

Educational implications of distance learning within the coronavirus pandemic (COVID-19) from the point of view of university students

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Abstract

The current study aimed to reveal the educational implications of distance learning within the coronavirus pandemic (COVID-19) according to university students' point of view and some variables. The study sample consisted of 3,584 male and female students. The results showed that there are educational effects of high degree distance learning on the total score of the fields of the study tool arranged as follows: possession of skills to deal with smart devices (phones and computers), social growth, academic performance, management of self-learning and motivation to learn, mental growth, development of thinking and research and emotional growth. The most prominent positive effects of distance learning were increasing students' experience in using smart devices and applications in the learning process and their optimal use of them; forming positive trends towards studying, enriching students' knowledge side; informing students about the latest reports and research in their field of specialisation; ease of access for students' information and their search for it; students' perseverance to excel in the study and obtain high rates; students' continuous follow-up to lectures; reliance on self-learning; optimal use of time and effort; and active participation in lectures.

Keywords: Educational implications, distance learning, coronavirus pandemic, Jordanian University students.

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1. Introduction

Today, the world is in a state of heightened alert due to the spread of COVID-19 all over the world, which the World Health Organisation described as a pandemic due to its spread in various countries, leading us to resort to using alternatives to services and rights that must be provided to citizens, including the transition to distance education. In educational institutions and for all educational levels, the sudden transfer of distance education is considered a qualitative leap at the level of Arab countries due to the partial dependence on it before the outbreak of the coronavirus pandemic. On the Jordanian level, and with the issuance of the decision to work in the Defence Law on 3/17/2020, the Jordanian government resorted to fully adopting distance education at the university level, to preserve the health of students and faculty members in conjunction with achieving learning outcomes for the various academic programmes. Facilities for using distance education in teaching included providing free Internet packages to students, establishing a centre for e-learning technology at the level of the Ministry of Higher Education and linking it with e-learning centres in universities and strengthening the Internet in many regions and governorates (Retrieved from the Prime Minister's official website <http://pm.gov.jo/>, dated 9/1/2020). The reliance on distance education in Jordanian universities before the coronavirus pandemic was partial accreditation in some universities due to their dependence on face-to-face education, and in the history of the Hashemite Kingdom of Jordan, there have never been exceptional circumstances such as the coronavirus pandemic that led to complete dependence on distance education in the teaching process, especially since there are specialisations. Applied teaching depends on face-to-face education, and whatever the transition to distance education takes, the achievement of academic programme outcomes remains truncated (Mahasneh, 2015; 2021).

1.1. Theoretical framework

Al-Dulaimi (2018) stated that the first steps for distance education began when the French scientist Charles Toussaint established the first school for distance learning in Germany, in 1856, and it was called the correspondence learning school, after which the United States of America was interested in developing distance education curricula and established schools and universities concerned with distance education and that interest shifted to the Arab countries, as Al-Quds Open University was established in the state of Palestine. With scientific developments in information and communication technology, television and radio broadcasting and the spread of computers and smart devices, the methods of distance education have diversified and there are full and partial interests in distance education in universities indifferent countries of the world. The philosophy of distance education is to provide educational opportunities to all learners who wish to do so and to meet the needs of societies that need a workforce in addition to learners who wish to learn according to their circumstances and needs.

Distance education is defined as the transfer of learning to the learner at his place of residence, instead of the learner moving to the educational institution by various methods and means (Ayasrah, 2022; Mahasneh, 2020d; Resourceful, 2001; Soham, 2009; Tamimi, 2020), such as:

- 1- Method of teaching by correspondence: In this method, multimedia, such as printed materials, audio and image clips, are sent to the students and they are asked to write their notes and inquiries and return them to the teacher. This could be carried out by regular mail or email or via social media (Facebook, WhatsApp and Twitter) or by using computers and smart devices.
2. Synchronous virtual electronic learning method: In this method, the teacher meets with students in a virtual classroom directly by using computers or smart devices and exchanges dialogue, discussion and interaction through various applications (Teams, Zoom and Meet) or social media (Facebook, WhatsApp and Twitter). The teacher can record the lecture for reference when needed.

3. Asynchronous virtual e-learning method: In this method, students can attend recorded lectures and view presentations and files available through various applications and e-learning management systems, using computers and smart devices.

4- The method of education through radio and television broadcasting: where the lectures are broadcasted on radio or television at specific and pre-announced times so that students can attend them.

Reliance on distance education in exceptional circumstances is extremely important and has many positive and negative effects on school and university students. Al-Tous (2020) emphasised that university students pointed out many positives created by distance education, including empowering students to hold activities and events via the Internet that would have required time and efforts to hold them and scrutinise their content if they were inside the university's walls, organise activities in which students from inside and outside Jordan participated with ease, increase the volume of scientific content on the Internet greatly to enrich the scientific content of students and distribute education as much as possible. High flexibility and that the majority of the faculty members made a great effort in the teaching process and that the efficiency of learning increased over face-to-face education for several considerations, the most important was that students have the opportunity to attend the recorded lectures at a time that suits them and with high concentration.

A survey by Ammon newspaper on 10/4/2020 confirmed that university students indicated many advantages of distance education, i.e., distance education opened a space for learning and adaptation outside the university walls and contributed to converging concepts, saved time lost in transportation and traffic congestion, an interactive tool and provided the opportunity to answer any question at any time. A survey by the Jordanian newspaper Al-Rai on 9/8/2020 confirmed that there are psychological and physical effects on children as a result of relying on distance learning. The psychological effects are weakness of direct interaction, loss of the practical part, difficulty of expression, feeling bored, the child's exposure to forgetfulness, sexual exploitation, children's exposure to harmful content and absence of a social spirit. The physical effects are poor eyesight, heart problems, nerve disorders, muscle pain and obesity)(Mahasneh,2020a; 2020b; 2020c).

The sudden transition of distance education has raised many questions among the student, academic and social circles, including Does distance education achieve the learning outcomes of academic programmes? Is distance education an alternative to face-to-face education? Does distance learning achieve the learning outcomes of the courses? Does distance education evaluate students correctly and fairly? Does distance education achieve integrated growth in the student's personality mentally, physically and socially? Is distance education implemented in the best way? Does distance education isolate students socially and contribute to enhancing behaviour among students, such as encouraging others to help with assignments, sit examinations and attend lectures? Is university infrastructure ready to move to distance education? And many other questions arise about the transition to distance education, and from here, this study reveals the educational effects of distance learning according to the coronavirus pandemic (COVID-19) from the point of view of university students and considering some variables.

1.2. Related research

After the researchers reviewed the theoretical literature and previous studies in databases, they found relevant studies on the subject of the study. Mahasneh and Bani Taha (2020) conducted a study on the extent to which private schools in the Shafa Badran area of the capital Amman implement their educational and legal obligations to implement distance education in light of the coronavirus. The researchers used the descriptive and analytical approach with the questionnaire tool. The study sample consisted of 34 parents, and the results of the study showed that 97% of the parents prefer direct education in schools; 3% prefer distance education; 65% confirmed that the distance education methods

used by private schools did not take into account the individual differences between students; 50% confirmed that the special outcomes of the lessons were not achieved through distance education; 70% confirmed that the most prominent problems facing their children during distance education were no simultaneous communication between them and teachers; and 90% confirmed that the methods of distance education, which teachers use to explain the content of books with their children, is sending activities via WhatsApp.

Al-Lily et al. (2020) conducted a study on distance education in response to epidemics: the coronavirus and Arab culture. The study tried to answer the following question: What are the implications of applying distance education amid the coronavirus? By analysing social media posts, lessons and online interviews, the study results showed the emergence of various ramifications. Concerning social and cultural repercussions, some may tolerate, support, reject or accept this education for ideological considerations, through campaigns, rumours and humour. The educational and psychological implications, lack of preparation and incompetence may harm education. In addition, staying home may involve problems (epidemic-related stress, anxiety, depression, domestic violence, divorce and pregnancy), preventing students and teachers from learning and teaching. In terms of procedural and logistical implications, some Arab contexts may be more digitally prepared than non-Arab contexts. In addition, stakeholders may intensify their efforts to profit ethically or unethically from the excessive demand for this education.

Sandhaus et al. (2020) conducted a study on distance e-learning for preclinical studies during the COVID-19 pandemic: a preliminary study of medical students' responses and the potential impact in the future. Researchers examined the responses of preclinical medical students to e-learning in terms of quality and satisfaction with teaching and technical support, attendance of classes and the desire to continue e-learning in the post-pandemic era. A survey of responses was conducted among first-year students at Adelson Medical School, using a structured questionnaire regarding aspects of participation and satisfaction with teaching and the technical components of e-learning. Study results with a 100% response rate showed that they were highly satisfied with the e-learning regarding its quality, online interactions, instructions provided, technical assistance and availability of registration for future studies. Most students (68.6%) indicated a preference for continuing (<90%) online learning in the post-outbreak era. A higher level of overall satisfaction and a lower rate of technical problems during e-learning were significantly associated with a desire to continue learning via the Internet. Among the most prominent conclusions of the study is that the great satisfaction and positive experience of remote e-learning imposed by the COVID-19 epidemic implied a successful transmission and may lead to future changes in preclinical medical studies.

Ali (2020) conducted a study on online and distance learning in higher education institutes: a necessity according to the pandemic, and the results of the study showed that the coronavirus revealed emerging weaknesses in education systems around the world. It is now clear that society needs flexible and resilient educational systems as we face an unpredictable future. A meta-analysis methodology was adopted for this study and relevant literature was visited to capture the essence of continuous learning during these unprecedented times. The results show that universities around the world are moving more and more towards online or e-learning. The results also reveal that regardless of resources, staff readiness, confidence, student accessibility and motivation are important to function in integrated ICT learning. This exploratory paper suggests that employees should use technology and technological tools to enhance learning, especially during these exceptional times. The results also suggest online and distance learning as a necessity in times of lockdown and social distancing due to the COVID-19 pandemic, and it also provides a robust platform for further research.

Abu Shukhidemet al. (2020) conducted a study aimed at revealing the effectiveness of e-learning according to the spread of the coronavirus from the viewpoint of teachers at Palestine Technical University

(Khadouri). The researchers relied on the descriptive and analytical approach through the questionnaire. 50 faculty members at Khadouri University taught during the period of the coronavirus outbreak through the e-learning system. The results of the study showed that the effectiveness of e-learning in light of the spread of the coronavirus was average in four areas (continuity of e-learning, obstacles to the use of e-learning, interaction of faculty members with e-learning and the interaction of students in the use of e-learning on average) among the most prominent recommendations that researchers reached, in addition to holding training courses in the field of e-learning for both teachers and students and helping to get rid of all obstacles that prevent benefiting from the used e-learning system and the need to combine face-to-face education with e-learning in higher education institutions in the future.

Al-Ajlouni (2014) conducted a study on the educational effects of the use of the Internet by students at Arab Open Universities, Jordan Branch. The researcher used the descriptive survey method through the persistence tool after making sure of its validity and stability, and the study sample consisted of 787 male and female students, and the results of the study showed that there are educational effects of the use of the Internet at a high degree in the following areas: motivation and planning for learning, learning experiences and skills, methods of thinking and research, academic achievement and creativity and the cultural domain. The existence of statistically significant differences in education affects the attributed variables of students' specialisation, in addition to the absence of differences of effects on the gender variable.

1.3. The study problem and questions

On 3/17/2020, the government of the Hashemite Kingdom of Jordan announced the implementation of the defence law due to the coronavirus pandemic, and the use of distance education was used and fully accredited in universities due to the exceptional circumstances the country was going through, and no such decision has been taken before in the history of the Jordanian state. As a result of this decision, Jordanian public and private universities rushed to use distance education in several ways as an alternative to face-to-face education within educational institutions, and the government and universities worked to provide facilities for students and faculty members for the success of distance education and given the researcher's experience in distance education and as an evaluation of the experience, this study came to reveal the effects of distance learning education according to the coronavirus pandemic (COVID-19) from the point of view of university students and some variables. The study tried to answer the following questions:

First question: What are the educational effects of distance learning according to the coronavirus pandemic from the point of view of university students?

Second question: Are there statistically significant differences at the level of significance ($\alpha = 0.05$) in the educational effects of distance learning according to the coronavirus pandemic due to the following variables: gender and student specialisation?

1.4. Purpose of the study

The study aims to achieve the following:

1. Explain the educational effects of distance learning from the point of view of university students.
2. Provide researchers and students the opportunity to conduct practical research on the educational effects of distance education at the level of universities, schools and training centres.
3. Build a frame of reference for educational institutions on the implications of distance learning on university students to evaluate the experience and take into account the important educational matters revealed by the study during the use of distance learning.

4. Expose the effectiveness of using distance education among Jordanian university students.

2. Method and materials

The researcher used the descriptive survey method through the tools of collecting data and information (questionnaire) after confirming their psychometric properties.

2.1. Participants

The study sample consisted of 3585 male and female students from public and private universities, and they were chosen by the available sample method. Table 1 shows the characteristics of the study sample.

Table 1. Characteristics of the study sample

Variable	Level	Number
Gender	Male	2082
	Female	1502
	Total	3584
Specialisation	Sciences	1661
	Humanities	1923
	Total	3584

Data analysis.

2.2. Data collection process

2.2.1. Instrument

To answer the study questions, the researcher used the questionnaire tool to collect data and information after confirming its psychometric properties. The study tool consisted in its final form 46 paragraphs distributed into 7 domains.

2.2.2. Validity of instrument

First: The veracity of the arbitrators

After reviewing the theoretical literature and previous studies by the researcher and obtaining assurances from students about the educational effects of distance learning in light of the coronavirus pandemic from the viewpoint of university students, the questionnaire tool was built in its initial form and presented to many seven arbitrators to express their opinion on appropriateness of domains and paragraphs in terms of appropriateness of domains and paragraphs for the goal that they were set for their suggestions on adding other domains or paragraphs, making sure of the linguistic wording of the domains and paragraphs and the observations of all the referees were taken and the study tool in its final form consisted of 46 paragraphs distributed into 7 domain factors listed using the 5-point Likert scale (ranging from Strongly Agree, Agree, Neutral, Disagree to Strongly Disagree).

Second: Internal consistency

The tool was presented to an exploratory sample of 20 male and female students to calculate the internal consistency coefficients between the domain's items and the overall tool. The correlation coefficients ranged between 0.96 and 0.89.

2.2.3. Reliability of the instrument

The coefficient of overall stability was found for the tool using Cronbach's alpha, as shown in Table 2.

Table 2. Reliability statistics

Cronbach's Alpha	N of items
0.823	46

Data analysis

Table 2 shows that the overall stability coefficient of the tool reached 0.82, and this indicates that the tool has a high degree of stability.

2.3. Data analysis

The arithmetic means and standard deviations for each paragraph and domain were found in addition to the analysis of covariance (ANCOVA) through the statistical analysis programme SPSS. To judge the educational effects of distance learning, the following criterion was adopted:

- If the average is 3.67–5, then the educational effects of distance learning are high.
- If the average is 2.34–3.66, then the educational effects of distance learning are moderate.
- If the average is 1–2.33, then the educational effects of distance learning are low.

3. Results and discussion

3.1. Results related to the first question

To answer the first question, which states: What are the educational effects of distance learning according to the coronavirus pandemic (COVID-19) from the point of view of university students? The arithmetic averages and standard deviations were calculated for the domains of the educational effects of distance learning from the students' point of view. Table 3 shows the domains of the educational effects, their arithmetic averages and their overall estimates.

Table 3. Domains of educational effects, their arithmetic averages and their overall estimates

N	Domains of educational effects	Mean	Estimation of effect	Rank
1.	Academic performance	3.88	High	3
2.	Have the skills to deal with smart devices (phones and computers)	4.40	High	1
3.	Managing self-learning and learning motivation	3.83	High	4
4.	Development of thinking and research	3.64	High	6
5.	Social growth	4.00	High	2

6.	Mental development	3.76	High	5
7.	Physical growth	2.27	Low	7

Data analysis

Table 3 shows that the educational effects of distance learning after having the skills to deal with smart devices (phones and computers) obtained the highest arithmetic average, which reached 4.40 with a high rating, and the researcher attributes that to the fact that the method of distance education used was synchronous and asynchronous e-learning. This requires the student to deal with smart devices. Distance education has contributed to providing students with the skills of dealing with devices and using them to achieve the educational objectives of the courses. It was followed by the educational effects of the social growth domain in second place, as its arithmetic average reached 4.00 with a high rating. The researcher attributes this to the establishment of faculty members and students themselves for groups through social media or various applications, which contributed to the formation of social relationships and continuous communication between students themselves and between students and teaching staff members. The results related to that domain also showed that distance education has lost students' face-to-face communication with each other and with their teachers to acquire communication and communication skills and positive behaviours, and this is considered one of the negative effects of distance education. In third place was the educational effects of distance education after the academic performance, as it obtained an arithmetic average of 3.88 with a high rating, and the researcher attributes this to the contribution of distance education in raising students' academic achievement because the student carries out assignments and examinations remotely without supervision by faculty members. Also, students study and follow the lectures with their freedom and under the conditions they deem appropriate. In fourth place was the educational effects of distance education after the administration of self-learning and motivation to learn, as it obtained an arithmetic average of 3.83 with a high rating, and the researcher attributes that because distance education stems from the principles and ideas of constructive philosophy in making the student the focus of the educational process, so he relies on himself in planning Preparing and solving duties and carrying out various activities, and this is what has been achieved as a result of the use of distance education. In fifth place was the educational effects of distance education after mental growth, with an arithmetic average of 3.76 and a high rating, and the researcher attributes that because distance education made it easier for students to obtain references and information and the student's attendance of recorded lectures, which contributed to expanding their perceptions, understanding information and analysing it. In sixth place was the educational effects of distance education after developing thinking and research, as it obtained an arithmetic average of 3.64 with an average rating. The researcher attributes that to the fact that distance education contributed to students' search for information on their own and used their thinking to solve the problems they faced. In the last place was the dynamic growth of the educational effects of distance education, which achieved the lowest arithmetic average, reaching an average of 2.27 with a low grade, and the researcher attributes that because the practical skills of the courses cannot be achieved through students' practice of them, and this is not achieved through distance education. Tables 4–10 show the arithmetic averages, standard deviations and the assessment of the effects for each paragraph in the domain and the overall domain.

3.2. The first domain: academic performance

Table 4. Arithmetic averages, standard deviation and estimation of impacts for the academic performance domain

N	Domains of educational effects	Mean	Standard deviation	Estimate of effects
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The first domain: academic performance

Distance education contributed to:

1.	I get high marks.	4.50	0.500	High
2.	My perseverance to excel in the field of study.	4.00	0.813	High
3.	Presenting creative activities and assignments in the various courses.	3.83	0.693	High
4.	Absorb information easily due to its availability at any time.	4.01	0.575	High
5.	My understanding of the matters related to the teaching process.	3.85	0.684	High
6.	My analysis of the results of the tests and linking them to the outcomes that were achieved for me.	4.18	0.684	High
7.	Follow up on my activities independently.	3.35	1.100	Average
8.	Hiring others to provide examinations, assignments, and activities.	2.52	1.254	Average
9.	Ease of interaction with teachers and classmates in lectures.	4.78	0.578	High
	Total	3.88	0.36	High

Data analysis.

Table 4 shows that the arithmetic average of items after academic performance reached 3.88, as the educational effects of distance learning related to the domain of academic performance are high. Paragraph 'I got high marks' obtained the highest average arithmetic, and the researcher justifies this from his experience during distance education that the majority of students are keen on obtaining high grades and it is considered an opportunity for them to achieve this, as they were interested in studying more than their presence in the classroom. As this also strengthened the interest of the Ministry of Higher Education and Scientific Research and the heads of Jordanian universities to provide all means for students to access distance education in an ideal way, the provision of free Internet packages for students contributed a strong motivation for them to follow the lectures, especially since the majority of students owned smartphones and other computers, and that the keenness of the faculty members to provide the lectures in an ideal manner contributed to achieving the desired educational results. This result is consistent with Al-Ajlouni's(2014) study .

Table 4 shows the following positive effects of distance learning in the field of academic performance: students obtain high marks, perseverance of students to excel in the field of study, students' provision of creative activities and assignments in various courses and students' assimilation of information easily due to its availability at any time. For matters related to the teaching process, the effects were students' analysis of test results and linking them to the outcomes achieved for them, students; independent follow-up of their activities and ease of student interaction with teachers and their classmates in lectures. As for the negative effects of distance learning in the field of academic performance, students used others to submit exams, duties and activities on their behalf.

3.3. The second domain: possessing skills to deal with smart devices (phones and computers)

Table 5. Arithmetic means, standard deviation and estimation of the effects of having skills in dealing with smart devices (phones and computers).

N	Domains of educational effects	Mean	Standard deviation	Estimate of effects
The second domain: possessing skills to deal with smart devices (phones and computers)				
Distance education contributed to:				
1.	Make the best use of smart devices in the learning process.	4.13	0.472	High
2.	My use of various educational applications is necessary for the learning process.	4.48	0.517	High
3.	Learn about the technical methods and tools used in the learning process.	4.32	0.521	High
4.	Increase my experience in the use of smart devices in the learning process.	4.95	0.419	High
5.	Perceptual expansion of enrollment in courses, workshops, and training activities remotely.	4.14	0.420	High
	Total	4.40	0.29	High

Data analysis.

Table 5 shows that the arithmetic average of items after possessing the skills of dealing with smart devices (phones and computers) reached 4.40 as the educational effects of distance learning related to the domain of possession of skills to deal with smart devices (phones and computers) (high). Paragraph 'Distance education contributed to the increase of my experiences in the use of smart devices in the learning process' had the highest average arithmetic, and the researcher justifies that to the fact that the method of distance education used was synchronous and asynchronous electronic learning and this requires the student to be aware of the different applications used in the educational process. In addition to the fact that the majority of university students own smartphones and special computers, distance education has worked to increase students' experience in using smart devices to serve the educational process. This result is consistent with Al-Ajlouni's (2014) study.

Table 5 shows the following positive effects of distance learning in the field of possessing skills to deal with smart devices (phones and computers): students' optimal use of smart devices in the learning process; the use of various educational applications necessary for the learning process; students' acquaintance with the methods and technical tools used in the learning process; increasing students' experience in using smart devices in the learning process; and expanding students' perceptions to join courses, workshops and training activities remotely.

3.4. The third domain: self-learning management and learning motivation

Table 6. Arithmetic means, standard deviation and impact estimation of the self-learning management and learning motivation domain

N	Domains of educational effects	Mean	Standard deviation	Estimate of effects
The third domain: self-learning management and learning motivation.				

Distance education contributed to:

1.	Prepare for lectures well.	4.28	0.601	High
2.	Continuously follow-up my lectures.	4.30	0.777	High
3.	My dependence on self-learning.	4.14	0.693	High
4.	Better organise the study programme.	4.32	0.486	High
5.	Save time and effort in studying.	4.82	0.406	High
6.	Accurate decision-making for different activities.	4.65	0.495	High
7.	Choose the appropriate learning style for me.	4.46	0.596	High
8.	Using others to attend lectures.	2.17	1.077	Low
9.	It was not possible to attend some lectures due to the poor internet.	2.05	1.202	Low
10.	Some exam questions could not be answered due to the poor internet.	3.19	1.360	Average
11.	Active participation during the lectures.	3.85	0.684	High
Total		3.88	0.29	High

Data analysis.

Table 6 shows that the arithmetic means of the items after managing self-learning and motivation to learn reached 3.83, as the educational effects of distance learning related to the domain of self-learning management and the motivation to learn are high. Paragraph 'Distance education contributed to saving time and effort in the study' received the highest average arithmetic, followed by the paragraph 'Distance education contributed to the decision-making of various activities accurately'. The researcher justifies this because the use of distance education has made the student the focus of the educational process, as students' learning in distance education depends on their learning. The majority of students are keen to benefit from the lectures to preserve their academic achievement.

Table 6 shows the following positive effects of distance learning in the field of self-learning management and motivation to learn as follows: students prepare well for lectures and follow-up for lectures on an ongoing basis; students' reliance on self-learning; better organising the study programme; and saving time and effort. In the study, accurate decision-making in different activities, students' learning according to the appropriate learning style for them and active participation during the lectures were high. As for the negative effects of distance learning in the field of self-learning management and the motivation to learn, the students' used others to attend the lectures and some could not attend some lectures and answer exam questions due to the weakness of the internet.

3.5. The fourth domain: the development of thinking and research

Table 7. Arithmetic means, standard deviation and estimation of the effects of the thinking and research development domain

N	Domains of educational effects	Mean	Standard deviation	Estimate of effects
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The fourth domain: the development of thinking and research

Distance education contributed to:

1.	Searching for information is easy and with less time and effort.	4.48	0.597	High
2.	Obtaining references and sources electronically.	4.16	0.714	High
3.	I have benefited from the experiences of my colleagues and others in research and making scientific reports.	2.65	1.474	Average
4.	My motivation is to analyse information and ideas to obtain scientific solutions to problems related to my study.	3.65	0.942	High
5.	Using the scientific method to solve problems.	3.77	1.110	High
6.	Access to the latest scientific research and reports in my field of study.	3.16	1.090	Average
	Total	3.64	0.39	High

Data analysis.

Table 7 shows that the arithmetic means of the paragraphs after developing thinking and research reached 3.64 as the educational effects of distance learning related to that domain are high. Paragraph 'Distance education contributed to searching for information easily and with the least time and effort' had the highest arithmetic average, followed by paragraph 'Distance education contributed to obtaining references and resources electronically'. The researcher justifies this because the use of distance education encouraged the students to search for solutions to the problems they faced, with the appropriate method according to health conditions used in information and communication technology, in addition to relying on self-knowledge. This result is consistent with Al-Ajlouni's (2014) study.

Table 7 shows the following positive effects of distance learning in the field of thinking and research development as follows: students search for information easily and with less time and effort; students obtain references and resources electronically and benefit from the experiences of their colleagues and others in research and making scientific reports motivating students to analyse information and ideas to obtain scientific solutions to problems related to the study; students' use of the scientific method to solve problems; and informing students of the latest scientific research and reports in their field of study.

3.6. The fifth domain: social growth

N	Domains of educational effects	Mean	Standard deviation	Estimate of effects
The fifth domain: social growth				
Distance education contributed to:				
1.	Make friends with my colleagues.	2.95	1.172	Average
2.	Creating groups for each course facilitates understanding of the course topics.	4.12	0.799	High
3.	Express problems correctly in front of teachers and students.	2.35	1.100	Average
4.	Commitment to the lecture date.	4.44	0.679	High

5.	Continuous communication with course instructors.	4.62	0.586	High
6.	Form positive attitudes towards my studies.	4.79	0.542	Average
7.	Avoid direct communication with my colleagues and teachers to gain communication skills, communication and positive behaviours.	4.80	.460	High
Total		3.64	0.33	High

Table 8. Arithmetic means, standard deviation and estimation of impacts for the social growth domain
Data analysis.

Table 8 shows that the arithmetic means of the items after social growth reached 4.00 as the educational effects of distance learning related to that domain are high. Paragraph 'My exclusion from direct contact with my colleagues and teachers to gain communication skills, communication and positive behaviours' had the highest average arithmetic. The researcher justifies this because the use of distance education has made students lose their communication skills and face-to-face communication with faculty members and students themselves, and this is considered one of the disadvantages of using distance education. This result is consistent with Al-Tous' (2020) study.

Table 8 shows the following positive effects of distance learning in the field of social development as follows: students form friendly relations with each other; students form groups for each course of study that facilitates their understanding of the course's topics; students' expression of the problems they face correctly in front of teachers and students; students commit to the lecture date; students communicate continuously with course instructors; and students form positive attitudes towards their studies. As for the negative effects of distance learning in the field of social development, students were kept from direct contact with their colleagues and teachers to acquire communication and communication skills and positive behaviours.

3.7. The sixth domain: mental development

Table 9. Arithmetic means, standard deviation and estimation of effects for the mental development domain

N	Domains of educational effects	Mean	Standard deviation	Estimate of effects
The sixth domain: mental development				
Distance education contributed to:				
1.	Get adequate information related to the course.	4.17	1.217	High
2.	Frequent attendance of recorded lectures further widened my perceptions.	4.49	0.768	High
3.	I own the course outputs.	2.67	0.949	Average
4.	My detailed reading of all the subjects of the courses.	3.36	0.498	High
5.	Enriching my knowledge side.	4.16	0.367	High
Total		3.76	0.33	High

Data analysis.

Table 9 shows that the arithmetic means of the items after mental development reached 3.76 as the educational effects of distance learning related to that domain are high. Paragraph 'Frequent attendance of recorded lectures increased my perceptions expansion' had the highest average arithmetic. The researcher justifies this because the use of distance education facilitated recording and publishing lectures for students so that they could attend the lectures more than once, which contributed to focusing information on their minds. The result is confirmed by the findings of the poll of the Jordanian newspaper Amoun on 10/4/2020.

Table 9 shows the following positive effects of distance learning in the field of mental development as follows: students obtain adequate information related to the course; repeat students attending recorded lectures increased perceptions; students' possession of course outcomes; and students' detailed reading of all subjects of the courses enriched their knowledge.

3.8. The seventh domain: physical growth

Table 10. Arithmetic averages, standard deviation and estimation of effects for the motor growth domain

N	Domains of educational effects	Mean	Standard deviation	Estimate of effects
The sixth domain: Physical growth				
Distance education contributed to:				
1.	I possess specialised practical skills.	2.22	0.942	Low
2.	Understand the mechanism of dealing with materials and tools that have to do with practical skills.	1.87	0.734	Low
3.	Change my outlook for gaining practical skills.	2.72	1.136	Low
Total		2.27	0.71	Low

Data analysis.

Table 10 shows that the arithmetic means of the paragraphs after mental development reached 2.27 as the educational effects of distance learning related to that domain are low. Paragraph 'Distance education contributed to changing my view of acquiring practical skills' got the highest average arithmetic, followed by paragraph 'Distance education contributed to my possession of specialised practical skills'. The researcher justifies this because the use of distance education hinders the implementation of experiments by students in a practical manner, as skills are learned by doing and practice.

Table 10 shows the following negative effects of distance learning in the field of motor development as follows: poor possession of specialised practical skills; poor understanding of the mechanisms of dealing with materials and tools that have to do with practical skills by students; and changing students' perceptions of acquiring practical skills.

3.9. Results related to the second question and discussion

To answer the second question, which states: Are there statistically significant differences at the level of significance ($\alpha = 0.05$) in the educational effects of distance learning in light of the

coronavirus pandemic due to the following variables: gender and student specialisation? ANCOVA was used, as shown in Table 11.

Table 11. Tests of between-subject effects

Dependent Variable: total

Source	Type III sum of squares	df	Mean square	F	Sig.
Corrected Model	67,759.661 ^a	3	22,586.554	276.176	0.000
Intercept	103,795,610.727	1	10,379,610.727	1,269,154.799	0.000
Gender	58,420.885	1	58,420.885	714.338	0.000
Major	4,007.122	1	4,007.122	48.997	0.000
Gender * Major	8,690.926	1	8,690.926	106.268	0.000
Error	292,784.053	3,580	81.783		
Total	109,952,608.000	3,584			
Corrected total	360,543.714	3,583			

Data analysis.

^a $R^2 = 0.188$ (Adjusted $R^2 = 0.187$).

Table 11 shows that there are no statistically significant differences at the level of significance ($\alpha = 0.05$) between the mean educational effects of distance education due to the variables of gender and student specialisation and the interaction between them, as the value of the significance level for the variables is 0.00, which is lesser than the value of $\alpha = 0.05$. The researcher attributes this to the fact that distance education is used by both sexes and for all scientific and human disciplines, and they all surround the same health and psychological and social conditions.

4. Recommendations

According to the research results, the researcher recommends the following:

1. Those concerned in the Ministry of Higher Education and Scientific Research and universities should develop methods of distance education and take into account the educational effects reached by the study during their use of distance education.
2. Conduct similar studies on the subject of the study to compare the results.

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