

Chapter One

Teaching and learning during COVID -19

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Abstract

Remote learning, which until now was mainly the domain of the business world, also found its way to universities and schools due to COVID-19. Supporting e-learning through interactive virtual campuses has therefore become a necessity and not just a future goal of education. Models measuring the level of acceptance, learning efficiency and academic effectiveness, but also taking into account the level of skills and social competencies, are just emerging. In this aspect, we conducted research on large student groups to evaluate the remote learning process for which configuration, metadata, and statistical research are necessary in order to evaluate a learning management system.

Keywords: Integration of information and communication technologies, Education management, Learning management, e-learning; social competences, Teaching effectiveness, Academic effectiveness

Introduction

In theory, the transition from one education system to another in the 21st century should be smooth. However, the practice, as research has shown, is different. And as European research shows: more than 85% of teachers had no previous experience with e-learning, and therefore it was difficult for them to implement in the world of e-learning platforms, video conferencing software and remote communication with students. As many as 36% of teachers also complained about students having problems with the equipment. These problems resulted not only from too few computers in the homes but also due to the fact that some of them do not support the software chosen by the teacher. Over 46% of teachers complained that distance learning is too time-consuming, which is due to, for example from the need to learn how to use the software, reply to dozens of messages from students or university administration, as well as prepare and check materials sent by students online. There were also problems related to network security (West, 2020; Santiago et al., 2020). Commonly used learning platforms also had problems with connection security. In addition, there were psychological challenges (related to the feeling of isolation) (Maddox, 2020). That is why it is worth thinking about how to improve the e-learning process. The aim of the study is to learn

and diagnose the sources of variability and the impact of distance learning during the first phase of COVID-19 on the learning outcomes of students.

E-learning efficiency and effectiveness

Teaching and learning are built to benefit communities of practice both domestic and global. The extraordinary time of the pandemic and remote learning provided an opportunity to reconsider what it means to create a community, without face-to-face engagement and experience. Technology provided us the platform of an equitable approach to focus and fostering an inclusive virtual teaching and learning experience to mitigate the likely worsening equity gaps in the education process. Features that were innovative, novel, and useful at such a period were, mediums for messaging, online project submission and response paraphernalia for providing comments, which were audio/video (A/V) facilitated. The virtual Blackboard had real-time video conferencing through virtual classrooms, file sharing, screen-sharing, online chat etc. Additional features were footage and distribution of lectures, inserting links to footages on webpages, switching easily to view various other recordings, self recording and downloading of videos for offline viewing were optional, even through mobile applications (Cabero-Almenara et al., 2018; Maddox, 2020). Appreciating that traditional bell-to-bell teaching is by no means practical in distance learning environments that may extend for now into the future; educational institutions need to maximize contact, communication, and instruction suited best for the students.

Determining developmental expectations that are obvious, dependable, and reasonable is the basis for designing a safe, encouraging educational situation where each student is capable of accomplishing and flourishing. Teaching to meet those prospects, offering suitable support, and acknowledging success are key to good student development. Through sincere, supportive interactions, and training in socially sensitive understanding, every student can get into an institution that is secure, warm, pleasant, and gratifying. Access to gadgets and the Internet only are not adequate to guarantee delivery of high-quality distance education that is obtainable and connects all students. Formulate several delivery modes for remote education, avert an over dependence on gadgets to simplify student learning, and ensure ample assistance for families to be allies in the process of student learning. The pandemic has formed an occasion for institutions to method the delivery of education in exceptional and varied ways. Virtual education has expanded in frequency for assessing the expanded use of technology, in all its structures, to efficiently convene students' requirements and prepare the staff in their curriculum delivery. The use of technology along with availability of Internet resources within a community and its access by students and staff to those resources, bridges the digital divide (VQoE, 2020). Emerging new trends in the educational process are classroom-free learning, flexibility, personalized learning, mentoring, practical application, project-based thinking, learning and working, ownership, evaluation instead of examination, and data interpretation will become a fundamental new aspect of the curricula (Mogoş et al., 2018; Maddox, 2020).

Change and support to stakeholders

Every teacher has a unique teaching style which has been learned over a period, to build rapport with the students, observing their body language in class, their interaction with classmates, but this

online teaching in a digital environment is different when seen on computer screens and new kinds of interruptions and disturbances. There were accessibility and other problems faced during this mode of education, which included availability of devices or gadgets, network signal strength, electricity availability, parents' affordability to children's educational needs, government-imposed curfew, and loss in earning ability and others. COVID-19 has necessitated shifts to online teaching and learning formats, indicating openness for positive learning outcomes, along with community acceptance and engagement. New means of information sharing and teaching have an enormous potential but are likewise troubled. Conference in person has physical, palpable, and an experimentation value. Not all of our learners have the wish to study online, and not all have the capabilities to do so (Maddox, 2020). Like regular face -to-face teaching where the teaching content has invited students to learn new information implicitly by giving physical representation to academic concepts. In practice, this could involve taking a break in the lesson to do some stretching, building up mind maps around the classroom (Khalifa & Morgan, 2018), the digital classroom should also devise certain newer ways to connect the students. The use of the technologies for enhanced learning in education depends on factors, like management decisions, the teaching and learning material support, institutional infrastructure facilitations, easiness to adapt to the curriculum, readiness of the teachers and students to technologies, are the vital requirements from the stakeholders in order to create the environments that will be motivating and simulating an educational ecology for the future. Pandemic time infuses to educate students to think about the big picture and all social options available; while empowering the teachers to take a responsible role as experienced educators in providing the students with appropriate tools and choices which can shape them even during the period of crises (Ginsberg, 2020; West, 2020; Santiago et al., 2020).

Research material, methods and techniques

Research method means a set of theoretically justified concepts and methods covering the entire investigation procedure. The research technique, in turn, defines a set of practical activities, determined by certain procedures, allowing to obtain verifiable facts, information or opinions. The research technique in this work is to conduct an interview, distribute questionnaires. The research tool was to be used for data collection (Durkheim, 2007). A questionnaire is a method for assembling information, containing exposed information by the respondent, in a standardized format with or deprived of the existence of an enumerator (Nowak, 2007). The questionnaire research used in this research was aimed at examining a certain group of students. They were based on a specific type of interview, which is a written interview, in which the questionnaire played an important role. In this study, it was completed by the respondent himself, and the role of the researcher was to develop a questionnaire, select people, and distribute the questionnaires. The questions specified in the questionnaire were both open and closed. In order to implement the assumptions, research was carried out using an interview questionnaire (Durkheim, 2007).

This study was intended to use both teaching and technology applications in education, from a measurable method to a questionnaire on an illustration of 520 university students. The studied phenomenon was the development of remote learning during the Covid-19 pandemic in Poland at the University of Life Sciences in Lublin and its impact on the academic community, the

University's activities for development and the scope of activities undertaken in this direction. This research was supported by an appropriately prepared questionnaire, thanks to which it was possible to study this phenomenon and its impact on many issues. The selection of respondents was random. The research was conducted in the period from March 20 to May 30, 2020 in the fields of: technical, natural and management.

The study verified the following, zero research hypotheses:

Distance learning methods are essential for learning outcomes against the null hypothesis that remote teaching does not affect the learning outcomes of students. The questions included in the survey mainly concerned the assessment of distance learning and its impact on the learning outcomes, including:

- developing knowledge and skills,
- development of social competences,
- factors favoring the development of distance learning,
- the impact of distance learning on the personal development of students,
- barriers limiting this development,
- actions taken by the University's administrative authorities to develop distance learning.

Descriptive statistics were used as the first and basic step in analyzing the collected data. It was used to assess the state of education, create the possibility of better use of the existing didactic and cultural base and identify opportunities and possibilities of using the natural potential of the University, thanks to marketing and other activities.

Results

Importance of distance learning for the academic community of the university

The age structure of the surveyed students was not very diverse. People aged 19-24 took the greatest part in the research, which constituted 92% of all respondents; 8% of the respondents are over 24 years old.

Shaping students' awareness was of the greatest importance for the development of the academic community (29%). Equally important for the development of the academic community, according to the respondents, was the need to increase the quality of life in society (26%) and the preservation of natural resources (25%), which will remain for future generations and others - 20% (Fig.1).

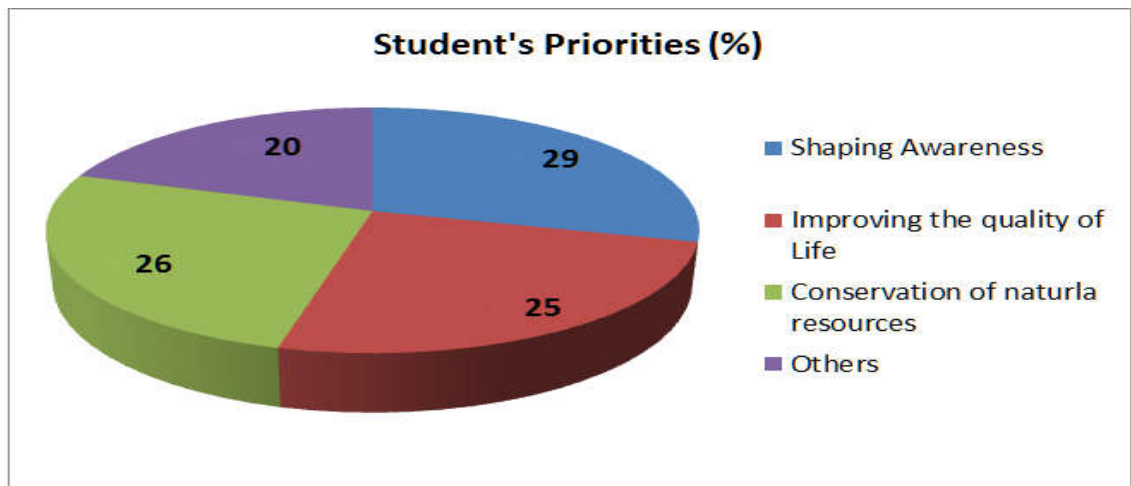


Figure 1: Students' priorities

Source: Authors' Construct

Shaping society for the sake of the environment accounted for 33%, and the new pattern of spending free time - 51% of all respondents' answers. Moreover, the respondents believe that the improvement of the education system will bring the desired increase in social capital (16%) (Fig. 2). The influence of the development of sustainable education systems on the academic environment is, according to the respondents, a positive phenomenon.

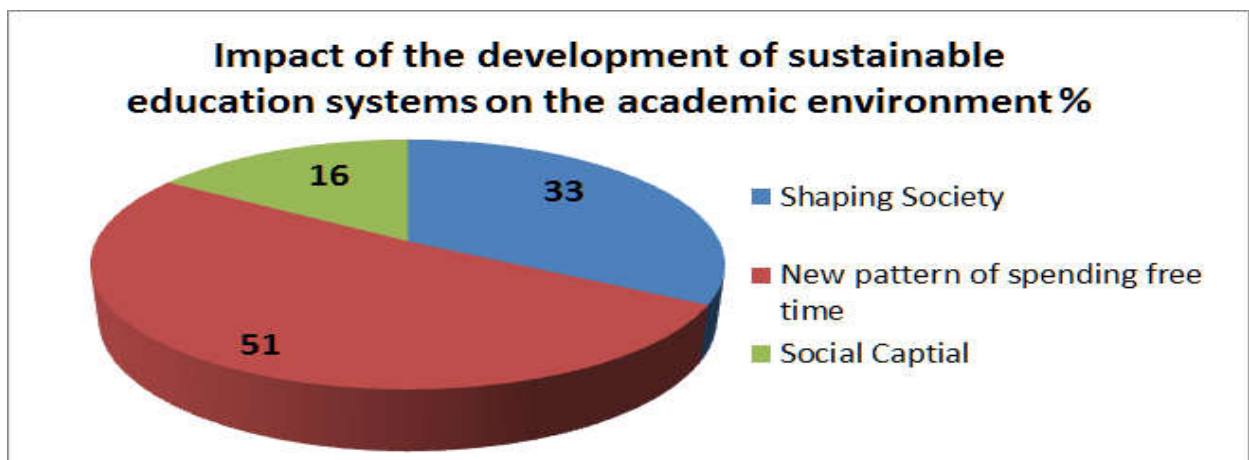


Figure 2: Impact of the development of sustainable education systems on the academic environment

Source: Own research

Sustainable actions for development of the academic community

A number of activities were undertaken at the University for the sustainable development of the academic community, but the most frequently observed were training of students and employees on the operation and use of e-learning platforms (36%). Classes were held regularly and at the appointed time on legal platforms recommended by the university authorities (30%). There were also observed savings in the management of office materials (15%) and pro-ecological waste

management (13%). Training aimed at shaping ecological attitudes and behaviors among students were also undertaken, according to 6% of the respondents (Fig. 3).

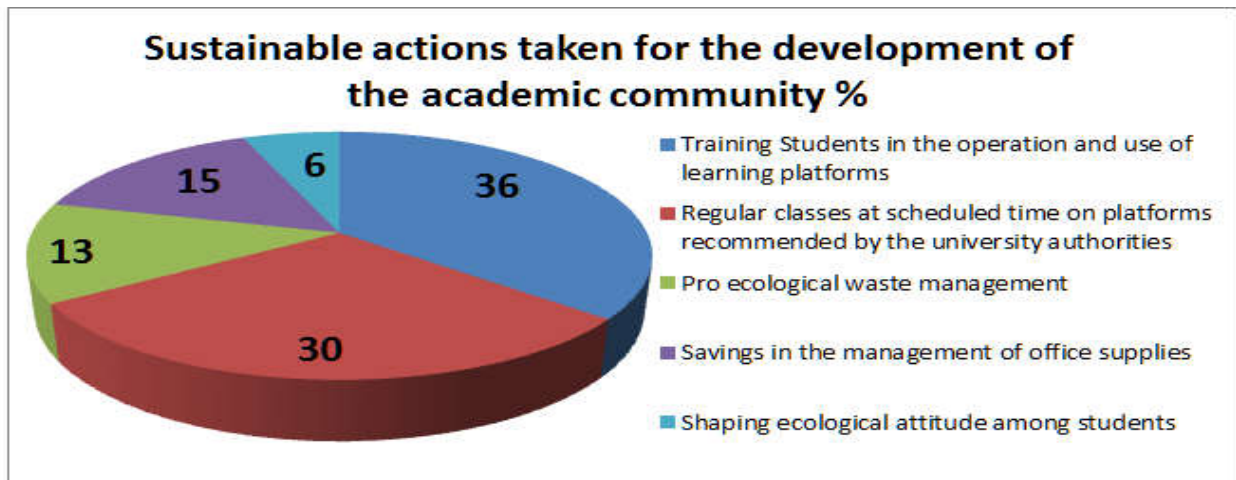


Figure. 3: Sustainable actions taken for the development of the academic community

Source: Authors’ Construct

Opportunities and barriers impacting sustainable development in teaching technologies

According to 47% of respondents, the chances of integrating teaching technology into sustainable development are high. For 33%, these chances are small, and 20% of respondents find it difficult to say anything about it (Figure 4).

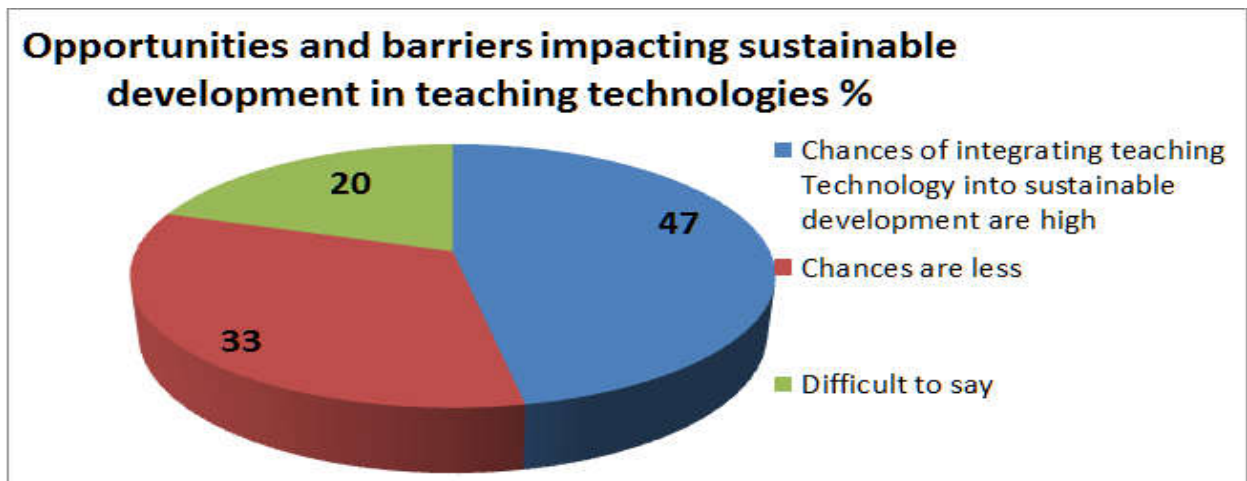


Figure 4: Opportunities and barriers impacting sustainable development in teaching technologies

Source: Authors’ Construct

One of the major barriers limiting the development of advanced teaching technologies is, according to 33% of respondents, the poor general condition of the IT infrastructure. In the opinion of 22% of respondents, little awareness of this subject is also an obstacle in overcoming barriers to the development of teaching technology. According to 28% of respondents, in overcoming these

barriers training in new, advanced technologies is necessary, as the small capital of an educated community is a serious barrier. According to 17% of respondents, the level of social communication should also be improved, because the poor condition of interpersonal relations significantly reduces the development of advanced technologies (Figure 5).

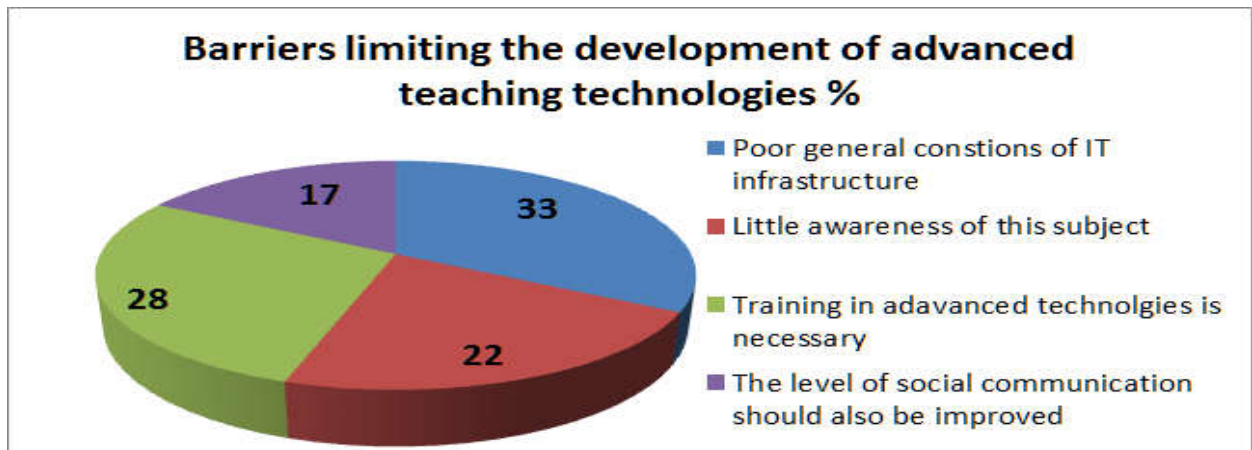


Figure 5: Barriers limiting the development of advanced teaching technologies

Source: Authors' Construct

Knowledge of security systems at the university

One of the questions in the questionnaire - the survey was to determine whether, according to the respondents, the university where they study on a daily basis has a security and crisis management system implemented. As many as 47% of the respondents stated that their university rather has such a system, and 31% of the respondents decided that their university did not have the above-mentioned system. Only 2% of respondents believed that it had no system in place, and 20% did not express an opinion on this subject (Figure 6).

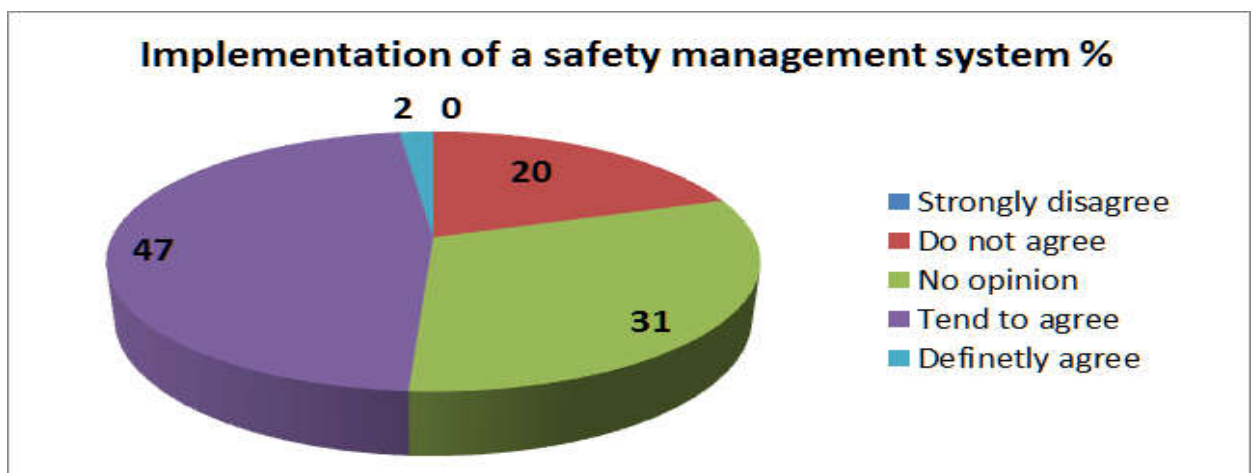


Figure 6: Implementation of a safety management system (%)

Source: Authors' Construct

This means that the vast majority of students have adequate knowledge of the University's security. Hazard Analysis and Critical Control Points allows you to ensure safety during threats caused by suddenly occurring threat factors. Not being aware of the existence of this system may lead to failure to comply with the relevant requirements.

Descriptive statistics of data

For the interpretation of empirical data, analytical methods were used, such as: descriptive and quantitative, based on models and statistical measures. Within these methods, the following measures of central tendencies such as median, and descriptive statistics such as kurtosis, skewness and coefficient of variation were used

Table 1: Descriptive statistics of independent variables

Parameters	x1	x2	x3	x4	x5	x6	x7
Median	3,0	5,0	7,0	8,0	5,0	6,0	8,0
Kurtosis	-0,1	2,1	-0,5	-1,8	-0,2	-0,8	0,1
Skewness	1,2	1,6	1,1	0,8	1,1	1,0	1,2
Range	58,0	62,0	54,0	52,0	58,0	55,0	56,0
Minimum	2,0	2,0	2,0	1,0	1,0	1,0	1,0
Maximum	60,0	64,0	56,0	53,0	59,0	56,0	57,0
coefficient of variation (V)	130,0	132,5	119,4	118,4	127,5	120,9	119,5

Source: Field survey.

Legend: 1 - developing knowledge and skills, 2 - development of social competences, 3- factors favouring the development of distance learning, 4 - the impact of distance learning on the personal development of students, 5 - barriers limiting the personal development of students, 6 - activities undertaken by the University's administrative authorities for the development of distance learning; 7 - Implementation of a safety management system

The average of the obtained results was at the level of 20.0. The numerical value of the median indicates that more than half of the results obtained are below the median value. Kurtosis is a degree of the absorption of results. On its basis, it is concluded that the obtained results are varied. Most of the features have values below 0, so there is a poor absorption of results around the mean. Skewness is a measure of asymmetry of the results. The skewness coefficient was close to "0" for the following variables: factors favoring the development of distance learning, the impact of

distance learning on the personal development of students, barriers limiting the personal development of students, activities undertaken by the University's administrative authorities for the development of distance learning; implementation of a safety management system. Among the other features, the skewness was > 1, which proves the right-hand asymmetry of the distribution. Positive skewness describes a distribution with asymmetry extending towards the positive values. Minimum and maximum are the elements that define the data range of each feature. From the formula: $V = S / x * 100$, in which S means standard deviation, x is arithmetic mean, and the coefficient of variation was determined. The impact of distance learning on the personal development of students turned out to be the least variable. The greatest variability was noted in the development of social competences (Table 1).

Table 2: Pearson's simple correlation coefficients

	<i>x1</i>	<i>x2</i>	<i>x3</i>	<i>x4</i>	<i>x5</i>	<i>x6</i>	<i>x7</i>
<i>x1</i>	1,00						
<i>x2</i>	0,99	1,00					
<i>x3</i>	1,00	0,98	1,00				
<i>x4</i>	0,98	0,96	0,99	1,00			
<i>x5</i>	1,00	0,99	1,00	0,99	1,00		
<i>x6</i>	1,00	0,98	1,00	0,99	1,00	1,00	
<i>x7</i>	0,99	0,99	1,00	0,99	1,00	1,00	1,00

Source: Field survey; *designations as in table 1.

Pearson's simple correlation coefficients were determined to determine the relationship between random variables. The strongest positive correlation was found between x5, x6 and x7, and the weakest correlation was found between x4 and x2. Almost all of the studied features turned out to be strongly positively correlated with each other (Table 2). The use of statistical methods allowed us to determine the characteristics of the student population, the coefficients of variation, and

allowed us to assess reliability, accuracy and correlations, using and integrating also data used by other researchers.

Discussion

In the age of COVID-19 University of HE institutions around the world have recognized the necessity to assume and fit in ICT to encounter the occasions and contests of invention in learning and teaching. As a result, this situation has led to the employment of virtual education settings, which functions to support supple and active education within a constructivist method. Virtual learning is fetching one of the greatest recurrently applied training means both in e-learning application as a solo stream; and in combination with face-to-face (F-F) learning and e-learning in higher education. Though, it is progressively accomplishing other levels of education (Luo et al. 2017; Molla & Cuthbert 2019) due to its flexible adaptability, interactive, multimedia and decentralized learning. The technology is reinforced by Learning Management Systems (LMS) (Pérez et al. 2008, 2016; Rienties et al. 2014; Moldovan, 2019), and the 'Moodle' system is one of the most used platforms in the world (Kerimbayev et al., 2017) and has a number advantages such as: no modification in each operation is a PHP compatible system. It acts on a set of components and permits modification by adding or deleting items at various stages. According to Inzunza et al. (2014), Horvat et al. (2014) and Priyana (2020) on this web-platform, tutors and learners have a high level of technological fulfilment and reception, and tutors incline to remark that its use improves instructive practice and represents immeasurable benefits (Kerimbayev et al. 2017; Jenaro et al., 2018; Sari & Ashadi, 2020). However, other studies have shown that there is great acceptance of use to the LMS Platform, but there is no general evidence that the use of a particular platform causes changes in pedagogical practice (Brown, 2008; Kinchin, 2012), where tutors pass on knowledge rather than develop it, or create new knowledge (Fariña et al. 2013; Santiago et al. 2020). It stimulates the debate in universities about the implementation of educational systems and educational practices, and these do not change so quickly.

In the wake of Industry 4.0, VET practitioners and academics are called upon to sustain and promote future curricula not only for students but also for employees. In this aspect, the research and the analysis of the literature make it possible to find a framework for classifying learning outcomes, skills and social competencies according to various sectors of science. In fact, by answering the research questions, our aim was to propose a comprehensive view on this aspect to (a) shed light on competencies for Industry 4.0 and (b) propose a possible framework for training programs (Symon & Whiting, 2019, Tommasi et al. 2020). As you can see, combining competencies requires particular attention to job sectors and role aspects. In this spirit, practitioners and researchers must understand the characteristics in order to tailor training programs to the different needs of students, staff, and organizations (Moldovan 2019, Molla & Cuthbert 2019, Umachandran & Della Corte, 2019).

Competencies support the high demand for soft skills and interpersonal competencies. Among all the reviewed points, there is a common understanding of the need to ensure sufficient support for interpersonal relations and internal aspects, such as the ability to adapt to the ongoing changes and deal with new technologies. Finally, the current literature review on the subject has some limitations. Although the method used is used in the literature, only a few remarks have been

identified and analyzed, and there is other relevant information that influences the characteristics tested. Larger studies could try to explore the development of more inclusive criteria as well as include an empirical examination of the evidence presented in the literature review.

Conclusion

Everyone is going through some type of home teaching and learning now because of the pandemic; hence it is important to note that it is the epitome of a critical educational style now. Engage openly with the students and open the space for them to share. Please offer them multiple avenues to contact you whenever they are struck with any learning difficulty, struggling so they can do so privately or in group discussion. These options will make the virtual teaching and learning scenario a space for safety, and accommodative. COVID-19 pandemic gives a chance for students to have a sense of purpose, and to use classroom conversations for trying to understand the options that could lead to the present situation and the course corrections that could be made to address them. As responsible citizens they can be encouraged to voice their views on the critical and continuing decisions, wherein they can commit themselves for guided actions, affecting the future. Widespread digitalisation in education can mitigate the learning loss caused by school-closures. However, in reality there are still concerns of economic impact affecting the students with stress, who live in under privileged home-learning environments devoid of relevant infrastructure such as gadgets and internet connection.

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