Effects of Using E-Learning on Students' Academic Performance in University College of Applied Sciences

Mohammed Salem(✉), Marwan El-Dohdar, Heba Enshasy, Kholoud Serdah, and Ruzan Qazaer

University College of Applied Sciences, Gaza, Palestine
{mzsalem,mdohdar,henshasy,ks3,rqazaer}@ucas.edu.ps

Abstract. In this research, the effect of e-learning on students' academic performance at the University College of Applied Sciences (UCAS) in Gaza, Palestine has been studied, from the students' perspective. The descriptive-analytical approach was used, where a questionnaire was prepared to collect data from a snowball and convenience sample of the UCAS students. The data was obtained from 308 students and analyzed using multiple regression analysis. The results showed that there is an effect of the elements of e-learning (synchronous e-learning systems, asynchronous e-learning systems, and e-learning tools and software) on the students' academic performance at UCAS. While this research builds on prior studies, it also provides results that could aid academics and practitioners in their pursuit of improving the academic performance of students.

Keywords: E-Learning · Academic performance · Palestine · University College of Applied Sciences

1 Introduction

One of the most important components of the economy is the educational sector. Within the education industry, a rivalry has intensified in recent years. As a result, academics and researchers are focusing more on the educational sector [1, 2]. Education is identified as a priority for each individual in this age of globalization and technological change. It plays a crucial role in the growth of human capital and is linked to people's prosperity and opportunities for a better life [3].

E-learning has become an integral aspect of the university curriculum. Some theories have been utilized to investigate the motivational and contextual aspects that impact involvement in instructional activities, such as reasoned action and planned behavior [4, 5]. Universities all across the world have adopted e-learning as a widespread method of delivering instructional resources in higher education, especially during the COVID 19 pandemic. As a result of these developments, there is a growing need for education that may be delivered in a variety of ways. This necessitates the use of distance learning. Even if distance learning was popular long before the internet, technical advancements

B. Alareeni and A. Hamdan (Eds.): ICBT 2022, LNNS 495, pp. 219–230, 2023.
https://doi.org/10.1007/978-3-031-08954-1_20

have allowed ICT to become a more important tool for various types of learning. The World Wide Web has long been used in education as a source of information and even as a learning tool [6]. All of these theories or approaches agree that motivating the learner is critical [7, 8].

Hoffmann [9] proposed that e-learning can take two forms: asynchronous and synchronous. Asynchronous e-learning is primarily self-initiated and takes place at the learner's leisure and their preferred location. It may be done alone using e-books or CD-ROM lessons, or it can be done with others via email, online bulletin boards, and discussion forums. Asynchronous e-learning is contrasted with synchronous e-learning, which involves one or even more learners and a learning facilitator conversing in actual time [10, 11]. The quality of students' learning outcomes is based on their past learning experiences, learning ideas, and study methodologies [12]. Face-to-face, instructor-centered learning is used by a larger percentage of learners in Palestine. The subject of whether the use of ICT in Palestinian education has a good influence on learners' experiences and learning results is being debated. Thus, the objective of this paper is to examine the effect of using e-learning on students' academic performance at UCAS.

2 Theoretical Framework

2.1 Academic Performance

Chang et al. [13] agreed on the same concept of academic performance, learning performance, academic accomplishment, and learning achievement, i.e. the learning outcomes of university students in many topics, or the long-term outcome of learning processes. Academic performance is defined as pupils obtaining information and abilities in universities through specific curricula and resources, which are often shown through examination performance or academic exams [14]. It is also defined as knowledge, understanding, and skills obtained via the professional curriculum and instructional design experience in special education, i.e. persons learning specific material and practicing skills [15]. As a result, learning achievement might be divided into two categories: specialized and generic [16]. Magal-Royo and Lopez [17] classified students' learning records, such as assignments, quizzes, mid-term examinations, and final exams, as generic academic performance. Subject-specific learning performance or the total mean performance of topics was characterized by Chen and Wang [18] as specialized academic performance. Academic performance was, without a doubt, student achievement on the increase of life adaption and physical and mental growth via learning, according to the true meaning of education [18].

2.2 E-Learning System

Asynchronous and synchronous e-learning are the two forms of e-learning. Synchronous e-learning demands the simultaneous participation of all students and teachers in many locations. It attributes to any real-time learning event that incorporates instantaneous two-way contact between participants and is presented to remote learners. As a result, synchronous e-learning is the provision of learning on a set timetable. Learners and instructors do not have to participate in asynchronous e-learning at the same time. It refers to any type of learning that isn't done in real-time [19].

2.2.1 Asynchronous E-learning System

Asynchronous e-learning is a sort of e-learning in which information is supplied as soon as it is needed, giving learners a lot of control over learning time, procedure, and material. Since they are easier to put up and less expensive than synchronous e-learning approaches, many current e-learning systems include asynchronous learning environments [20]. Furthermore, synchronous e-Learning does not provide for schedule flexibility. In comparison to traditional classroom learning, extensive research has demonstrated that e-learning provides significant advantages for learners [21]. Exam marks and student satisfaction have been used in several studies to show that e-learning is effective as of successful as traditional classroom learning [22]. While the majority of the literature stresses the advantages of e-learning, several studies have also highlighted its disadvantages, such as dissatisfaction, misunderstanding, and a loss of interest in the subject matter [23].

Multimedia material delivered over ever-increasing network bandwidth has a substantial influence on learning processes and outcomes. It generates a multi-sensory learning atmosphere that may aid learners to recall more information [24], and urge them to draw attention to a task by presenting information more colorfully and richly [25]. Many students choose online courses due to their asynchronous character, which must be considered. Synchronous e-learning using media such as video conferencing, text messages, and chat, as well as the organization of face-to-face meetings as a supplement, could be required for students to get to meet one another and organize the activities at hand for the discussion of complex subjects. However, asynchronous e-learning using media such as e-mail, discussion forums, and blogging is preferred for discussing tough concepts that take time for consideration [26]. Asynchronous communication allows students to study at their own speed. This communication does not need learners to be present at the same moment to perform teaching and learning activities. Learners in an asynchronous communication environment can participate in a conversation that allows them to access the conference or teaching at various times. As a result, learners may work when and where they choose, at their own pace, giving them extra time thinking about their own ideas and encouraging them to think critically [27]. Based on the aforementioned, we propose the following hypothesis:

H1: Students' academic performance is positively influenced by synchronous e-learning systems.

2.2.2 Synchronous E-learning System

Synchronous e-learning uses several digital technologies and materials, including phone calls and videoconferencing, as well as voice over internet protocol and internet video streaming [28]. Some synchronous e-learning solutions, such as video conferencing and Live Virtual Classrooms, combine two or more synchronous technologies to give a solution with many communication channels [29]. For example, video-conferencing combines video and voice to shorten the time it takes to communicate with people face-to-face, and it is utilized to expedite meetings in businesses and industries, as well as for educational purposes [30]. Live Virtual Classrooms similarly combine video and audio, but they're designed specifically for web-based teaching and education. Therefore, they

contain a variety of different tools, such as collaborative whiteboards, and instruments of resource categorization, as well as contributor response tools, that are designed to enhance interaction and remote learning. Because of technological advancements, e-learning communities may now be developed as either synchronous or asynchronous [31]. Thus, the following hypothesis can be stated:

H2: Students' academic performance is positively influenced by asynchronous e-learning systems.

2.2.3 E-learning Tools and Software

In general, it can be said that e-learning has some tools and software that can only be done through it, namely:

- Computers: An electrical device capable of receiving data and processing it into useful information. It also saves them on various storage media and can often share the findings and information with other devices that are compatible. Operating systems are pieces of software that operate on computers. The computer would be a stiff component without them. Operating systems instruct a computer on how to conduct tasks and frequently provide a platform for programmers to create applications [32].
- LCD, DVD electronic display devices: popularly known as screens are display devices used to display images, texts, and videos transmitted electronically, without permanently recording them. Electronic display devices include televisions, computer monitors, and digital panels, as well as projectors. Electronic displays are also prevalent in all mobile computing applications such as tablets, smartphones, and information devices [33].
- The smartboard: It is a touch-sensitive white electronic display (panel) that is connected to a computer and a data display device and displays and interacts with various computer applications stored on the computer or the Internet, either directly or remotely, using the sense of touch (with a finger, digital ink pens, or any pointing tool). [34].
- Application software and content viewers: It's a type of computer program that takes advantage of the computer's capabilities to carry out the tasks specified by the user. System software, on the other hand, integrates a computer's various capabilities but does not utilize them to carry out user tasks [35].

We suggest the following hypothesis based on the foregoing:

H3: Students' academic performance is positively influenced by e-learning tools and software.

The conceptual framework of the study is depicted in Fig. 1. (1). The independent variables (synchronous e-learning systems, asynchronous e-learning systems, and e-learning tools and software) are linked to the dependent variable in this model (and the UCAS students' academic performance).

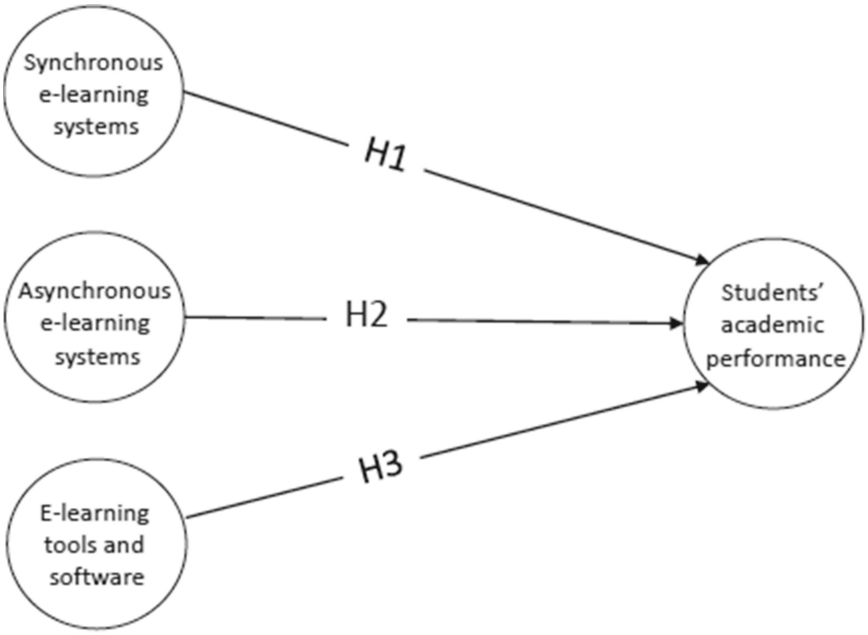

Fig. 1. The research framework

3 Methodology

3.1 Participants

The questionnaire was completed and returned by 308 students in total as shown in Table 1. Males account for 102 of the respondents, while females account for 206. In addition, the table shows the participants' specialty and academic levels.

3.2 Procedures

UCAS students were approached via the researchers' social media networks, where a questionnaire was posted for four weeks. Respondents were invited to share the survey with their colleagues at UCAS. The questionnaire was designed specifically for this study, using Google Form, to collect primary data and test the hypotheses of the current study. As a result, the study's population includes all students at UCAS. For this study, 308 responses were received and analyzed.

3.3 Measures

The survey was conducted using a 5-point Likert scale questionnaire (1 = strongly disagree, 2 = disagree, 3 = no opinion/neutral, 4 = agree, and 5 = strongly agree), and it has four domains. The first domain, designed in reference to Lin and Gao [31], Ogbonna, et al., [19], uses eight items to assess synchronous e-learning. For the second

Table 1. Profiles of the respondents ($n = 308$)

Variables	Groupings	No. of respondents	%
Gender	Male	102	33.1
	Female	206	66.9
Specialization	Technology Management	71	23.1
	Applied Accounting	50	16.2
	Media and Communication Technology	44	14.3
	Nursing	54	17.5
	First Basic Education	43	14.0
	Multimedia	46	14.9
Academic level	First	49	15.9
	Second	75	24.4
	Third	83	26.9
	Fourth	101	32.8

domains, asynchronous e-learning was investigated, seven items were created in line with Lin and Gao [31], Ogbonna, et al., [19], and Hadullo et al., [26]. The third domain included eight items to look at e-learning tools and software [32–34]. The fourth domain evaluated students' academic performance using fifteen items collected from Hanham et al., [35], Rasheed et al., [1], and Liu [16].

4 Results

4.1 Factor Analysis

The KMO and Bartlett's tests were used to determine whether the factor analysis is appropriate for the study purpose. The results of the reliability test should be more than 0.7. Bartlett's Sphericity test findings should likewise be less than 0.05. KMO is 0.758, which is greater than the acceptable threshold of 0.000, suggesting that this analysis is sufficient for the research.

To construct the factor score coefficient matrix produced using principal components analysis [36–38], one principal factor is rotated using the varimax normalization, as shown in Table 2. There are 38 variables in the factor. The research suggests that a loading value of 0.30 is the lowest threshold for item loadings on various scales [39–44]. Table 2 demonstrates that all of the loadings are greater than 0.30, showing that the scales' construct validity is preserved.

4.2 Hypotheses Testing

The relationship between the independent variables (synchronous e-learning systems, asynchronous e-learning systems, and e-learning tools and software) and the dependent

Table 2. Reliability and factor loading of the constructs.

Construct	Item	MV	SD	FL	Cronbach's α
Synchronous e-learning	1	3.97	0.80	.702	.768
	2	3.88	0.91	.647	
	3	3.88	0.87	.629	
	4	3.81	0.83	.626	
	5	3.85	0.96	.653	
	6	3.82	0.96	.592	
	7	4.00	0.84	.704	
	8	3.70	0.86	.637	
Asynchronous e-learning	1	3.76	0.93	.621	.799
	2	4.14	0.72	.636	
	3	3.91	0.82	.618	
	4	3.59	0.97	.735	
	5	3.85	0.90	.5.73	
	6	3.76	0.85	.637	
	7	3.61	0.97	.536	
E-learning tools and software	1	3.98	0.79	.583	.783
	2	3.77	0.98	.641	
	3	3.68	0.93	.584	
	4	3.82	0.79	.672	
	5	3.94	0.79	.683	
	6	3.66	0.93	.648	
	7	3.99	0.74	.573	
	8	3.70	0.96	.538	
Students' academic performance	1	3.46	1.13	.664	.816
	2	3.48	1.08	.695	
	3	3.69	1.02	.573	
	4	3.71	0.87	.579	
	5	3.81	0.90	.595	
	6	3.70	0.88	.673	
	7	3.66	0.95	.703	
	8	3.40	1.15	.682	
	9	3.75	0.85	.688	

(*continued*)

Table 2. (*continued*)

Construct	Item	MV	SD	FL	Cronbach's α
	10	3.92	0.73	.651	
	11	3.79	0.88	.528	
	12	3.41	1.12	.573	
	13	3.66	1.02	.648	
	14	3.67	0.89	.579	
	15	3.64	0.93	.668	

variable (i.e. students' academic performance) was determined using multiple regression analysis. The purpose of the multiple regression analysis was to determine how using e-learning influences students' academic performance.

According to Table 3, the adjusted R2 = 0.518 indicates that the independent factors explain 51.8% of the overall variation in students' academic performance. The model's quality was confirmed since the F value was significant at 0.000. Further research found that synchronous e-learning systems (t = 5.583, p 0.000), asynchronous e-learning systems (t = 2.898, p 0.004), and e-learning tools and software (t = 3.985, p 0.000) were all positively connected to students' academic performance. As a consequence, H1, H2, and H3 were found to be sufficiently supported by the data.

Table 3. Results of multiple regression analysis.

Model		Unstandardized coefficients		Standardized coefficients	T	Sig.
		B	Std. error	Beta		
1	(Constant)	0.097	0.200		0.483	0.629
	Synchronous e-learning systems	0.407	0.073	0.345	5.583	0.000
	Asynchronous e-learning systems	0.200	0.069	0.173	2.898	0.004
	E-learning tools and software	0.318	0.080	0.278	3.985	0.000

Notes: Dependent variable: students' academic performance; adjusted R2 = .518, F = 108.992, and sig. = 0.000

5 Discussion

5.1 Discussion of Findings

The relationship between (synchronous e-learning systems, asynchronous e-learning systems, and e-learning tools and software) and the UCAS students' academic performance is investigated in this study. This was accomplished using the above-mentioned approach and a reliable and validated statistical analysis of the collected data.

The findings show that synchronous e-learning systems have a favorable and significant impact on the students' academic performance. Students may study at their own speed via asynchronous communication. To execute teaching and learning activities, learners do not need to be present at the same time with this communication [26]. In an asynchronous communication environment, learners can take part in a dialogue that allows them to attend the conference or instruction at different times. As a result, students may work whenever and wherever they choose, at their own pace, allowing them more time to think about their own ideas and promoting critical thinking [27].

In addition, the findings identified a relationship between synchronous e-learning systems and the students' academic performance. Live Virtual Classrooms similarly combine video and audio, but they're particularly developed for web-conferencing training and education [29]. As a result, they include a range of tools for enhancing engagement and distance learning, such as collaborative whiteboards, analysis, and resource grouping instruments, and contributor response tools [31].

The findings also indicate that e-learning tools and software have a positive association with the students' academic performance. According to the literature, e-learning has some tools and software that can only be done through it such as computers, LCD, DVD electronic display devices, smart board, and Application software and content viewers. It is difficult to succeed in e-learning without those tools and software [32–35].

5.2 Limitations and Further Research

Contextual and application limitations were among the study's empirical findings. Our findings are based on responses from Gaza-based UCAS students. As a result, it's hard to make broad generalizations across the country's higher education institutions. Even if the findings apply to developing economies with comparable cultural contexts, they may not be suitable for areas with different cultural contexts, such as Palestine. Second, the study was performed in the higher education sector, which limits the results' capacity to be applied to other sectors.

In terms of future research, the researchers recommend that the model could be re-examined in different contexts or cultures. Furthermore, the model may be supplemented by include moderating variables such as students' prior experience to aid in the comprehension of the links and mechanisms underlying the issue at hand. Furthermore, future research should include both professors and students from various universities in the sample.

References

1. Rasheed, H.M.W., He, Y., Khalid, J., Khizar, H.M.U., Sharif, S.: The relationship between e-learning and academic performance of students. J. Public Affairs e2492 (2020)
2. Uzelac, A., Gligorić, N., Krčo, S.: System for recognizing lecture quality based on analysis of physical parameters. Telematics Inform. **35**(3), 579–594 (2018)
3. Boateng, S., Asare, D., Manu, P.T., Sefah, E.A., Adomako, J.: Relationship between students' home background and their academic performance: a case of some selected senior high school students in Rural Districts in Ashanti Region, Ghana. J. Educ. **201**(3), 153–161 (2020). https://doi.org/10.1177/0022057420904370
4. Harandi, S.R.: Effects of e-learning on students' motivation. Procedia Soc. Behav. Sci. **181**, 423–430 (2015)
5. Garavan, T.N., Carbery, R., O'Malley, G., O'Donnell, D.: Understanding participation in e-learning in organizations: a large-scale empirical study of employees. Int. J. Train. Dev. **14**(3), 155–168 (2010)
6. Mahieu, R., Wolming, S.: Motives for lifelong learners to choose web-based courses. Eur. J. Open Dist. E-learn. **16**(1), 1–10 (2013)
7. Salem, M., Baidoun, S.: Factors affecting Palestinian consumer behavioral intentions toward online shopping in light of COVID-19: the moderating role of perceived trust. In: Accepted paper I the 17th Annual International Conference on "the Digital Economy and Business Analytics" (2021)
8. Salem, M.Z., Baidoun, S., Walsh, G.: Factors affecting Palestinian customers' use of online banking services. Int. J. Bank Marketing **37**(2), 426–451 (2019)
9. Hoffmann, J.: The Synchronous Trainer's Survival Guide. Pfeiffer an imprint of Wiley, Hoboken (2004)
10. Dada, E.G., Alkali, A.H., Oyewola, D.O.: An Investigation into the effectiveness of asynchronous and synchronous e-learning mode on students' academic performance in National Open University (NOUN), Maiduguri Centre. Int. J. Mod. Educ. Comp. Sci. **11**(5), 54–64 (2019)
11. Van Dan, N.: The E-Learning Field Book USA. McGrawHill, New York (2004)
12. Gravoso, R., Pasa, A., Mori, T.: Influence of students' prior learning experiences, learning conceptions, and approaches on their learning outcomes, Quality conversations. In: Proceedings of the 2002 Annual International Conference of the Higher Education Research and Development society of Australia (HERDSA), HERDSA (2002)
13. Chang, H.Y., Wu, H.K., Hsu, Y.S.: Integrating a mobile augmented reality activity to contextualize student learning of a socioscientific issue. Br. J. Edu. Technol. **44**(3), E95–E99 (2013)
14. Laine, T.H., Sedano, C.A., Joy, M., Sutinen, E.: Critical factors for technology integration in game-based pervasive learning spaces. IEEE Trans. Learn. Technol. **3**(4), 294–306 (2010)
15. Gentes, A., Guyot-Mbodji, A., Demeure, I.: Gaming on the move: urban experience as a new paradigm for mobile pervasive game design. Multimedia Syst. **16**(1), 43–55 (2010)
16. Liu, H.K.J.: Correlation research on the application of e-learning to students' self-regulated learning ability, motivational beliefs, and academic performance. EURASIA J. Math. Sci. Technol. Educ. **12**(4), 1091–1100 (2016)
17. Magal-Royo, T., Gimenez Lopez, J.L.: Multimodal interactivity in the foreign language section of the Spanish university admission examination. Revista de Educacion **357**, 163–176 (2012)
18. Chen, C.M., Wang, H.P.: Using emotion recognition technology to assess the effects of different multimedia materials on learning emotion and performance. Libr. Inf. Sci. Res. **33**(3), 244–255 (2011)

19. Ogbonna, C.G., Ibezim, N.E., Obi, C.A.: Synchronous versus asynchronous e-learning in teaching word processing: an experimental approach. S. Afr. J. Educ. **39**(2), 1–15 (2019)
20. Azlan, C.A., et al.: Teaching and learning of postgraduate medical physics using Internet-based e-learning during the COVID-19 pandemic–A case study from Malaysia. Physica Medica **80**, 10–16 (2020)
21. Alqudah, N.M., Jammal, H.M., Saleh, O., Khader, Y., Obeidat, N., Alqudah, J.: Perception and experience of academic Jordanian ophthalmologists with E-Learning for undergraduate course during the COVID-19 pandemic. Ann. Med. Surg. **59**, 44–47 (2020)
22. Yekefallah, L., Namdar, P., Panahi, R., Dehghankar, L.: Factors related to students' satisfaction with holding e-learning during the Covid-19 pandemic based on the dimensions of e-learning. Heliyon **7**(7), e07628 (2021)
23. Srivastava, P.: Advantages & disadvantages of e-education & e-learning. J. Retail Market. Distrib. Manage. **2**(3), 22–27 (2019)
24. Mayer, R.E.: Using multimedia for e-learning. J. Comput. Assist. Learn. **33**(5), 403–423 (2017)
25. Troussas, C., Sgouropoulou, C.: Innovative Trends in Personalized Software Engineering and Information Systems: The Case of Intelligent and Adaptive e-learning Systems, vol. 324. IOS Press (2020)
26. Hadullo, K., Oboko, R., Omwenga, E.: Factors affecting asynchronous e-learning quality in developing countries university settings. Int. J. Educ. Develop. ICT **14**(1), 152–163 (2018)
27. Heilporn, G., Lakhal, S., Bélisle, M.: An examination of teachers' strategies to foster student engagement in blended learning in higher education. Int. J. Educ. Technol. High. Educ. **18**(1), 1–25 (2021)
28. Razmak, J., Farhan, W., Refae, G.A.E.: Proposing new innovative technological features to support human e-learning interaction processes in academic organisations. Int. J. Technol. Enhance. Learn. **13**(4), 341–369 (2021)
29. Rapanta, C., Botturi, L., Goodyear, P., Guàrdia, L., Koole, M.: Online university teaching during and after the Covid-19 crisis: refocusing teacher presence and learning activity. Postdigital Sci. Educ. **2**(3), 923–945 (2020)
30. Dwivedi, Y.K., et al.: Impact of COVID-19 pandemic on information management research and practice: transforming education, work and life. Int. J. Inform. Manage. **55**, 102211 (2020)
31. Lin, X., Gao, L.: Students' sense of community and perspectives of taking synchronous and asynchronous online courses. Asian J. Dist. Educ. **15**(1), 169–179 (2020)
32. Muthuprasad, T., Aiswarya, S., Aditya, K.S., Jha, G.K.: Students' perception and preference for online education in India during COVID-19 pandemic. Soc. Sci. Human. Open **3**(1), 100101 (2021)
33. Belaya, V.: The use of e-learning in vocational education and training (VET): systematization of existing theoretical approaches. J. Educ. Learn. **7**(5), 92–101 (2018)
34. Paudel, P.: Online education: Benefits, challenges and strategies during and after COVID-19 in higher education. Int. J. Stud. Educ. **3**(2), 70–85 (2021)
35. Hanham, J., Lee, C.B., Teo, T.: The influence of technology acceptance, academic self-efficacy, and gender on academic achievement through online tutoring. Comput. Educ. **172**, 104252 (2021)
36. Salem, M.Z., Baidoun, S., Walsh, G., Sweidan, N.: The effect of female portrayal in advertising on the Palestinian females purchase decision. J. Islam. Market. **11**(2), 282–300 (2019)
37. Churchill, G.: A paradigm for developing better measures of marketing constructs. J. Mark. Res. **16**(1), 64–73 (1979)
38. Raab, K., Wagner, R., Ertz, M., Salem, M.: When marketing discourages consumption: demarketing of single-use plastics for city tourism in Ottawa, Canada. J. Ecotourism 1–31 (2022)

39. Salem, M.Z., Ertz, M., Sarigöllü, E.: Demarketing strategies to rationalize electricity consumption in the Gaza Strip-Palestine. Renew. Sustain. Energy Rev. **143**, 110956 (2021)
40. Salem, M., Raab, K., Wagner, R.: Solid waste management: the disposal behavior of poor people living in Gaza Strip refugee camps. Resour. Conserv. Recycl. **153**, 104550 (2020)
41. Salem, M.Z.Y.: Factors affecting the demarketing of breastmilk substitutes in Palestine. Breastfeed. Med. **8**(3), 302–311 (2013)
42. Kaiser, H.: The application of electronic computers to factor analysis. Educ. Psychol. Measure. **20**(1), 141–151 (1960)
43. Salem, M.Z.: Démarketing de la consommation d'électricité résidentielle avec les croyances relatives à la législation comme modérateur: une étude de cas sur la bande de Gaza, en Palestine. Revue Organ. Territoires **30**(3), 51–71 (2021)
44. Raab, K., Wagner, R., Salem, M.: "Feeling the waste" evidence from consumers' living in Gaza Strip camps. J. Consum. Mark. **37**(7), 921–931 (2020)