PRE-UNIVERSITY TEACHERS' DIGITAL COMPETENCE AND WELLBEING: AN ISRAELI AND ROMANIAN COMPARATIVE STUDY

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Abstract

In the context of the COVID-19 pandemic, education systems have adopted as a solution a high-speed transfer of face-to-face courses into online or distance ones. Moreover, teachers have been given very little or no guidance or prior training about online synchronous and asynchronous learning, online effective teaching strategies, proper digital gadgets and teaching platforms. There have consistently been reports that teachers have a higher risk of developing psychological disorders in comparison with people from other professional fields. Therefore, the research paper also investigates a concept frequently studied nowadays in connection with mental health, wellbeing- as it enhances the development of personal skills and the realization of personal potential. The study was conducted to assess and compare Israeli and Romanian pre-university teachers' digital competence and wellbeing after three semesters of virtual environment mediated teaching. Two self-reported scales with excellent psychometric value were used for gathering data, namely The Competence Framework for the Digital Competence of Educators (DigCompEdu) and Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS). The results showcase the differences and similarities of the two groups of teachers regarding six areas of digital competencies of educators proposed by the European Framework and wellbeing status. Finally, future research and teacher training issues are discussed.

Keywords: COVID-19, digital competence, remote learning, teacher training, wellbeing

1. Introduction

The review made by Dalgarno and Lee (2010) on virtual learning identified five key advantages that can bring benefits to the learning process. These five advantages are: representation of spatial knowledge, experiential learning, involvement, contextual learning and cooperative learning.

The practical implications of the study comprise the investigation of the premises for the development of a training program to maximize the wellbeing of teachers through sanogenic behaviors and digital skills in the context of digital media employment in education.

1.1. Digital competence

Digital competence constitutes all the components necessary for learning, teaching or conveying knowledge and information by means of digital tools and competence according to the current conditions of the digital age and the constraints following the period of corona throughout the world. The 21st-century skills involve, among others, technological skills in face of the existing situation in this digital-technological era. Digital literacy is the central component in the integration of digital competences into schools and it is defined as a person's ability to effectively fulfil assignments in a digital environment (Ilomäki et al., 2011).

The digital era that burst into the 21st century in fact defines the diverse methods of technology in digital learning as opposed to the two preceding centuries when it was also necessary to teach and convey knowledge and work methods. Digital learning together with its skills, particularly in the education system, has been continually updated over the years in the light of the existing digital competence in the civil sector whether directly or indirectly. The competences that the school leaders need to attain and demonstrate are also continuously updated (Sampson et al., 2018).

The factors incorporating digital competence are all the factors in general: school administration, the teaching community, the students, parents, school policy and infrastructure and the Ministry of Education in leading technological orientation.

During the corona period, there was a significant increase in the use of these technological skills in general that were introduced to the students and subsequently implemented. It is important to differentiate between technological competence and the teaching methods used by the teaching staff through these competences. Diverse competences were integrated into the education system and we will emphasize them here as part of competences that pre-existed in the civil sector: Learning by video: The lesson, or part of it according to topics, is recorded and the student can review the lesson independently as many times as necessary. Presentation or interactive presentation: the lesson material is conveyed together with student responses and dealing with the students using feedback tools. Questionnaires, practice, learning employing LMS (Learning Management System): each student receives the material, the exercises and the tests as part of the knowledge and ongoing work and contact with the teaching staff beyond the individual OFFLINE work of the student. The activity can also be done in groups. The system is one where the lead teacher in an ONLINE window can work freely at any given time as opposed to other existing systems such as TEAMS, MEET and ZOOM where the teacher and student are limited to a specific time frame. The Simulator is an important component in learning and the student experience with

this digital competence. It includes experience with all cases in general and edge cases in every professional field. Many simulators have been built in the practical world for practice and experience and constitute an enriching and challenging digital competence in understanding the material learned. Diverse sites integrating smartphone applications constitute a significant step up in the new era when Padlet digital competences of these tools enable interactive work with students and among themselves (For example: online Blended Google tools and many other such tools). Activity can be integrated offline also; it can be saved for further use or to start something new. Thinker Board has been in active use for a decade, marking the teaching with a smart board instead of the classic blackboard which had been used throughout and previous to the 20th century. Thinker Board includes two components: the first is an event bar monitoring each group's tasks like creating models, completing quizzes or performing simulations; the second is an outline presenting the order of succession of the activities completed by every group. These competences have actually opened the limitations of the classroom and one or more teachers can hold a lesson for one or more classes, a greater number of groups, in school or outside of school to include cooperation between countries if needed.

Other competences are by means of 3D learning tools. This field is developing rapidly in all areas. It has been well-known in the world of architecture for over a decade and these tools enable the student to experience and practice learning and understand in an accessible and exciting way. There is no need here for the teachers to be creative and build models themselves (not always with the best proficiency) and without the ability to change or adapt the models in order to demonstrate something else, in comparison to the use of digital tools where the change is almost immediate. The tools are extremely professional and are widely used in diverse industries. A modern digital competence is Gaming, an enjoyable activity for students these days, with the ability to integrate learning processes. Beyond these tools, it seems that the most dramatic technological competence for demonstration and learning, almost like a real tour and more, is the use of VR and AR. Virtual reality or augmented reality applications using special glasses have allowed learners to immerse and explore computer-generated worlds designed for educational purposes (Jung & tom Dieck, 2018). The classic experience these days are in-depth tours and escape rooms in gaming territory. The hologram competence is also integrated into the civilian world. It is available and can be integrated into the learning experience. Moreover, the work of excellent teaching staff can be documented for the future with the collaboration and integration of the other abilities.

These competences enable the students to gain an extraordinary learning experience as if they are visiting actual sites or seeing actual products. They are being exposed to knowledge through an exciting unique visual experience that will continually improve. The integration of holograms is already available, just put on the appropriate glasses and join the tour. Technology is not an end in itself; it can lead us toward the type of classroom of which we have all dreamed (Walker, 2011).

1.2. Wellbeing

Research findings have highlighted that the use of digital technologies in education causes worry and originates distress and workload, implying risks for teachers' wellbeing (Beetham et al., 2009). The concept of wellbeing is studied in connection with mental health and has attracted more and more attention from researchers in recent decades. Wellbeing is a key term related to how the World Health

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Organization (n.d.) defines good mental health (https://www.who.int/news-room/facts-in-pictures/detail/mental-health) and it is operationalized from the perspective of two approaches - hedonic and eudaimonic. While the hedonic approach refers to wellbeing as a personal disposition characterized by pleasure and satisfaction, being called subjective wellbeing (Bauer & McAdams, 2010), the eudaimonic approach is defined by the development of individual skills, behaving in the spirit of self-established values, and realizing one's own potential or having the feeling of a purposeful and meaningful life (Mcmahan & Estes, 2011).

Moreover, teachers' mental-hygiene has implications for students' school performance, emotional development and mental stability, as well as for the community spirit. It has been observed that low levels of wellbeing reduce teachers' belief about their ability to support students that have emotional or behavioural difficulties (Sisask et al., 2014). Weak relationships between teacher and student prove to be correlated with mental disorders and the dismissal of the child from the education institution in three years time. In contrast, teacher-student support relationships predict less subsequently depression for students and reduce the pauperism and little involvement during classes correlations (Kidger et al., 2012).

There have consistently been reports that the teaching profession comes with a higher risk of developing psychological disorders compared to other professional fields (Kidger et al., 2016). In fact, even in the pre-pandemic period, teachers faced common stress factors such as: pressure caused by the volume of work tasks, time management, reduced control over own activities, overload with administrative chores, difficult relationships at work, ambiguity role, fear of new devices and methods management, psychological load, performance anxiety and reduced self-confidence about mastery skills (Mercer & Gregersen, 2020).

2. Problem Statement

In the context of the COVID-19 pandemic, the reaction of the education systems from most countries was to cease face-to-face training and to instantly adopt an online or distance learning approach. Generally, teachers had to adapt their face-to-face courses into courses taught online through synchronous and asynchronous systems, frequently facing distressful challenges like accessing proper digital gadgets, lack of training regarding efficient online teaching methods and support platforms for online learning. While this is the case for many countries, including Romania, there are countries like Israel with a fairly long practice of using online learning.

- In order to make it easier for teachers to reach their full potential, life-long training courses should include, besides the development of digital skills, evidence-based issues regarding techniques that could enhance the wellbeing of the beneficiaries. Moreover, identifying the digital competence and wellbeing status of teachers is fundamental for further intervention programmes.

3. Research Questions

The present research study aims to answer the following questions: (1) What are the experience differences between Israeli and Romanian teachers in terms of educational technology use? (2) What are

the differences between the digital competences of Israeli and Romanian teachers? (3) What are the differences between the well-being level of Israeli and Romanian teachers? and (4) What is the relationship between digital competence and the well-being level?

4. Purpose of the Study

Considering the reviewed literature presented above, the objective of the present study is to investigate the digital competence and well-being level differences between teachers from Israel and Romania.

5. Research Methods

5.1. Participants and sampling method

The sample of the study was composed of 250 pre-university teachers from Israel and Romania. The sample comprised 63 male teachers and 187 female teachers. The sampling is a convenience one, participants being recruited from public Israeli and Romanian schools. Teachers were asked to voluntary answer an online survey in the last month of the current school year after previously informed consent.

5.2. Instruments

The scales we have chosen to measure the variables have very good psychometric properties. The first one, "The Warwick-Edinburgh Mental Wellbeing Scale" (WEMWBS) has been elaborated to measure mental wellbeing in the general population and the evaluation of programmes aimed at improving mental wellbeing. The WEMWBS scale has 14 items and 5 answer categories, summed to give a score, covering the hedonic and the eudaimonic approach. All items are formulated positively and encompass both the emotional and functional aspects of mental wellbeing, thus facilitating the understanding of this concept (Tennant et al., 2007). This scale has been applied worldwide in order to monitor and evaluate programmes and to analyse the mental wellbeing indicators, being validated for use in a wide variety of different geographical locations, cultural contexts, and various contexts, including schools (Stewart-Brown et al., 2011).

The second survey tool is the DigCompEdu questionnaire developed according to The European Commission's framework for the Digital Competence of Educators. It comprises 22 statements assessing teachers' digital technology practice, which are divided into 6 areas: professional engagement, digital resources, teaching and learning, assessment and empowering learners (Punie & Redecker, 2017).

6. Findings

6.1. Demographic characteristics of teachers

In order to examine the demographic particularities of the Israeli and Romanian sample groups, a descriptive statistical analysis was run in SPSS. As table 1 and table 2 show, the two samples are similar in terms of gender predominance, environment, age and job position status.

The Israeli sample consisted of 52 (34.2%) males and 100 (65.8%) females. The Romanian sample comprised 11 (11.2%) males and 87 (88.8%) females. The participants' age ranged from 40 to 49 for the Israeli group, and from 30 to 39 for the Romanian group. The majority, namely over 90% of participants, from both samples have permanent job positions.

Table 1. Demographic characteristic of Israeli teachers (in percentages)

Gender	Environment	Age	Position status
34.2 Male	16.4 Rural	2 under 25 years	5.3 Permanent
65.8 Female	83.6 Urban	5.9 Between 25-29	94.7 Temporary
		28.3 Between 30-39	
		44.7 Between 40-49	
		17.8 Between 50-59	
		1.3 over 60 years	

Table 2. Demographic characteristic of Romanian teachers (in percentages)

Gender	Environment	Age	Position status
11.2 Male	38.8 Rural	5.1 under 25 years	5.3 Permanent
88.8 Female	61.2 Urban	17.3 Between 25-29	94.7 Temporary
		33.7 Between 30-39	
		23.5 Between 40-49	
		18.4 Between 50-59	
		2 over 60 years	

6.2. Digital competence and wellbeing differences between Israeli and Romanian teachers

Another issue tackled by this research refers to the use of educational technology following two directions. The first one addressed the pre-university teachers' comfort when using technology in their classes, answer options comprising four categories: very uncomfortable, fairly uncomfortable, fairly comfortable and very comfortable. As shown in Table 3, teachers from both groups reported positively regarding their comfort when using technology. For instance, the majority of Israeli teachers' responses indicated educational technology as being fairly comfortable (65.8%), while most of the Romanian teachers considered it very comfortable (57.1%).

The second direction aimed to identify for how many years teachers have been using technology in teaching (Table 4). In this concern, a significant number of teachers from Israel seem to have started earlier, 38.2% using educational technology for 10 to 14 years, while the majority of Romanian teachers (37.8%) for 4 to 5 years.

Table 3. Israeli and Romanian teachers' comfort of classroom technology use (in percentages)

	Israel	Romania
I feel very uncomfortable using technology when teaching	1.3	4.1
I feel fairly uncomfortable using technology when teaching	11.8	3.1
I feel fairly comfortable using technology when teaching	65.8	35.7
I feel very comfortable using technology when teaching	21.1	57.1

Table 4. Israeli and Romanian teachers' time of classroom technology use (in percentages)

	Israel	Romania
1-3 years	10.5	7.1
4-5 years	9.9	37.8
6-9 years	21.1	11.2
10-14 years	38.2	16.3
15-19 years	15.1	11.2
20 years or more	5.3	9.2

It was assumed there is a significant difference between the Israeli teachers and Romanian teachers regarding their digital competence. Table 5 presents a comparison between the two country groups in terms of teachers' digital competence, with the country as an independent variable and the digital competence as a dependent one. The significance level registered was $p<0.05$, meaning there are statistically significant differences between the means of the digital competence variable according to the teachers' country [$F(1, 248)=17.082$, $p<0.05$].

Table 5. ANOVA- differences between the digital competence of the two groups

		Sum of Squares	df	Mean Square	F	Sig.
Digital competence * Country	Between Groups (Combined)	14.728	1	14.728	17.082	.000
	Within Groups	213.836	248	.862		
	Total	228.564	249			

The well-being mean scores for the two groups are shown in Table 6. Israeli teachers' state of mental wellbeing mean score (52.6) is nearer the general population mean of 51, compared with the higher Romanian teachers' well-being mean score of 59.4.

We assumed that there is a significant difference between the Israeli and Romanian groups of teachers. Therefore, we run an ANOVA analysis. The results indicated in Table 7 reflect the existence of a significant difference between the two analysed groups of teachers, with an F value of $F(1, 248)=56.452$ ($p<0.001$).

Table 6. Wellbeing means

Country	Mean	N	Std. Deviation	Median
Israel	52.5592	152	6.86746	53.0000
Romania	59.4184	98	7.31743	60.0000

Table 7. ANOVA- differences between the wellbeing of the two groups

		Sum of Squares	df	Mean Square	F	Sig.
Wellbeing * Country	Between Groups (Combined)	2803.310	1	2803.310	56.452	.000
	Within Groups	12315.314	248	49.659		
	Total	15118.624	249			

Table 8. The relationship between digital competence and the wellbeing attributes

	D C	O	U	R	IP	LE	DW P	CT	GO S	CO	CF	MO M	PL	IT	C
DC	1	.38 4**	.47 8**	.32 7**	.36 9**	.30 4**	.44 0**	.38 6**	.37 3**	.42 7**	.42 1**	.44 0**	.39 8**	.41 9**	.33 1**
O	.38 4**	1	.60 3**	.44 1**	.32 9**	.40 5**	.41 3**	.44 4**	.43 0**	.37 1**	.53 8**	.44 6**	.42 4**	.36 6**	.45 9**
U	.47 8**	.60 3**	1	.44 7**	.43 0**	.44 7**	.46 9**	.46 2**	.45 8**	.47 1**	.59 7**	.53 8**	.54 1**	.46 6**	.47 3**
R	.32 7**	.44 1**	.44 7**	1	.16 6**	.42 4**	.24 1**	.28 5**	.28 3**	.21 0**	.32 1**	.24 9**	.33 9**	.21 6**	.38 2**
IP	.36 9**	.32 9**	.43 0**	.16 6**	1	.32 4**	.47 4**	.48 9**	.38 9**	.51 2**	.43 8**	.47 0**	.50 6**	.50 1**	.42 0**
LE	.30 4**	.40 5**	.44 7**	.42 4**	.32 4**	1	.38 5**	.32 7**	.56 **	.33 3**	.41 0**	.34 1**	.41 4**	.38 3**	.48 9**
D WP	.44 0**	.41 3**	.46 9**	.24 1**	.47 4**	.38 5**	1	.66 7**	.51 4**	.48 5**	.59 0**	.57 3**	.53 4**	.56 9**	.46 1**
CT	.38 6**	.44 4**	.46 2**	.28 5**	.48 9**	.32 7**	.66 7**	1	.57 0**	.45 7**	.55 9**	.59 4**	.55 6**	.50 8**	.51 5**
GO S	.37 3**	.43 0**	.45 8**	.28 5**	.38 9**	.35 6**	.51 4**	.57 0**	1	.52 2**	.61 0**	.57 9**	.53 2**	.44 6**	.51 4**
CO	.42 7**	.37 1**	.47 1**	.21 3**	.52 1**	.33 3**	.48 5**	.45 7**	.52 2**	1	.64 1**	.52 6**	.49 5**	.50 0**	.55 1**
CF	.42 1**	.53 8**	.59 7**	.32 0**	.43 8**	.41 0**	.59 0**	.55 9**	.61 0**	.64 1**	1	.65 0**	.57 2**	.50 2**	.58 8**
M O M	.44 0**	.44 6**	.53 8**	.24 1**	.47 0**	.34 1**	.57 3**	.59 4**	.57 9**	.52 6**	.65 0**	1	.60 4**	.51 2**	.43 5**
PL	.39 8**	.42 4**	.54 1**	.33 9**	.50 6**	.41 4**	.53 4**	.55 6**	.53 2**	.49 5**	.57 4**	.60 4**	1	.59 2**	.61 4**
IT	.41 9**	.36 6**	.46 6**	.21 6**	.50 1**	.38 3**	.56 9**	.50 8**	.44 6**	.50 0**	.50 2**	.51 2**	.59 2**	1	.53 8**
C	.33 1**	.45 9**	.47 3**	.38 2**	.42 0**	.48 9**	.46 1**	.51 5**	.51 4**	.55 1**	.58 8**	.43 5**	.61 4**	.53 8**	1

**. Correlation is significant at the 0.01 level (2-tailed).

A Pearson correlation was run in SPSS in order to analyse the association between the frequency of digital competence and the attributes of wellbeing, namely feeling optimism (O), usefulness (U), relaxation (R), interest in other people (IP) or in new things (IT), level of energy (LE), clarity of thinking (CT), dealing well with problems (DWP), feeling good about one's self (GOS), closeness to others (CO), confidence in the future (CF), making the own mind (MOM), feeling loved (PL) and cheerfulness (C). The results (Table 8) of the analysis indicated that there is a positive correlation between variables which ranges from r=.304 to .478, N=250, p=.000, the size effect being medium.

7. Conclusion

In the light of the presented results, we must conclude that as a consequence of the globalization process we are facing common educational difficulties and share the same solutions. Moreover, an increasing amount of research has been dedicated to the benefits of three-dimensional virtual worlds in

teaching. Virtual reality allows students to create and manipulate 3D objects, travel and examine computer-generated environments, and communicate with peers and teachers by means of avatars (Dalgarno & Lee, 2010). However, research has to be further focused on investigating new and specific pedagogical models based on virtual reality and on the efficacy of models on academic performance as many of the previous studies were conducted from the perspective of information technology solution developers.

In order for all these educational benefits of digital learning to be insured, it is necessary to reduce the gap between the teachers – as digital immigrants and their students - digital natives. Moreover, the digital divide means not only the lack of access to IT resources but also have the digital skills needed to use these resources (Gameel & Wilkins, 2019). Thus, training programs are needed to show teachers how to increase the efficiency of the teaching-learning process in a digital age.

The arguments invoked illustrated the need for innovation and digitalization in the education system, for the training of proactive teachers through wellbeing-oriented programmes.

Nevertheless, we have also to address the limits of the present study. However, researchers should be tentative in generalizing the results of the present research, since this study presents a number of flaws. One limit of the present study is concerned with the self-reported scales used in order to assess digital competence and wellbeing; hence people have the tendency to give answers according to the social norm. Another limit is represented by the convenience sample and future research, in a non-restricted post-pandemic time, should apply probabilistic sampling methods.

Acknowledgments

References

Bauer, J. J., & McAdams, D. P. (2010). Eudaimonic growth: Narrative growth goals predict increases in ego development and subjective well-being 3 years later. *Developmental psychology, 46*(4), 761.

Beetham, H., McGill, L., & Littlejohn, A. (2009). *Thriving in the 21st century*: Learning literacies for the digital age (LLiDA project): Executive Summary, Conclusions and recommendations.

Dalgarno, B., & Lee, M. (2010). What are the learning affordances of 3-D virtual environments? British *Journal of Educational Technology, 41*, 10-32.

Gameel, B. G., & Wilkins, K. G. (2019). When it comes to MOOCs, where you are from makes a difference. *Computers & Education, 136*, 49-60.

Ilomäki, L., Kantosalo, A., & Lakkala, M. (2011). What is digital competence? In Linked portal. *European Schoolnet,* 1-11. http://hdl.handle.net/10138/154423

Jung, T., & tom Dieck, M. C. (2018). Augmented Reality and Virtual Reality. *Empowering Human, Place and Business. Cham: Springer International Publishing*.

Kidger, J., Araya, R., Donovan, J., & Gunnell, D. (2012). The effect of the school environment on the emotional health of adolescents: a systematic review. *Pediatrics, 129*(5), 925-949.

Kidger, J., Brockman, R., Tilling, K., Campbell, R., Ford, T., Araya, R., King, M., & Gunnell, D. (2016). Teachers' wellbeing and depressive symptoms, and associated risk factors: A large cross sectional study in English secondary schools. *Journal of affective disorders, 192*, 76-82.

McMahan, E. A., & Estes, D. (2011). Hedonic versus eudaimonic conceptions of well-being: Evidence of differential associations with self-reported well-being. *Social Indicators Research, 103*(1), 93-108.

Mercer, S., & Gregersen, T. (2020). Teacher Wellbeing. Oxford University Press.

Punie, Y., & Redecker, C., (2017). *European Framework for the Digital Competence of Educators: DigCompEdu*, Publications Office of the European Union. https://doi.org/10.2760/159770

Sampson, D., Ifenthaler, D., Spector, J. M., & Isaías, P. (Eds.). (2018). *Digital technologies: sustainable innovations for improving teaching and learning*. Springer.

Sisask, M., Värnik, P., Värnik, A., Apter, A., Balazs, J., Balint, M., Bobes, J., Brunner, R., Corcoran, P., Cosman, D., Feldman, D., Haring, C., Kahn, J.-P., Poštuvan, V., Tubiana, A., Sarchiapone , M., Wasserman, C., Carli, V., Hoven, C. W., & Wasserman, D. (2014). Teacher satisfaction with school and psychological well-being affects their readiness to help children with mental health problems. *Health Education Journal*, *73*(4), 382-393.

Stewart-Brown, S., Platt, S., Tennant, A., Maheswaran, H., Parkinson, J., Weich, S., Tennant, R., Taggart, F., & Clarke, A. (2011). The Warwick-Edinburgh Mental Well-being Scale (WEMWBS): a valid and reliable tool for measuring mental well-being in diverse populations and projects. *Journal of Epidemiology and Community Health*, *65*(Suppl 2), A38-A39. https://doi.org/10.1136/jech.2011.143586.86

Tennant, R., Hiller, L., Fishwick, R., Platt, S., Joseph, S., Weich, S., Parkinson, J., Secker, J., & Stewart-Brown, S. (2007). The Warwick-Edinburgh mental well-being scale (WEMWBS): development and UK validation. *Health and Quality of life Outcomes*, *5*(1), 1-13. https://doi.org/10.1186/1477-7525-5-63

Walker, D. (2011). *10 best teaching practices*, third edition. Tileston. Corwin Company.

World Health Organization (n.d.). *Mental health*. https://www.who.int/news-room/facts-in-pictures/detail/mental-health