The COVID crisis impact on open education in the field of healthcare management

Panagiotis Bogiatzidis[1,2] · Ioanna Pervou[1]

Abstract

This paper aims to explore how the Hellenic Open University managed to adapt to the new normal of the pandemic and particularly what methods it deployed in its postgraduate Healthcare Management program. The first part introduces the key features of the Hellenic Open University and analyzes the strategic policy deployed by the University during the pandemic through the pillars of academic integrity, openness and excellence. The second part presents the research method and findings regarding both instructors and students of the Healthcare Management postgraduate program. The third part concludes that the policy introduced by University had a positive effect overall both to academic staff and healthcare practitioners. The importance and innovation of this study lies in the fact that it emphasizes on adult students who are in their crashing majority healthcare practitioners and thus have already a saying regarding the pandemic's management. The scope of the research was to demonstrate that this student audience had a significant input in the teaching procedure, since they were at the forefront of the pandemic crisis. In this regard, the instructor-student relationship was more than ever reciprocal based on the knowledge of the first and the experience of the latter.

Keywords Online teaching · Remote teaching · Digital community · Healthcare management · COVID-19

✉ Panagiotis Bogiatzidis
bogiatzidis@yahoo.com

1 School of Social Sciences, Hellenic Open University, Patra, Greece

2 School of Health Sciences, University of Western Macedonia, Kozani, Greece

2️⃣ Springer

1 Introduction

During the last two academic years the scenery in higher education has changed dramatically, due to the outbreak of the COVID-19 pandemic (Yousef Shambour & Abu-Hashem, 2021). The pandemic's spread has placed significant constraints on the educational field, making online or remote education the only practical and available option. Therefore, the quality and academic integrity of online and remote university programs went under severe scrutiny (Whittle at al., 2020).

In this context, Open Universities had a clear lead during the pandemic crisis, since they had already created and implemented effective standard operating procedures (SOPs) and had issued guidelines to foster research integrity in online or remote teaching (Heberling, 2002). Due to their organizational structure, i.e. open learning and distance education (Harry & Perraton, 1999), Open Universities had designed and applied from the very beginning online learning environments, securing both resources and the infrastructure to guarantee the effectiveness of such a teaching environment. Therefore, online learning environment was not circumstantial in their case, compared to the rest higher educational institutions. In other words, Open Universities did not recourse to emergency remote teaching (ERT); rather they continued applying their already designed programs (Lee, Soleimani & Harmon, 2021).

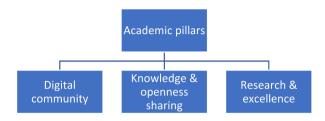## 2 The Hellenic Open University: strategic policy during the pandemic

The Hellenic Open University did not find itself amidst a crisis; instead it addressed the crisis as an opportunity to cement and fortify its qualitative features. This is due to the University's already preplanned online and remote teaching sessions (OSS) and its overall culture and experience in distance learning (Lionarakis, 1996). At this point, a short description of the Hellenic Open University and the contextualization of its role in the Greek landscape of higher education are necessary by way of brief digression. The Hellenic Open University is the 19th Greek state university, the last one established in 1997. Its mission is to provide graduate and undergraduate education and training with minimal entry requirements. This entrance policy has led Open Universities to turn to distance education and training.

Given that the Hellenic Open University is the only state university providing distance learning, it has a particular role to play in higher education in Greece. First, it aims to promote scientific research and develop methodology in the field of distance knowledge transmission. Secondly, it attracts a vast range of students, given that there are minimum requirements for candidacy. As a result it functions too, as a "second-chance" university, offering this opportunity to people who are already in the working force.

Taking into consideration the above, it appears that the Hellenic Open University responded swiftly to the new challenges set by the COVID-19 pandemic. The initiatives taken by the university headed primarily to three pillars, namely (Fig. 1): (a) the creation and empowerment of a digital community, whose main objective is to enhance student communication and build a solid educational environment (Bowen, 2015,); (b) the spread and sharing of knowledge, which allows universities to be open
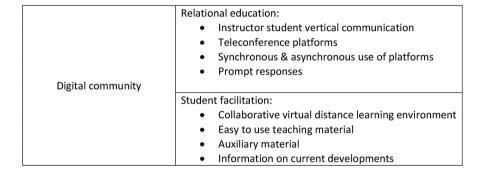
Fig. 1 Strategic policy during the pandemic

Digital community	Relational education:
	• Instructor student vertical communication
	• Teleconference platforms
	• Synchronous & asynchronous use of platforms
	• Prompt responses
	Student facilitation:
	• Collaborative virtual distance learning environment
	• Easy to use teaching material
	• Auxiliary material
	• Information on current developments

Fig. 2 Strategic policy during the pandemic

and share methods and tools with the academic community in general (Homolak, Kodvanj & Virag, 2020), and (c) fostering research and excellence of the academic staff, motivating continuous training and mobility.

2.1 Digital community and student communication (Fig. 2)

The Hellenic Open University has been dedicated to the creation of a broad digital student community for years. Its endeavor is to turn remoteness into an advantage (Eder, 2020). To achieve this goal, particular practices have been enacted.

First, there is the need for uninterrupted and substantial communication between lecturers and students. According to the University's internal code, there is a clear set of time limits which guarantee the existence of a well-founded relation. The educational tool activated mostly to this direction is teleconference platforms. The successful educational use of teleconferences depends on students' familiarization with technology; research concerning the Hellenic Open University has shown that technology familiarity increase students' social presence and willingness to participate (Mavroidis et al., 2013). Therefore, the use of electronic platforms from the University's very institution guaranteed students' and instructors' high acquaintance with this educational tool during the pandemic.

The pandemic enhanced this perspective and thus new tools, such as the use of the Microsoft Teams, have been enacted, along with the use of Discussion Forums, in order to provide a sense of digital community for the students, especially needed during the lockdowns (Mishra, Gupta & Shree, 2020). Electronic platforms served both as synchronous and as asynchronous educational tools: apart from students' preplanned meeting sessions with instructors (OSS), the web rooms of all instructors remained open during academic semester to enhance communication with students, on their demand. Bearing this in mind, it is important noticing that instructors are evaluated for the promptness of their responses to student inquiries. Written and dialogic feedback is considered parts of the relational education process the University attempts to build (Polimeris & Calfoglou, 2021). Therefore, the academic culture of the institution brings forward an active academic community, despite its online character (Ridley & Husband, 1998).

Second, besides online learning platforms, the University has put forward a collaborative virtual distance learning environment, offering to students a series of options, such as: the ability to personalize the webpage by creating user profiles (a), the integration of various information sources in a single web-based user interface (b), content and document functionality (c) (Kambourakis, Kontoni & Sapounas, online). As a result, students have full command over the educational content of their studies and they are able to manage their course over every semester (Nikolaki & Koutsoumba, 2012).

Finally, the institution has made a shift regarding the content and form of teaching material in two ways: lecturers were instructed to upload auxiliary teaching material, to guide students through the curriculum (a), and to inform students on current developments through informative sources, enriching educational material packages during the course (b) (Koustourakis, Panagiotakopoulos & Vergidis, 2008).

These adjustments have also affected exam procedures. Exams in the HOU have always been contacted in person with physical presence in set exam centers over the Greek territory. During the pandemic though, this ability was out of question and exams are held online. The University had to guarantee that remote examination process would meet the requirements of academic integrity and fairness. Therefore, particular steps were taken as soon as the University decided to move to remote exams. Students were informed timely and an examination simulation procedure was available for them, alongside a briefing on the examination process. Additionally, there has been technical support regarding the examination platform and ample information regarding exam methods (Vorvilas et al., 2021).

Platforms of remote examination had also to secure academic integrity and thus the system provided safety valves so that students would not recourse to plagiarism, via Turnitin, and generally that there would be no misconduct during exams (Senel & Senel, 2021,). These added to the creation of an environment promoting justice, excellence and safety as far as personal data protection is concerned (White and Shah, 2017). The University's policy shows aptly that investing in technology is crucial, and proved that academic integrity may be secured through the implementation of technology.

The above demonstrate the primary adjustments made by the University due to COVID-19: material has been updated in order to take account of the pandemic reali-

ties where needed, and the exam procedures as well as the educational activities have adjusted also to the new circumstances (Karakolidou, Leftheriotou & Korres, 2021).

To sum up, as far as digital community is concerned the University invested in technology and managed to build functioning and safe working environments both for students and instructors. With regards to student-instructor communication though, the policy of promptness that is promoted in distance learning in general, and was amplified during COVID-19, brought the peril of students potentially trying to take advantage of their close relationship with instructors. From this angle, knowledge (which involves promptness in its process) and performance are totally separated (Niari & Lionarakis, 2016). The University has managed to dissociate the two and it has not turned to an examination center (Liapis et al., 2021).

Overall, the University's online digital community was not periled by the pandemic; to the contrary it thrived. The University's experience in remote proceedings turned to gained speed. Its digital academic community pioneered during the last two years and substituted for the absence of interpersonal meetings. Thereat, the benefits of its effortless activities exceeded the realms of the institution.

2.2 Spread and sharing of knowledge and institutional openness

Apart from the enforcement of a digital student community, the Hellenic Open University incorporated in its pandemic policy the spread and sharing of knowledge and institutional openness. This policy is built on two levels: the sharing of knowledge between instructors and discussion on current developments and the activation of openness to other academic institutions.
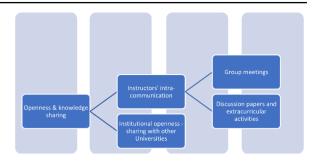
With regards to sharing of knowledge within the realm of the institution, this has been fostered through horizontal communication between instructors. More specifically, lecturers of the same thematic unit are obliged to hold online group meetings at least twice during the semester, in order to exchange teaching practices and exchange education ideas. These meetings are provided by the University's internal guide with the view to standardize the methods and quality of the teaching procedure. Apart from these standard obligations for horizontal communication among instructors, the University initiated during the pandemic the initiative of "discussion papers" according to which instructors of a thematic unit are encouraged to share their pieces of ongoing research, thus creating small fora of academic interaction.

Furthermore, the University decided to increase its extra-curricular activities, like workshops and online conferences. The activities added to its main curriculum, open to anyone interested and not limited to the University community, offered the participants the opportunity to exchange ideas and were a creative way to cope with the pandemic. Therefore, the University's policy aimed to improve knowledge and function as a gateway to the pandemic's difficulties simultaneously (Alvarez, 2020).

On the second level, the Hellenic Open University has taken a milestone decision to share its knowledge with the broader Greek academic community, as far as remote teaching is concerned. This stems from its permanent stance and overall philosophy that openness is central to the promotion of knowledge. Contrary to some who believe that institutional openness might have a detrimental effect to institutional excellence and function as an obstacle to competitiveness, the Hellenic Open Uni-

Fig. 3 Strategic policy during the pandemic

versity decided to share as much as possible. In this regard, it offered its assistance, the online teaching best practices from the very beginning of the pandemic to all the academic institutions, primary education etc. in Greece (Bond et al., 2021).

(Fig. 3)

2.3 Fostering excellence and research

The third pillar which shaped the University's policy during the last two years was to emphasize on academic excellence, both of students and instructors. With regards to students, the Hellenic Open University decided to offer short-term scholarships to students excelling in all their classes during a said semester. This initiative was designed so as to create a motive for students to thrive and reach academic excellence, and to avoid high dropout rates during the pandemic. In general, it favors academic quality, during a time which was most needed (Alachiotis, Stavropoulos & Verykios, 2019).

Applying the same philosophy, the University supported research and secured many grants for its academic staff. It pioneered in research and this was proven by the fact that it ranked first among all Greek universities, concerning the quantity and quality (impact factor) of its staff's publications, while it ranked 3rd worldwide among Open Universities (https://www.webometrics.info/en/search/Rankings/open%20university). To accomplish these achievements the University invested in research by giving access to internationally well-known databases to all academic staff, through their institutional account (Zondiros, Novas & Briana, 2011). This is another long-term investment which promotes academic excellence and integrity. Compared to other Greek state universities, the Hellenic Open University offers a variety of options regarding research, given that its digital library is well-updated (Panitsides & Karapistola, 2020).

The last aspect regarding research promotion is the special focus on research relating to the many aspects of the pandemic. For this reason, the majority of researchers turned to COVID-19 and tried to shed light into this new reality and participate in the global attempt to decode how COVID-19 has changed humanity's course. This effort was part of an aggregate attempt of all faculties and schools. Although healthcare studies were by default on top of this research attempt, all curriculum programs pointed at issues pertaining to COVID-19 and its effects to everyday life (Karalis & Raikou, 2020). Ergo, the University remained on the cutting edge of research on current topics (Fig. 4).

Fig. 4 Strategic policy during the pandemic

The above demonstrate few of the best practices applied by the Hellenic Open University to guarantee academic integrity, openness and excellence during the pandemic. The pandemic's outbreak has led the institution to be elastic in particular circumstances, without compromising quality and integrity. For this reason, the institution has managed to balance between the current needs and adapt to the new reality posed by COVID-19.

3 Research method, participants and limitations

The Hellenic Open University's postgraduate program on Healthcare Management is one of the first programs offered by the University and the first on this field of expertise in Greece. It has a successful course for over ten years and admits around 200 students per intake, and 48 instructors being one of the most popular programs at the time. The program's duration is two years and students follow four mandatory courses before they write their master thesis. The main purpose of the program is to provide knowledge to healthcare unit executives and assist in rational decision-making in the field of healthcare services.

To assess how the COVID-19 pandemic has potentially reframed the teaching procedure in Healthcare Management and whether the policy implemented by the University sufficed for the new challenges ahead, we used qualitative methodology in data collection and subsequent analysis. The method that was followed during this research consists of two parts. First, we opted for non-participatory observation in three preplanned meeting sessions (OSS) of the postgraduate thematic unit Financial and Economic Healthcare Management (DMY 60), with a total of 68 students attending (22 students per meeting). The meetings were not recorded, but we were allowed to take detailed notes. Our observation was non-participatory. Second, we handed out semi-structured interviews with open questions to instructors of the program: on a total of 48, 26 responded. These interviews were based on open questions, in order for instructors to be flexible and express in deep the realities faced during the last two academic years.

The two axes that were central both to our non-participatory observation during the preplanned meetings and to the interviews were how the pandemic has affected

teaching in the postgraduate program, and second how the University's policy response to the pandemic was assessed.

The University did not allow access to personal written communications between students and instructors, and to anything that could impair sensitive personal data.

4 Findings

As far as non-participatory observation in preplanned meeting sessions is concerned, there the issues brought by students during interactive discussion were the following:

- students who are healthcare workers reported with no exception that their working reality has change.
- students reported that they encountered challenges in decision-making in the healthcare units they work.
- they all reported a feeling of anxiety and work overload during the pandemic.
- they mentioned uncertainty emanating from repeated and overlapping changes in the directives they received from the central government.
- a small percentage complained about the change in the exam system.
- many required to undertake COVID-19 related topics for their master theses.

The findings from instructors' interviews with regards to teaching process in the COVID-19 era are as follows:

- they reported that during preplanned meeting sessions students deviated from the standard class topics and required assistance on COVID-19 related management issues.
- they reported that the pandemic was an issue dominating their personal communications with students, although these communications were not disclosed.
- they mentioned that they kept informing students during semesters on the current developments and administrative directions regarding the confrontation of COVID-19.
- they were asked to give managerial advice on real crises in healthcare units.

The key findings from instructors' interviews regarding the University's policy during the pandemic were the following:

- there are not points of concern as far as remote teaching and digital community are concerned.
- there are no problems regarding the use of synchronous and asynchronous tools.
- exam remoteness was not an issue of great concern, since instructors were already familiar to upload exam material online, given that this was the major way in which theses were uploaded and graded.
- there is increase in their workload since they have to keep informed on up-to-date developments in the field of healthcare management.

Fig. 5 Strategic policy during the pandemic

- excessive workload due to the need to prepare upload auxiliary material for students and the organization of extracurricular activities.
- they were satisfied with the promotion of research on COVID-19 related issues and their facilitation through access to databases and occasional funding.

5 Discussion

The effects of COVID-19 on healthcare management have been detrimental, given that all four limbs of healthcare services (i.e. availability, accessibility, uninterrupted function, and end-users' reception in terms of quality, training and appropriateness) (Borkowski, 2016) were severely affected (Pantouvakis & Mpogiatzidis, 2013) (Fig. 5). These changes could not but affect the teaching procedure of the postgraduate program, taking in mind that healthcare practitioners confronted work overload and excessive tiredness (Sizemore, Pefanoff-O'Brien & Skubik-Peplaski, 2021). According to national surveys, healthcare practitioners suffered from burn-out syndrome during the first outburst of the pandemic. The findings are mostly related to the first wave of COVID-19 given that at that time there was almost no knowledge of the cases' treatment and practitioners were full of uncertainty. This uncertainty and their full responsibility over the decisions they have been taking has made their working routine a difficult task to handle (Pappa et al., 2021).

In this respect there have been four main goals set in the post-graduate program to implement the University's policy: (a) to foster research on issues pertaining to healthcare management and the COVID-19 pandemic; (b) to try to listen the students' worries and anxiety, given their professional uncertainty; (c) to offer guidance regarding rational decision-making during a crisis, like a public health emergency; and, (d) to absorb important information by students regarding on-site healthcare management (Peslak et al., 2017).

The above, coupled with research findings indicate that adjustment in the postgraduate programs were not major in terms of digitization – with the exception of remote exams -, given that both instructors and students have already been familiar

with that. The greatest challenges came from the need to adjust to current developments in the field of healthcare: for instructors to incorporate new material, and students to cope with work overload and challenging decision-making in addition to their postgraduate studies. In this respect, the pillars of research and openness are the ones which proved more challenging.

Moreover, students' anxiety due to work increased intensity (Ranghachari & Woods, 2020), this condition posed a challenge to online teaching. That is, how to convince practitioners that doctrinal and theoretical information is of help during such an unprecedented crisis. Students have been doubtful, mainly because of their exposure to uncharted waters. Our role to this end has been to patiently demonstrate that managerial decision-making needs to always be rational and work intensity cannot function as a destabilizing factor to professional performance (Rajab, Gazal & Alkattan, 2020).

The final point relates to student engagement during the outbreaks were the majority of people were in lockdowns while the leaves of healthcare duties were suspended. In this regard, student communication and their engagement in a digital university community was the most important provocation. Students remained active and provided the academic community feedback which was crucial both in terms of research, as well as in terms of fighting against the spread of the pandemic. In other words, sharing their experience fueled academic research (Cabell et al., 2021).

6 Conclusions

The present research has attempted to examine how healthcare management remote teaching has been affected during the COVID-19 pandemic. To thoroughly examine the aspects of this question, one needs to first analyze how a University functions and whether principles like quality and integrity play an important role to its advancement, as well as the peculiarities of the healthcare management profession. Following the above analysis there are three conclusions which may be drawn safely.

First, familiarity with the use of synchronous and asynchronous tools was a privilege and facilitated the teaching process during the pandemic (Chatterjee & Chakraborty, 2021). Second, the field of healthcare management faced the most changes and developments, which in turn required from instructors to keep up with research. Finally, student input and experience had been crucial in achieving academic openness and excellence, given that they were witnessing the pandemic crisis from the inside.

Declarations

Conflict of Interest: The authors have no relevant financial or non-financial interests to disclose.

Declarations the data provided has never been presented before in any conference or other written document.

References

Alachiotis, N. S., Stavropoulos, E. C., & Verykios, V. S. (2019). Analyzing learners behavior and resources effectiveness in a distance learning course: a case study of the Hellenic Open University. *Journal of Information Science Theory and Practice*, 7(3), 6–20

Alvarez, A. V. (2020). The phenomenon of learning at a distance through emergency remote teaching amidst the pandemic crisis. *Asian Journal of Distance Education*, 15(1), 144–153

Bond, M., et al. (2021). Emergency remote teaching in higher education: mapping the first global online semester. *International Journal of Educational Technology in Higher Education*, 18(1), 1–24

Borkowski, N. (2016). *Organizational Behavior in Health Care* (3rd ed.). Jones & Bartlett Learning

Bowen, W. G. (2015). *Higher education in the digital age*. Princeton University Press

Cabell, G. H., et al. (2021). How the COVID-19 pandemic has demonstrated a need for increased leadership education in medicine. *Journal of Healthcare Medicine*, 13, 137–138

Chatterjee, I., & Chakraborty, P. (2021). Use of information communication technology by medical educators amid COVID-19 pandemic and beyond. *Journal of Educational Technology Systems*, 49(3), 310–324

Eder, R. (2020). The remoteness of remote learning: A policy lesson from COVID-19. *Studies in Education*, 9(1), 168–171

Harry, K., & Perraton, H. (1999). Open and distance learning for the new society. In K. Harry (Ed.), *Higher education through open and distance learning* (pp. 1–12). Routledge

Heberling, M. (2002). Maintaining academic integrity in online education. *Online Journal of Distance Learning Administration*, 5(1), 1–7

Homolak, J., Kodvanj, I., & Virag, D. (2020). Preliminary analysis of COVID-19 academic information pattern: a call for open science in the times of closed borders. *Scientometrics*, 124(3), 2687–2701

Kambourakis, G., Kontoni, D. P. N., Sapounas, I., & N.A.). (. Modeling learners' perceptions toward educational portals and collaborative learning tools usage: the Hellenic Open University Case. Online: https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.714.8818&rep=rep1&type=pdf

Karakolidou, E., Leftheriotou, P., & Korres, M. P. (2021). *Facilitating the educational process in synchronous group advisory online meetings in the Hellenic Open University. IT and the Development of Digital Skills and Competences in Education* (pp. 122–143). IGI Global

Karalis, T., & Raikou, N. (2020). Teaching at the times of COVID-19: Inferences and implications for higher education pedagogy. *International Journal of Academic Research in Business and Social Sciences*, 10(5), 479–493

Koustourakis, G., Panagiotakopoulos, C., & Vergidis, D. (2008). A contribution to the Hellenic Open University: evaluation of the pedagogical practices and the use of ICT on distance education. *The International Review of Research in Open and Distributed Learning*, 9(2), 1–18

Lee, J., Soleimani, F., & Harmon, S. W. (2021). Emergency move to remote teaching: a mixed-method approach to understand faculty perceptions and instructional practices. *American Journal of Distance Education*, 35(4), 259–275

Liapis, A. (2021). Evaluating the remote examination process applied by the Hellenic Open University (HOU) during COVID-19 pandemic: students' opinions. 2021 IEEE Global Engineering Education Conference (EDUCON), pp. 924–927

Lionarakis, A. (1996). The establishment of the Hellenic Open University. *Open Learning*, 11(3), 53–58

Mavroidis, I., et al. (2013). Technology acceptance and social presence in distance education – A case study on the use of teleconference at a postgraduate course of the Hellenic Open University. European Journal of Open, Distance and E-learning, 16(2), 76–96

Mishra, L., Gupta, T., & Shree, A. (2020). Online teaching-learning in higher education during lockdown period of COVID-19 pandemic. *International Journal of Educational Research, Open*, 1, 100012

Niari, M., & Lionarakis, A. (2016). The Pygmalion effect in distance learning: A case study at the Hellenic Open University. *European Journal of Open, Distance and e-Learning*, 19(1), 36–52

Nikolaki, E., & Koutsouba, M. I. (2012). Support and promotion of self-regulated learning through the educational material at the Hellenic Open University. *Turkish Online Journal of Distance Education*, 13(3), 226–238

Panitsides, E. A., & Karapistola, A. (2020). Enhancing the role of the Hellenic Open University as a lifelong learning organization: crossing the rubicon into the e-learning era. *International Perspectives on the Role of Technology in Humanizing Higher Education*. Emerald Publishing Limited

Pantouvakis, A., & Mpogiatzidis, P. (2013). Measuring clinical department efficiency – the impact of clinical leadership job satisfaction. An application to public hospitals. *Benchmarking: An international journal*, 20(3), 305–321

Pappa, S., et al. (2021). From recession to depression? Prevalence and correlates of depression, anxiety, traumatic stress and burnout in healthcare workers during the COVID-19 pandemic in Greece: A multi-center, cross-sectional study. *International Journal of Environmental Research and Public Health*, 18(5), 2390–2405

Peslak, A., Conference, et al. (2017). Austin, Texas, USA. ISSN: 2473–3857 v3 n4317

Polimeris, S., & Calfoglou, C. (2021). Distance education feedback in the pandemic: reflecting on HOU student preferences. 11th International Conference in Open & Distance Learning, Athens, Greece, Proceedings, 33–45

Rajab, M. H., Gazal, A. M., & Alkattan, K. (2020). Challenges to online medical education during the COVID-19 pandemic. Cureus, 12(7)

Rangachari, P., & Woods, L., J (2020). Preserving organizational resilience, patient safety, and staff retention during COVID-19 requires a holistic consideration of the psychological safety of healthcare workers. *International journal of environmental research and public health*, 17(12), 4267

Ridley, D. R., & Husband, J. E. (1998). Online education: a study of academic rigor and integrity. *Journal of Instructional Psychology*, 25(3), 184

Senel, S., & Senel, H. C. (2021). Remote assessment in higher education during COVID-19 pandemic. *International Journal of Assessment Tools in Education*, 8(2), 181–199

Shambour, M. K. Y., & Abu-Hashem, M. A. (2021). Analyzing lecturers' perceptions on traditional vs. distance learning: A conceptual study of emergency transferring to distance learning during COVID-19 pandemic. Education and Information Technologies. DOI: https://doi-org.proxy.eap.gr/https://doi.org/10.1007/s10639-021-10719-5

Sizemore, L. M., Pefanoff-O'Brien, S., & Skubik-Peplaski, C. (2021). *Interference: COVID-19 and the impact on potential and performance in healthcare* (pp. 1–8). Work. Preprint

Vorvilas, G., et al. (2021). Remote electronic examinations in the Hellenic Open University (HOU) during COVID-19 pandemic: Student and faculty perceptions. IHE 2021, Higher education in the new normal: the role of online, blended and distance learning, 364–377

White, G. L., Shah, J. The need to teach root cause analysis in an information security course. 2017 Proceedings of the ESDIG, & Conference (2017). Austin, Texas, USA. ISSN: 2473–3857 v3 n4307

Whittle, C., et al. (2020). Emergency remote teaching environment: a conceptual framework for responsive online teaching in crises. *Information and Learning Sciences*, 121(5–6), 311–319

Zondiros, D., Novas, D., Briana, M. Strategic analysis, choice and strategy implementation in a distance education and lifelong learning context: the case of the Hellenic Open University. 6th ICOLD, & Proceedings (2011). Vol. 1, 1–13