education, the concept of readiness could be explored through paradigms of learning: behaviourism, cognitivism, and constructivism. Each paradigm, or set of perspectives on learning, offers a slightly different view on learning readiness. Cognitivism addresses how information is received, organised, stored, and retrieved by the mind,² so emphasis will be placed on the cognitive processes underlying the capacity to implement and use e-learning. The concept of readiness, when viewed as a mental process, requires the user to be mentally active. It is during that process that knowledge is constructed and reconstructed in the mind of the users of technology, which forms the essence of constructivism. To construct knowledge, the user (both the learner and the teacher) must act on learning objects, and, according to constructivists, it is this action that affords familiarity with them.³

The changing nature of learning, due to technological and pedagogical advances, compels both cognitivists and constructivists to shed new light on the

¹ S. Carretero, R. Vuorikari, Y. Punie, *DigComp 2.1: The digital competence framework for citizens with eight proficiency levels and examples of use*, EUR 28558 EN, 2017, doi: 10.2760/38842.

² R. Feldman, *Child Development*, Upper Saddle River, NJ 2010.

³ G. Grace, *Education and the City: Theory, History and Contemporary Practice*, New York 2013.

concept of readiness for e-learning. As Doolan et al.⁴ noted, the social context of learning within the digital world, including social media, has become a central tenet of learning. Another vital aspect of the new realities of learning appears to be students' ability to be self-directed, autonomous learners.

Also, the digital competence of teachers remains a key factor in international educational policies to date.⁵ Following the definition of digital readiness proposed by Nasution et al., it is an "inclination and willingness to switch to and adopt digital technology and the readiness to create new innovative opportunities by using this technology in order to bring an individual, organization, industry, and country to achieve their goals faster and with greater results."⁶ To achieve it teachers need to be willing to constantly upgrade their technical competencies and communicate with other main pillars of the process: stakeholders and learners, acknowledging challenges and recognising possible opportunities.

Another essential factor that may contribute to digital readiness of schools is their learners' readiness for autonomy. It has been defined as the capacity for self-directed learning,⁷ which includes such notions as motivation, agency, collaboration, reflection, the ability to set realistic targets taking into consideration one's strengths and weaknesses, and the skills to choose appropriate learning objects and implement learning strategies. While autonomy as a phenomenon has been researched in the field of education for more than half a century, readiness for autonomy has been given much less attention.⁸ It is, however, a variable which might heavily influence the practice of e-learning in an educational institution.⁹

⁴ D.C. Doolan, T.J. Mehigan, S.J. Tabirca, I.J. Pitt, *Cross platform m-learning for the classroom of tomorrow*, [in:] *Wireless Technologies: Concepts, Methodologies, Tools and Applications*, Hershey, PA 2013, pp. 2042-2059.

⁵ OECD, *Education at a Glance 2021: OECD Indicators*, Paris 2021, doi: 10.1787/b35a14e5-en.

⁶ A.H. Nasution, Y. Murakami, T. Ishida, *Designing a collaborative process to create bilingual dictionaries of Indonesian ethnic languages*, [in:] *Proceedings of the Eleventh International Conference on Language Resources and Evaluation (LREC 2018)*, European Language Resources Association (ELRA), Miyazaki, Japan 2018, p. 97.

⁷ A. Cirocki, *Developing Learner Autonomy through Tasks: Theory, Research, Practice*, Halifax 2016, pp. 29-30.

⁸ S.M. Thang, A. Alias, *Investigating readiness for autonomy: A comparison of Malaysian ESL undergraduates of three public universities*, "Reflections on English Language Teaching" 2007, vol. 6, no. 1, pp. 1-18; Ö. Yıldırım, *Turkish EFL learners' readiness for learner autonomy*, "Journal of Language and Linguistic Studies" 2008, vol. 4, no. 1, pp. 65-80; G. Sönmez, *How ready are your students for autonomous language learning?* "Turkish Online Journal of English Language Teaching (TOJELT)" 2016, vol. 1, no. 3, pp. 126-134; A. Cirocki, S. Anam, P. Retnaningdyah, *Readiness for autonomy in English language learning: The case of Indonesian high school students*, "Iranian Journal of Language Teaching Research" 2019, vol. 7, no. 2, pp. 1-18.

⁹ M. Goulão, M.C. Menedez, *Learner autonomy and self-regulation in eLearning*, "Procedia: Social and Behavioral Sciences" 2015, vol. 174, pp. 1900-1907, doi: 10.1016/j.sbspro.2015.01.853

Both the “inclination” mentioned by Nasution et al.¹⁰ in the definition of digital readiness and the willingness to undertake autonomous activity, listed by Cirocki,¹¹ assume the learners and the teachers are highly motivated to undertake the effort of upgrading their skills, finding out about useful strategies and resources, and controlling conflicting drives and motives present at any time of human activity.¹²

The pandemic situation has also brought about profound changes in the educational system that have required, on the one hand, the adaptation of the teaching of each discipline or module and, on the other hand, additional professional skills for teachers developed and put into practice in a short time, which resulted in an abundance of ideas and experiences. Therefore, an Erasmus+ funded strategic partnership project IDEA (Innovative Digital Education Approach) has been put forward by six partner institutions aiming to gather the experiences, draw conclusions, and provide suggestions for solutions. The overreaching target of the project partners is to improve the quality of education in VET schools across Europe regarding the development of new innovative methodologies for creating digital educational environments for VET students.

Prior to embarking on the quest, each partner analysed their country’s educational context and provided a brief analysis based on observations, discussions with colleagues, and desk research. Subsequently, a current situation regarding digital readiness at selected secondary vocational schools was analysed. The paper summarises the research carried out among secondary school teachers, aimed at probing their attitudes and gathering their experiences. It aims at testing the teachers’ readiness for digitising teaching distinguishing areas which need to be supported with additional tools and methodology in the future.

Methodology

To carry out the study a thematic analysis of the VET teaching context provided by representatives of educational institutions from five countries (Poland, Spain Portugal, Romania, North Macedonia) was carried out to filter the issues that could be crucial in evaluating and comparing

¹⁰ A.H. Nasution et al., op. cit., p. 97.

¹¹ A. Cirocki, *Developing learner autonomy through tasks...*, op. cit., pp. 29–30.

¹² Z. Dörnyei, *Teaching and Researching Motivation*, Cambridge 2001; Z. Dörnyei, *The Psychology of the Language Learner: Individual Differences in Second Language Acquisition*, Mahwah, NJ 2005.

the issues teachers face in various contexts and cultures. The analysis resulted in the following problem areas:

1. Technical problems:
 - a. with equipment,
 - b. with internet connection,
 - c. with ICT tools / apps.
4. Students' lack of motivation.
5. Students' lack of readiness for autonomy.
6. Students' anxiety.
7. Designing activities for online classes.
8. Preparing scenarios for online classes.
9. Developing learning goals in online classes.
10. Evaluating student learning.
11. Communication with students.
12. Balancing diverse learners' needs.
13. Disciplining students.
14. Parental support.
15. Time constrains / time management.
16. Adaptation of your teaching style to blended / online teaching.
17. Access to guidelines / methods / techniques of teaching online.

A focus group discussion carried out with 7 secondary school teachers cooperating with the UAS in Tarnow in a national project implementing blended learning in secondary schools (Malopolska Educational Cloud) brought some more highlights to the attention of the researchers:

- teaching experience;
- experience in implementing blended / distance teaching before the pandemics;
- experience in using tools adapted to blended / distance teaching during pandemics.

Subsequently, points concerning the demographics of the respondents were added, since the information about the respondents' background might also be of importance, considering the respondents may be coming from culturally different areas. The resulting tool used for the study took the form of a questionnaire that can be viewed in Appendix 1. It was transferred to GoogleForms, so that partners could use the English version as a model if they decided to use an electronic version in their native language as well. The questionnaire was accompanied by an introduction, informing participants of the purpose of the survey and assuring them of their anonymity and fair treatment of data. Each partner translated the questionnaire to their

national language and reached the target population i.e. teachers of secondary schools either via GoogleForms or via a paper version of the tool.

The resulting data were transferred to an MS Excel file and descriptive statistics were calculated. Subsequently, the data set was subjected to more in-depth analysis using IBM SPSS 26.0 package with the Exact Tests module. All dependencies, correlations and differences are statistically significant when $p \leq 0.05$.

The basic test that was used in statistical analyses is the Chi-square test for the independence of variables. It was mainly used for questions built on nominal scales. To determine the strength of the relationship, the following coefficients were used: Phi and V Kramer. The Phi measure also indicates the direction of the relationship (positive or negative). It should be remembered that the Chi-square test is accurate when none of the theoretical numbers is smaller than one and when no more than 20% of the theoretical numbers are smaller than 5. Therefore, for each analysis where the Chi-square test was performed, additional tests were carried out, in particular with small samples. These are tests performed with the following methods: exact or Monte Carlo. The estimated p test probability indicates whether the analysed relationship is statistically significant.

Participants

The study was carried out in the IDEA project partner countries (North Macedonia, Poland, Portugal, Romania and Spain) among secondary school teachers working at institutions that participated in the project and their partner institutions.

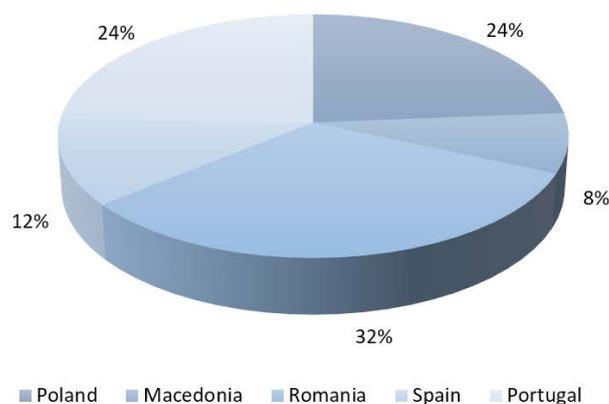


Fig. 1. Respondents' countries of origin

The teachers volunteered to fill in the questionnaire, either electronically or in a paper form (see Figure 1).

The study yielded 142 respondents: 106 women, 35 men, and one response where gender was not specified (see Figure 2).

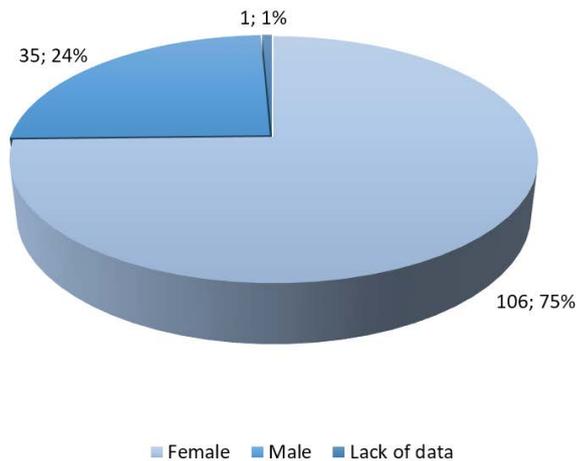


Figure 2. Respondents' gender

When it comes to the age of respondents (see Figure 3) the most numerous age group, constituting almost a half of all the participants of the study, are teachers declaring the age of 41–50. What is also interesting to notice is that teachers over the age of 50 constituted almost 20% of the cohort and teachers below the age of 30 made up only 4.2% of the sample.

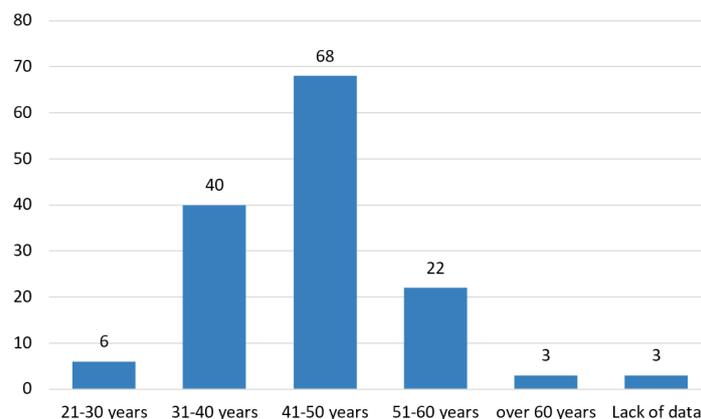


Figure 3. Respondents' age

The respondents' teaching experience was diverse (see Figure 4), but more than three quarters of the respondents have been teaching for more than ten years, which suggests that they have had substantial understanding of the field prior to the study.

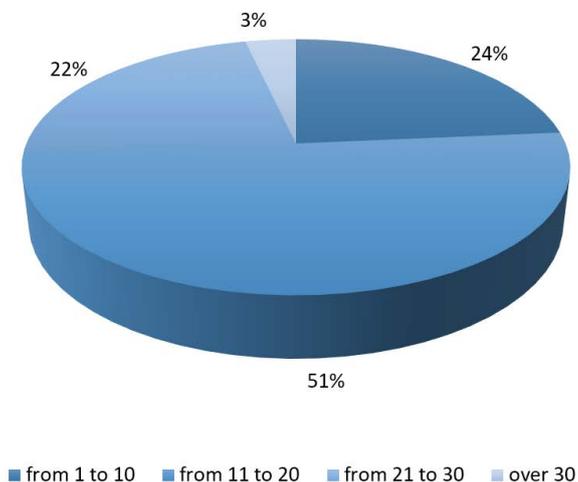


Figure 4. Respondents' teaching experience

The mean length of the teaching experience of the surveyed teachers was 16.52 +/- 8.036 (standard deviation). The smaller the deviation, the more the individual results are clustered around the mean. The minimum value was 1 and the maximum value was 43. The subjects that respondents teach are varied. They have been categorised into 5 areas: arts and humanities, ICT, natural and mathematical sciences, vocational subjects, social sciences and economics (see Figure 5).

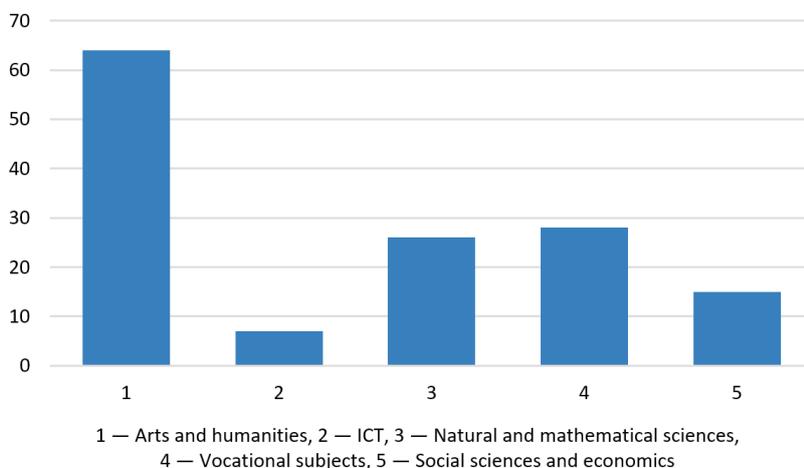


Figure 5. Subject categories respondents' teach

The largest group of respondents was made up of teachers of languages (both native and foreign). They constituted almost a half of the subjects. The smallest number of respondents taught subjects connected with Information and Communication Technology (ICT).

Results and findings

When analysing the type of teaching implemented during the COVID-19 period 22.1% of the respondents chose a blended design, 45% selected distance teaching, 52.9% of teachers admitted to implementing both of these, 2.1% of the subjects chose “none”, and 5% chose “other”. Two respondents specified “other” as “videoconferences” and “face-to-face teaching”. Other respondents did not provide an answer.

When it comes to the tools used by the teachers before the COVID-19 pandemic, a vast majority of them pointed at various ICT applications. Videoconferencing tools and learning management systems were scarcely used by the teachers (see Figure 7). What is more, more than 30 percent of the respondents did not choose any of the options, which might suggest they did not use any ICT tools. The situation changed during the pandemics, as only 2 of the respondents did not provide an answer (see Figure 8). The percentage of the responses for the first two queries (videoconferencing tools and learning management systems) also grew substantially, with the videoconferencing tools leading the way during the COVID-19 period.

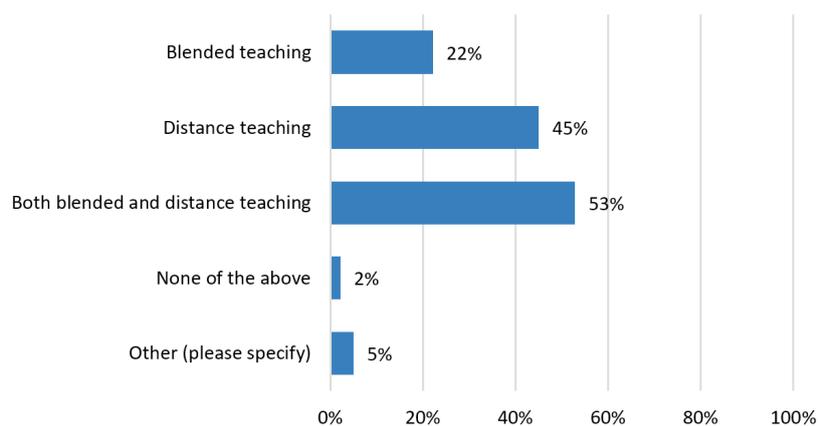


Figure 6. Type of teaching employed during the COVID-19 period

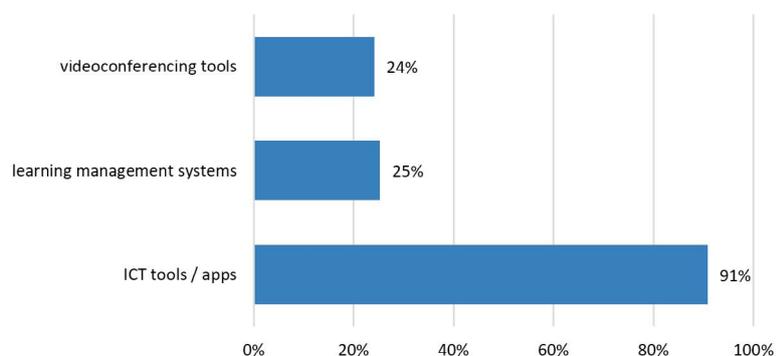


Figure 7. Types of tools used by the respondents before the COVID-19 period

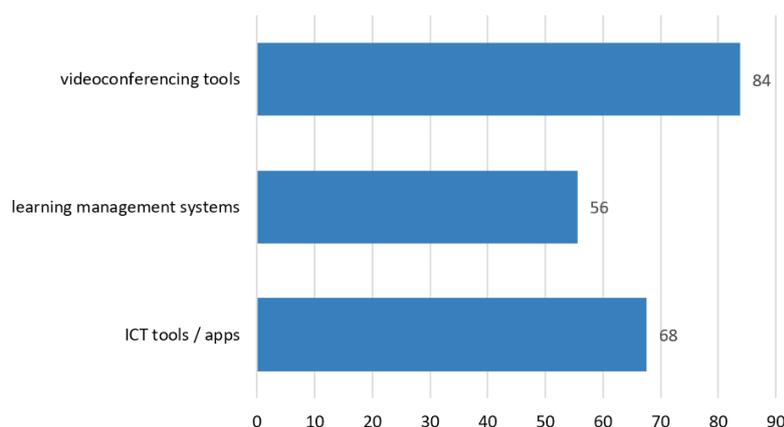


Figure 8. Types of tools used by the respondents during the COVID-19 period

When it comes to the type of tools listed by the respondents, there was a great variety of them, both before and during the pandemic period (see Figure 9, Figure 10). In the questionnaire it was possible to name any number of tools. The numbers featuring next to the names of the tools demonstrate how often the tool was mentioned by the respondents. It may be worth noting that the selection of tools used during the pandemics was scarcer than before it. However, some of the tools were used by the a vast majority of the respondents. Video conferencing tools, such as MStTeams, GoogleMeet and Zoom appeared to gain popularity during the pandemic and they scored the highest in the frequency table. Both before and during the pandemic,

applications making it easy to create tests, publish information, search for materials, and share materials were popular. However, some of the tools mentioned by teachers as used in the process of teaching before COVID-19 were not mentioned in answer to the question probing the tools used during the pandemics. Also, some applications, such as Gmail or YouTube, were not mentioned so often during the pandemics as before it.

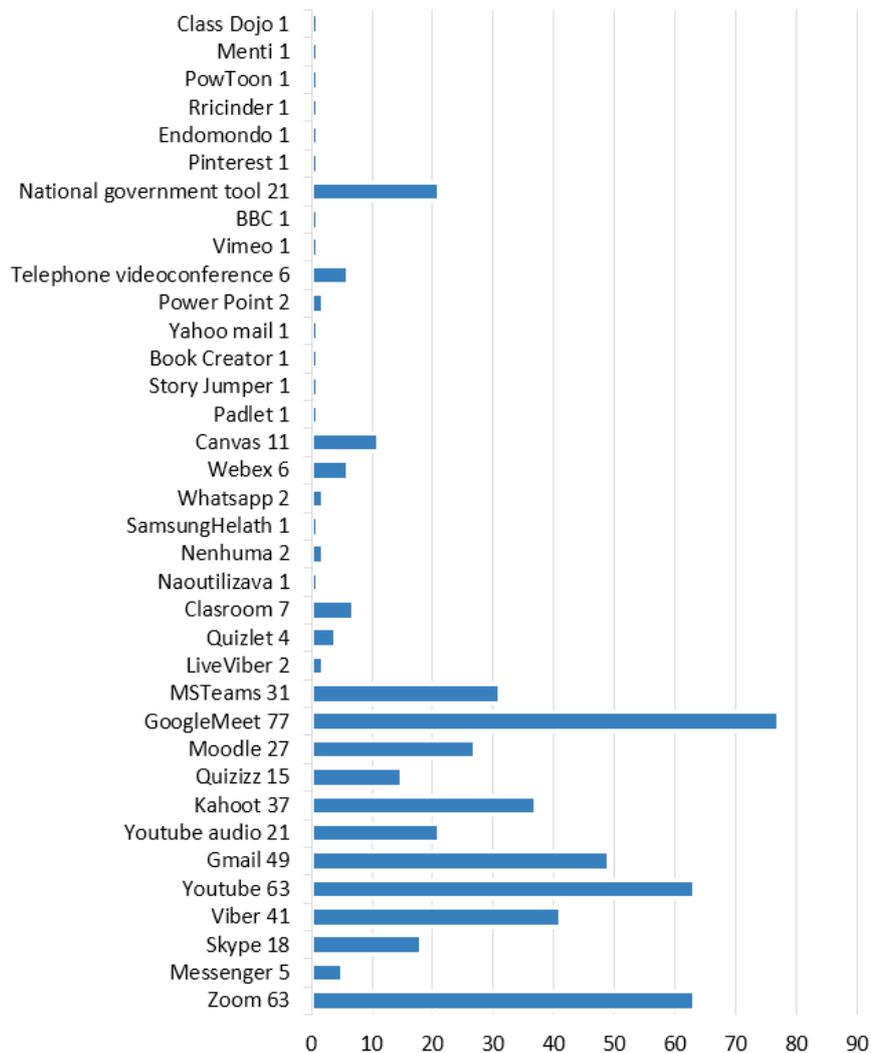


Figure 9. Videoconferencing tools, LMSs, apps used before COVID-19

The most striking finding that calls for a thorough consideration is the selection of issues that teachers encountered while implementing blended or distance teaching (see Figure 11). Respondents were able to mark multiple issues, therefore the percentages do not add up to one hundred. Technical

problems with the Internet connection were reported by 71% of the respondents. The second most frequently indicated issue reported by 69.7% of the respondents was lack of the students' motivation to learn. The third most burning problem, indicated by 52.8% of the respondents, was lack of the learners readiness to learn in an autonomous way. A problem that was almost as frequent was the issue of evaluating the learners' progress with 49.3% of the respondents marking this point in the questionnaire.

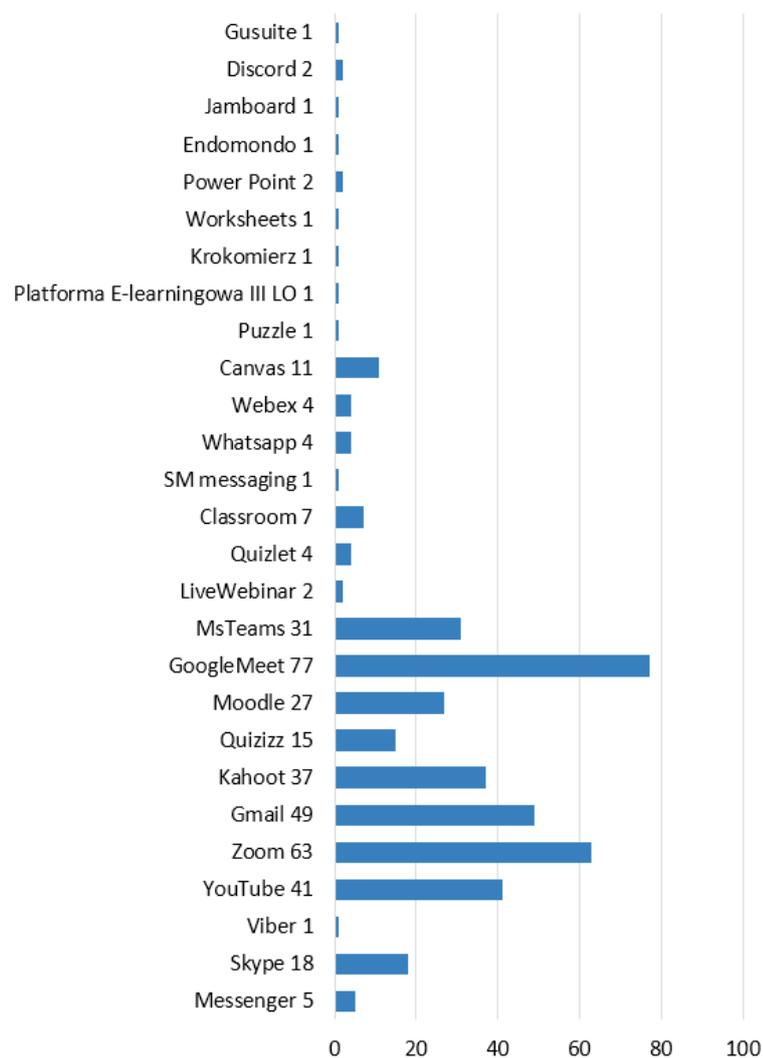


Figure 10. Videoconferencing tools, LMSs, apps used during COVID-19

The next most frequent problem indicated by 42.3% of the sample concerned technical problems with the equipment. The sixth of the most frequently marked problems regarded the students anxiety, marked by 40.8%

of the cohort. Unfortunately, the respondents did not specify what the feeling was specifically caused by. There were several issues that received an almost equal value of gravity of around 30%. Three of them concerned the process of preparing and delivering blended or online classes: developing learning goals in online classes, preparing scenarios for online classes, adaptation of one’s teaching style to blended / online teaching. Two of them were about the interaction with learners and regarded communication with students and balancing diverse learners’ needs. The remaining six problems were each marked by around 20% of the respondents: technical problems with ICT tools / apps, developing learning goals in online classes, disciplining students, parental support, time constrains / time management, access to guidelines / methods / techniques of teaching online.

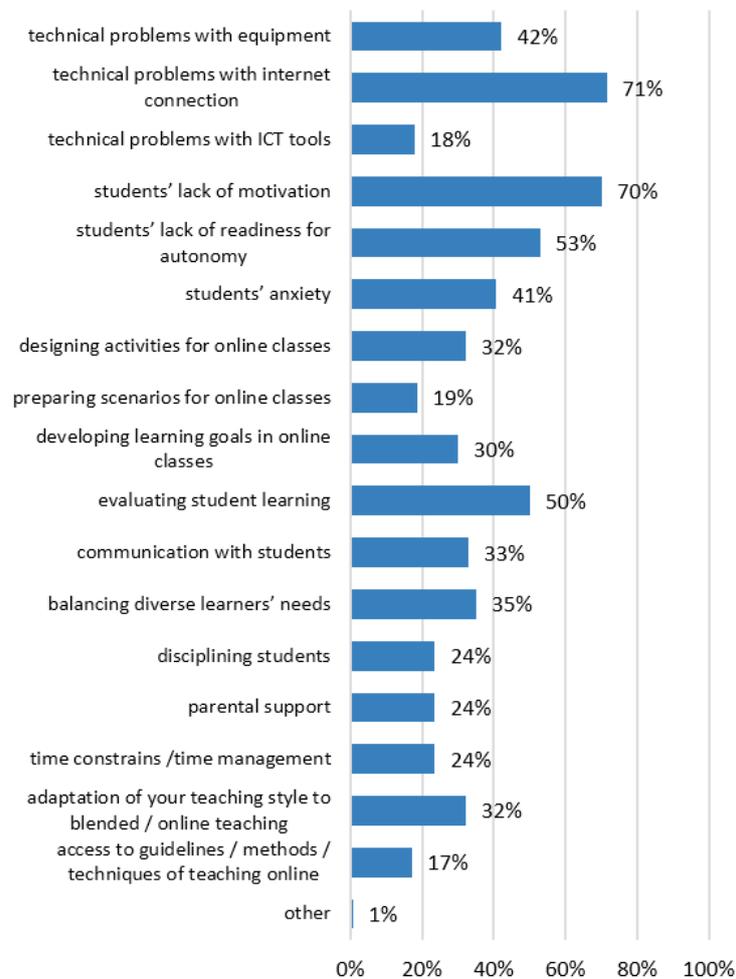


Figure 11. Issues teachers encountered while implementing blended or distance teaching

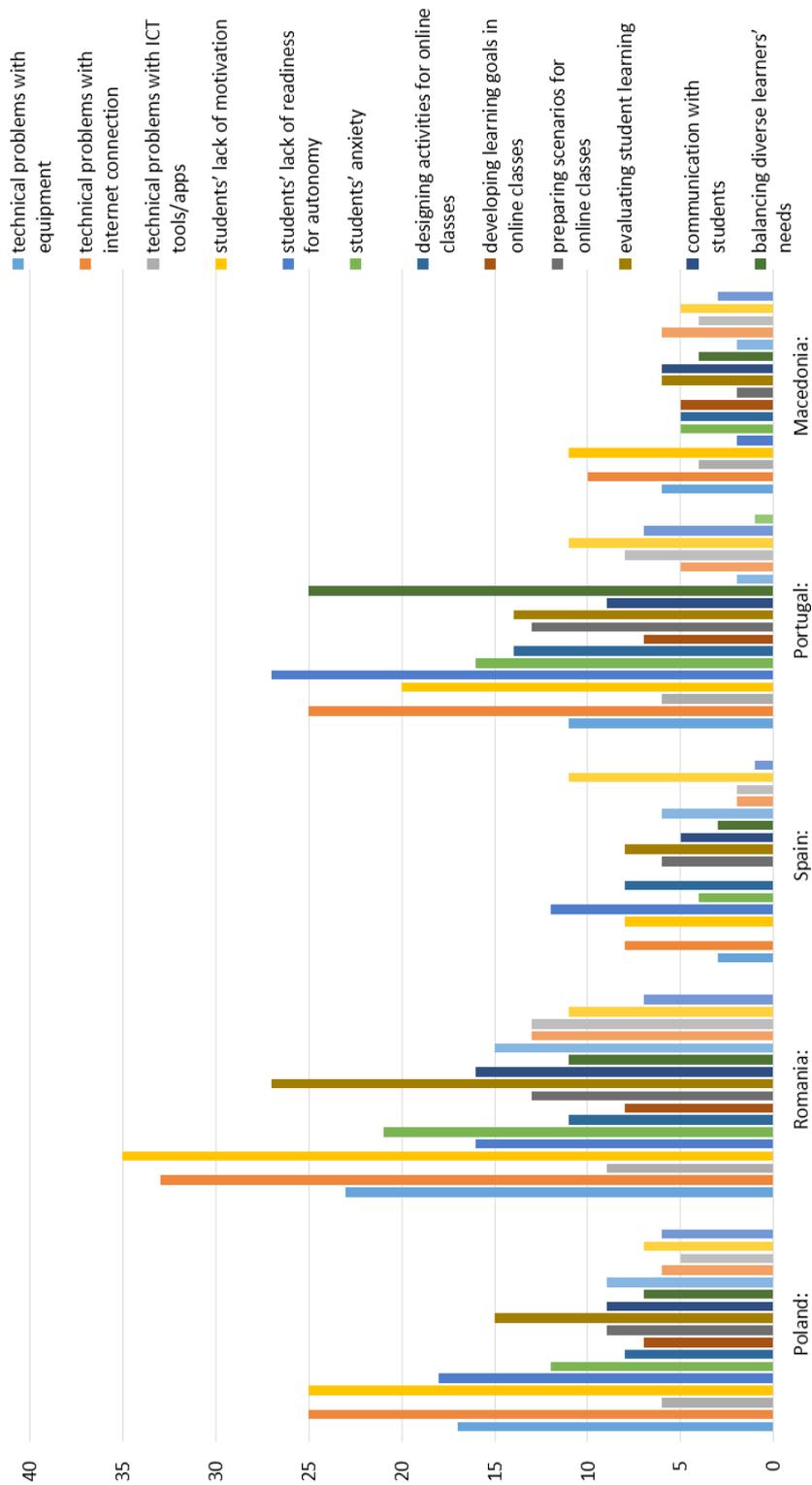


Figure 12. Issues teachers encountered while implementing blended or distance teaching by country (for percentage values see Table 1)

When analysed by country, it appeared that the intensity of the issues was country-dependent dependent (see Table 1, Figure 12)

Table 1. Issues teachers encountered while implementing blended or distance teaching by country

	Poland	Romania	Spain	Portugal	Macedonia
Technical problems with equipment	51.5%	51.1%	18.8%	32.4%	54.5%
Technical problems with internet connection	75.8%	73.3%	50.0%	73.5%	90.9%
Technical problems with ICT tools / apps	18.2%	20.0%	0.0%	17.6%	36.4%
Students' lack of motivation	75.8%	77.8%	50.0%	58.8%	100.0%
Students' lack of readiness for autonomy	54.5%	35.6%	75.0%	79.4%	18.2%
Students' anxiety	36.4%	46.7%	25.0%	47.1%	45.5%
Designing activities for online classes	24.2%	24.4%	50.0%	41.2%	45.5%
Developing learning goals in online classes	21.2%	17.8%	0.0%	20.6%	45.5%
Preparing scenarios for online classes	27.3%	28.9%	37.5%	38.2%	18.2%
Evaluating student learning	45.5%	60.0%	50.0%	41.2%	54.5%
Communication with students	27.3%	35.6%	31.3%	26.5%	54.5%
Balancing diverse learners' needs	21.2%	24.4%	18.8%	73.5%	36.4%
Disciplining students	27.3%	33.3%	37.5%	5.9%	18.2%
Parental support	18.2%	28.9%	12.5%	14.7%	54.5%
Time constrains / time management	15.2%	28.9%	12.5%	23.5%	36.4%
Adaptation of your teaching style to blended / online teaching	21.2%	24.4%	68.8%	32.4%	45.5%
Access to guidelines / methods / techniques of teaching online	18.2%	15.6%	6.3%	20.6%	27.3%
Other(s)	0.0%	0.0%	0.0%	2.9%	0.0%

The respondents from North Macedonia, statistically, more often than others, indicated the lack of motivation in students as a problem in remote or mixed learning. This type of problem is perceived less often by respondents living in Spain and Portugal. Lack of readiness for independent work among students was clearly most often noted by the respondents from Spain and Portugal, while the respondents from North Macedonia chose it least frequently. The respondents from Portugal much more often than the rest of the respondents complained about being able to meet the diverse needs of the students in the group, and the least frequently about disciplining them. The problem of lack of parental support is noticed by respondents from Macedonia to a greater extent than respondents from other countries, while the difficulties in adapting the teaching style to hybrid / distance learning are noticed by respondents from Spain. The share of the above answers is statistically significantly dependent on the inhabited country. However, the values of Kramer's V coefficients indicate quite distinct strengths of the relationship.

Respondents whose educational institutions are located in rural areas see problems with parental support more often than respondents whose educational institutions are located in small towns and cities. The relationship between the variables is statistically significant and is characterized by a slight strength of the relationship. Taking into account the other answers, they are not statistically significantly dependent on the type of area where the institutions are located.

Women, more often than men, perceive problems with adapting their teaching style to the requirements of hybrid and distance teaching. The dependency coefficient is statistically significant and has the strength of the relationship at the level of $\Phi = -0.274$. Other answers are not statistically significantly dependent on gender.

Discussion

The results of the study have shown that the greatest problem identified in VET schools while providing online education did not concern the teachers or learners themselves, but the infrastructure which assured the Internet connection and the hardware used by teachers. It seems compatible with a number of studies carried out during and after the pandemic.¹³ The researchers also pointed at the broadband quality

¹³ E.g. F. Saleem, W. AlNasrallah, M.I. Malik, S.U. Rehman, *Factors affecting the quality of online learning during COVID-19: Evidence from a developing economy*, "Frontiers in Education" 2022;

of schools and individual teachers, as well as at access to appropriate equipment, as absolute prerequisites of providing high-quality online education. The solutions which could be suggested to improve the state of affairs may have to be different for each educational context. However, in general, there is a widespread agreement the stakeholders need to invest in the infrastructure and hardware to improve the situation.

The second most frequent issue pointed at by VET teachers was the problem of students' lack of motivation. It is also visible in other studies probing the readiness of learning communities for high-quality online education.¹⁴ The problem seems to have been noted by researchers on various levels of education.¹⁵ A set of possible recommendations may be found in Dörnyei,¹⁶ since some of the motivational strategies suggested by the author for a narrow community of language learners have already been proven to be effective in other fields of education.¹⁷ Such strategies as focusing on the utilitarian value of the activities, rewarding attainment related to effort, emphasising collaboration and cooperation within the group of learners, or monitoring learners' time management were proved to be effective in on-line education for improving the students' motivation to participate during the classes. On the other hand, other authors suggest exploiting pedagogies

M. Iravani, M.B. Nasab, H. Bahmaei, S. Ghanbari, Z. Mohaghegh, S.F. Siahkal, *The level of satisfaction and quality of E-learning in medical universities of Iran during the epidemic of COVID-19*, "Journal of Education and Health Promotion" 2022, vol. 11, pp. 1-9, doi: 10.4103/jehp.jehp_1555_20; J. Cullinan, D. Flannery, J. Harold, S. Lyons, D. Palcic, *The disconnected: COVID-19 and disparities in access to quality broadband for higher education students*, "International Journal of Educational Technology in Higher Education" 2021, vol. 18, no. 26, doi: 10.1186/s41239-021-00262-1; A.P. Cattaneo, M. Rauseo, *How digitalised are vocational teachers? Assessing digital competence in vocational education and looking at its underlying factors*, "Computers & Education" 2022, no. 176, doi: 10.1016/j.compedu.2021.104358.

¹⁴ E.g. A.A. Chowkase, K. Datar, A. Deshpande, S. Khasnis, A. Keskar, S. Godbole, *Online learning, classroom quality, and student motivation: Perspectives from students, teachers, parents, and program staff*, "Gifted Education International" 2021, vol. 38, no. 1, pp. 74-94, doi: 10.1177/02614294211060401; M.S.A. El-Seoud, I.A.T.F. Taj-Eddin, N. Seddiek, M.M. El-Khouly, A. Nosseir, *E-Learning and students' motivation: A research study on the effect of e-learning on higher education*, "International Association of Online Engineering" 2014, vol. 9, no. 4, pp. 20-26, doi: 10.3991/ijet.v9i4.3465; M. Iravani et al., op. cit.

¹⁵ W. Revelle, J. Wilt, D.M. Condon, *Individual differences and differential psychology: A brief history and prospect*, [in:] T. Chamorro-Premuzic, S. von Stumm, and A. Furnham (eds.), *The Wiley-Blackwell Handbook of Individual Differences*, Oxford 2011, pp. 3-38.

¹⁶ Z. Dörnyei, *Motivational Strategies in the Language Classroom*, Cambridge 2001.

¹⁷ E.g. A. Erarslan, M. Şeker, *Investigating e-learning motivational strategies of higher education learners against online distractors*, "Online Learning" 2021, vol. 25, no. 2, pp. 262-279, doi: 10.24059/olj.v25i2.2252; S. Vanslambrouck, Ch. Zhu, B. Pynoo, K. Lombaerts, J. Tondeur, R. Scherer, *A latent profile analysis of adult students' online self-regulation in blended learning environments*, "Computers in Human Behavior" 2019, vol. 99, pp. 126-136, doi: 10.1016/j.chb.2019.05.021.

which have proved to be effective in increasing learners' engagement in tasks such as gamification and project work.¹⁸

The third most frequently noted problem, indicated by 52.8% of the VET teachers taking part in the survey, was an insufficient preparation of the learners to learn in an autonomous way. It has also been noted in research to date.¹⁹ The recommendations put forward by the authors include treating the students' readiness for autonomy as an area which constantly needs to be supported, as the notion is a changeable state rather than a stable trait that learners are equipped with. Incremental changes in the daily routine of the classroom procedures passing on more and more responsibilities onto the learners ought to go hand in hand with providing them with skills and knowledge which will enable informed choice and an effective execution of the responsibilities.

While it is difficult to discuss some of the findings because of insufficient background information (e.g. regarding the causes of anxiety experienced by some students), other issues such as developing learning goals in online classes, preparing scenarios for online classes, adaptation of one's teaching style to blended / online teaching, improving classroom dynamics or interaction and communication with learners, and balancing diverse learners' needs require further professional development on the part of the teachers, who however, complained they had insufficient access to guidelines, methods and techniques of teaching online. The need for constant upgrading of teaching skills has also been voiced in the literature on online education.²⁰ Given the motivation of the staff to be involved in improving

¹⁸ E.g. K. Papanikolaou, M. Boubouka, *Promoting collaboration in a project-based e-learning context*, "Journal of Research on Technology in Education" 2010, vol. 43, no. 2, pp. 135-155; Y. Yuliani, N.S. Lengkanawati, *Project-based learning in promoting learner autonomy in an EFL classroom*, "Indonesian Journal of Applied Linguistics" 2017, vol. 7, no. 2, pp. 285-293; E. Nurhayati, D.R. Rizaldi, Z. Fatimah, *The effectiveness of project-based learning with the blended learning system to improve 21st century skills during the COVID-19 pandemic*, "Journal Scientia" 2020, vol. 9, no. 2, pp. 46-52; S. Park, S. Kim, *Is sustainable online learning possible with gamification? The effect of gamified online learning on student learning*, "Sustainability" 2021, vol. 13, article no. 4267, pp. 1-12, doi: 10.3390/su13084267.

¹⁹ E.g. I. Leon, M. Sagarna, F. Mora, J.P. Otaduy, *BIM application for sustainable teaching environment and solutions in the context of COVID-19*, "Sustainability" 2021, vol. 13, no. 9, article no. 4746, doi: 10.3390/su13094746; S. Spiridonova, O. Karpushova, *Psychological readiness of students for joint activity as autonomous actors*, [in:] *Parpha Proceedings: VI International Forum on Teacher Education*, 2020, pp. 2429-2440, doi: 10.3897/ap.2.e2429; F. Saba, *Theories of distance education: Why they matter*, "New Directions for Higher Education" 2016, vol. 173, pp. 21-30, doi: 10.1002/he.20176; M. Goulãoa, M.C. Menezes, *Learner autonomy...*, op. cit.

²⁰ A.P. Cattaneo, M. Rausedo, *How digitalised are vocational teachers?...*, op. cit.; C. Foo, B. Cheung, K.-M. Chu, *A comparative study regarding distance learning and the conventional face-to-face approach conducted problem-based learning tutorial during the COVID-19 pandemic*, "BMC Medical Education" 2021, vol. 21, no. 1, article no. 141; F. Saba, *Theories of distance education...*, op. cit.;

their teaching workshop, the availability of training materials and training opportunities has been recommended by all the authors.

Conclusion

As shown in the Discussion part, the process of implementing blended and distance teaching needs a thorough consideration of the context: the needs and assets of the teachers, the institutions involved, and the infrastructure where they reside. The overall readiness of schools is a resultant of many factors, the majority of which are strongly context-bound. It refers both to the technicalities of the process (e.g. quality of hardware, reliability of the Internet connection, access to software) and the skills involved in utilising them (e.g. knowledge of the software, access to online / digital resources, adaptation of pedagogies and strategies, adaptation of interpersonal and sociolinguistic skills and practices). It is a proper mix of the variables that results in highly satisfying, and effective learner experience – the aim of all educators.

Overall, the study revealed the current readiness of VET schools for online learning, as shown through the evaluation given by teachers taking part in the study, ought to be improved. Areas for improvement, as well as recommended starting points for possible actions leading to improvements, have been suggested. It is, however, the collaborative work of all the pillars of education: the stakeholders, the teachers, and the learners that need to make an effort to adjust to the fast pace of changes currently witnessed in education.

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