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Online and Face-to-Face Learning during COVID-19 Pandemic: A Comparative Analysis of Instructors and Student's Performance

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Abstract

The COVID-19 pandemic necessitated a sudden shift to online learning, prompting discussions on its effectiveness compared to traditional face-to-face methods, especially in higher education contexts. This study explores the perception of teachers and students regarding online learning's advantages, disadvantages, and recommendations. A quantitative case study was conducted from April to December 2021, involving 81 participants (teachers and students) from various disciplines, including science, law, administration, agriculture, and economics. Data were analyzed using Pearson's correlation and Chi-square tests with SPSS version 25. The study identified that online learning offers flexibility and supports lifelong learning. However, inefficiencies were noted in teaching practical skills, and significant weaknesses were observed in student-teacher and student-student interactions.

Additionally, online learning posed challenges in preventing academic dishonesty. The findings highlight the need for improved strategies to enhance interaction, practical skill development, and quality assurance in online education. Policymakers and educators should consider these insights to develop more robust online learning frameworks.

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INTRODUCTION

The COVID-19 pandemic has significantly impacted education, with many schools and universities shifting to remote or online learning. This has presented challenges for students and educators, including difficulties with technology and internet access and a need for more interaction and engagement than in-person learning (Almaiah et al., 2020; Priadi et al., 2021; Yuningsih et al., 2021. However, many institutions have also implemented innovative solutions and adapted to the new environment. Some research has suggested that online learning can be as effective as in-person instruction (Adedoyin & Soykan, 2020). Overall, the pandemic has highlighted the need for flexibility and adaptability in education and the importance of access to technology and resources for all students (Gelles et al., 2020; Torda & Shulruf, 2021; Maatuk et al., 2022).

The education sector in Kurdistan has been one of the hardest hits owing to the pandemic, which has deeply affected learning outcomes for children (Budur, 2020). The government of Kurdistan

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implemented a lockdown in March to close schools, colleges, and universities, including all educational institutions (Amin, 2021; Budur et al., 2021). Many universities and colleges worldwide suspended classroom teaching due to the COVID-19 pandemic and switched to online teaching (Müller et al., 2021). Many educational institutions have shifted to online classes through Zoom, Google Meet, and Google Classroom. In Kurdistan, online classes are new to many colleges (teachers and students). Better access to electricity and internet service is needed in most parts of the region. In this scenario, it is important to understand how students perceive and react to the practice of online classes and how to apply these approaches most effectively to enhance the effectiveness of online classes compared to face-to-face classes. Furthermore, there have been concerns about the quality of online education and the need for more engagement and interaction with teachers and peers. The KRG has also been criticized for inadequate planning and coordination in response to the pandemic, which has led to disruptions in the education system.

Overall, the pandemic has highlighted the need for more investment in education and technology infrastructure in the KRI and more effective planning and coordination to ensure the continuity of education during crises. Several types of research are undertaken to identify the impact of COVID-19 on education sectors. Kemp & Grieve (2014) compare undergraduates' preference for and academic performance on class material and assessment presented online vs. in traditional classrooms. Turnbull et al., (2021) shared the challenges faced in the rapid transition from face-to-face to online teaching due to the COVID-19 pandemic. They highlighted the integration of synchronous learning tools into technology. Mukhtar et al. (2020) explore the perception of teachers and students regarding online learning advantages, limitations, and recommendations. Online learning modalities encourage student-centred learning and are easily manageable during this lockdown. Neupane et al. (2020) Assess the readiness of online classes among students. Mohammad & Kamran, (2023) Found out students' perception of online-class during the COVID-19 pandemic. Wu (2021). Explore the design of online teaching activities and online teaching processes adopted by teachers at all levels (College, Secondary, elementary) schools during the pandemic. Atwa et al. (2022) conducted a study to examine faculty and medical students' perceptions of online, face-to-face, or blended learning during the COVID-19 pandemic. Tang et al. (2021) conducted a comparative analysis of students' readiness for live online learning during the pandemic in higher education. Zheng et al., (2021) research in dental education demonstrates that online courses conducted during the pandemic can deliver student performance outcomes comparable to, or even surpass, those of traditional face-to-face courses conducted before the pandemic. Foo et al. (2021) conducted a comparative study to evaluate the effectiveness of distance and face-to-face learning in problem-based learning tutorials. The study found no significant difference in students' performance between the two approaches.

Similarly, Zheng et al. (2021) conducted a school-wide comparative study and found that online learning produced equivalent or better student course performance than pre-pandemic levels. Said (2021) investigated the impact of the COVID-19 pandemic on the learning experience of university students in a developing country. Finally, Zapata-Cuervo et al. (2022) conducted a comparative analysis of students' psychological perceptions of online learning engagement and outcomes across three countries.

These studies have shown that online learning has a profound positive impact on student learning. However, some college students prefer online learning methods that encourage student learning and are easily administered in an enclosed setting. The results of these studies showed that most students from different faculties attended online classes during the pandemic, and most of them had significantly more access to the Internet at home than students who did not have Internet access at home. There are differences between online learning and traditional learning. Despite some of the shortcomings of online classes, such as lack of internet connection, quality, and reliability of learning, online learning is a good alternative in some university situations. They feel safe and secure in terms of payment, and despite continuing their studies, it saved the students from the risk of transmission of the COVID-19 pandemic. Some of these studies only focused on a specific college, such as medical colleges,

or only explained the subject in terms of theory. Given these gaps, we considered conducting a practical study involving most scientific and literary colleges. Therefore, the purpose of this research is to explore the perceptions of teachers and students regarding the advantages, disadvantages, and recommendations of online learning.

METHOD

The research collected primary data to solve the research problem using a survey questionnaire containing six variables on online learning expertise, eight variables on online learning advantages, nine variables on online learning disadvantages, six variables on skills, and seven variables on modules. The questionnaire contained a five-point Likert scale to represent goals and achieve the best results. The population of this study was 81 participants from two different professional levels in Kurdistan. The teachers and students are appropriate respondents for this study. The survey questionnaire was sent via Viber and Messenger based on Google Forms. After distributing the questionnaires in different scientific settings among the respondents, 81 usable questionnaires were collected. The researcher used Cronbach's alpha to test the reliability of the data as it is one of the important tools used to check the internal consistency of the data. The Cronbach data alpha value was 0.844, indicating excellent data quality. Then, the researchers use descriptive statistics to find the relationship between these variables. The researchers analyzed the data using personal correlation. Furthermore, the researchers used the Chi-square test with SPSS to find the impact of gender and occupation on instructor and student performance towards online and face-to-face classroom learning during the pandemic.

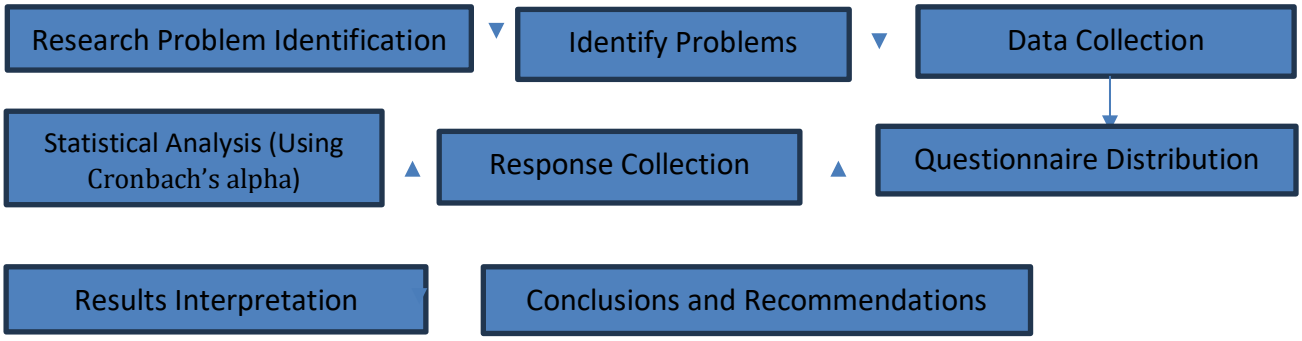

Figure 1. Research Flow Chart

Correlation and Chi-Square

Correlation analysis was used to determine the relationship between independent and dependent variables. The chi-square test is a statistical method that assesses the relationship between the dependent variable and one or more independent variables (Ahmed & Aziz, 2021). The chi-square or chi-squared test is a statistical test used to find the relationship between the observed values and the expected values of raw variables. These values are random, independent, and mutually exclusive of the categorical dataset within a given distribution. It helps the researchers to check the degree to which observed data fits within a population of independent variables (McHugh, 2013).

The Formula for Chi-Square is

$$x_c^2 = \sum \frac{(o_{i-E_i})^2}{E_i} \quad (1)$$

Description:

X^2= Chi-square of independence

O_{ij}= Observed value of two nominal variables

E_{ij} = Expected value of two nominal variables

The study examined students' demographic data, like Gender, Age, Profession, and Department.

Table 1. Descriptive Statistics for Demographic Questionnaire

Demographic Data		F	%
Gender	Male	47	58.0
	Female	34	42.0
Profession	Teacher	50	61.7
	Student	31	38.3
Age	Below 25	30	37.0
	26-35	27	33.3
	36-45	21	25.9
	Above 45	3	3.70

Table 1 shows the descriptive statistics of the respondents in this study, which are categorized into different levels for each demographic level. The questions about gender, department, age, and profession of the participants are presented in terms of frequencies and percentages. By gender, this table shows that most respondents are male (58.0%), while 42.0% are female. Also, it is clear that 61.7% of the respondents are teachers, and a significant percentage of the respondents are students (38.3%). According to Table 1, 37.0% of the participants are under 25 years of age, 33.3% of the participants are between the ages of 26-35 and 36-45, and 25.9% are over 45 years old. Meanwhile, grouping based on majors is presented in Figure 2.

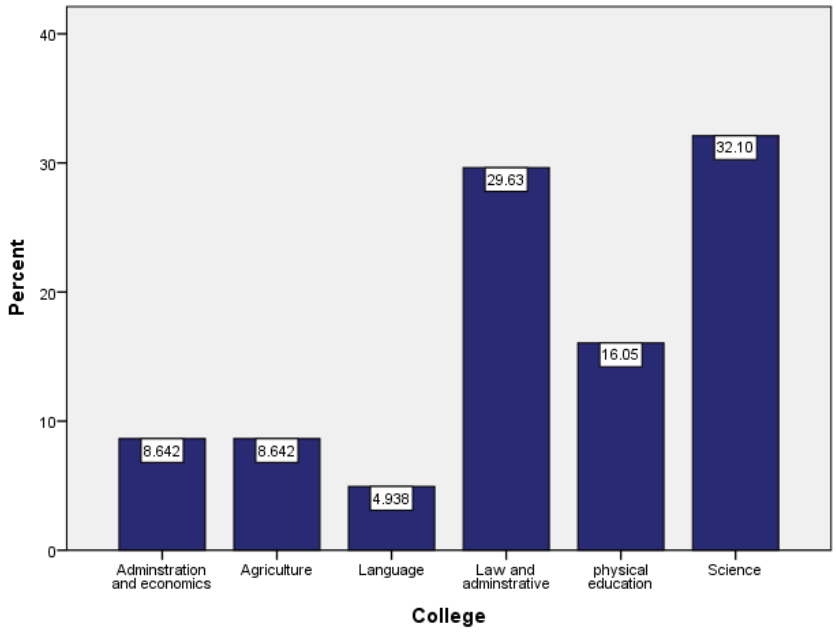

Figure 2. Descriptive Statistics of Students and Teachers at the College Level

Based on Figure 2, the majority of participants were in the Department of Science (32.10%), Administrative, and Law (29.63%), while only (4.938%) were in the Department of Language.

RESULTS AND DISCUSSION

This study attempted to investigate the relationships among online learning experts, online learning advantages, online learning disadvantages, competencies, and modules in Kurdistan. Correlations among the study variables were tested using correlation techniques explained below. To

show our respondents' opinions, we conducted descriptive statistics using six questions about online learning specialists: eight about online learning advantages, nine about online learning disadvantages, six about skills, and seven about modules.

When we asked the Online Learning Experts if they had any ideas about learning before the disease, most participants (30.9%) were normal and agreed with (29.6%). In response to the second question, most participants strongly agreed (38.3%) and agreed (28.4%) that they were not in any online learning classes. (43.2%) believed that online learning had a good effect on students. Based on previous research exploring the design of online teaching activities and online teaching processes. The findings of this study reveal that online classes are one of the easiest platforms for sharing knowledge and gathering needed information. This research also reveals that online learning positively impacts the regularity of teaching and nursing students' learning (Mohammad & Kamran, (2023). In response to the question that they were not familiar with online learning before (27.2%), they were dissatisfied that they were already familiar with using it. Moreover, most respondents (33.3%) said online learning is a small problem.

Concerning the advantages of online learning, 35.8% of the participants agreed that it helped them learn in their environment. In response to the benefits of distance learning, we can continue in our education system throughout the COVID-19 situation (38.3%). Many participants felt it easy and comfortable to listen to lessons and distance learning, accounting for 28.4% and 27.2%, respectively. Furthermore, 25.9% of respondents agree that online learning makes students active and independent. This number indicates that most responses argue that students need to be more active in online learning. Previous research shows that students prefer face-to-face rather than online learning (Kemp & Grieve, 2014).

Furthermore, 29.6% of the respondents believed that they do not need to buy new equipment and books when studying online. Many respondents agree that online learning promotes critical thinking (30.9%). Many participants believed that online learning reduces academic stress, and they feel relaxed and find it easy to work in an online class (42.0% and 48.1%).

Regarding the disadvantages of online learning, teachers and students agreed that they faced problems in online classes with internet connectivity or problems staying in touch with the teacher (34.6% and 34.6%). 44.4% of respondents said that online learning has some health disadvantages. Furthermore, 40.7% and 38.3% of respondents said they do not need help understanding subjects that require real hands-on training. Many respondents agree that students know they receive recorded lectures and do not listen to lectures properly (46.9%). Some students are not used to good behaviour (40.7%), and 48.1% of respondents believe online learning causes social isolation. One of the obvious disadvantages of online learning is to prevent cheating (51.9%). They think it's quite complicated to prevent cheating online by teachers. Furthermore, 40.7% of respondents said another problem is the need for more reliability and quality assurance in online learning. One of the obvious problems is that online learning could be stronger in assessment and practical training (51.9%).

In the skills analysis section, 49.4% of respondents believe online learning needs strong motivation. Students themselves have a role in inspiring knowledge. In response to the second question, there are areas for improvement in developing skill relations in online classes. Most teachers and students in online classes support this view (45.7%). Most respondents agree that online learning should focus on theory rather than practice (39.5%). A total of 42.0% of respondents agreed on the weakness of online learning in terms of student-teacher interaction (such as debate and discussion) and teacher influence. 33.3% of respondents were neutral that time management is more difficult in an online class than in a face-to-face meeting. Furthermore, 38.3% of respondents agree that online learning strengthens critical thinking skills.

In the model's section, 37.0% of students and teachers agreed that IT modules should be taught online for college students. The vast majority of respondents (45.7%) strongly agreed that college students have no problem with science modules Like Mathematics in online classes. In response to the question، modules that require group work and analysis might be better taught (30.9%). On the

contrary, 37.0% of respondents agreed that modules in English are taught preferably online as it increases students' listening skills. Furthermore, 30.9% of respondents agree that theory modules are easier to study and deal with than online classes. In response to the question, models that require practical parts have no value in online classes, and subjects taught online have a higher passing rate than in the classrooms. Lastly, 27.2% of respondents chose neutral answers to both questions.

Research results have been presented. To obtain valid data, a correlation test was conducted between the variables discussed. Table 2 presents the correlation between variables.

Table 2. Correlation Matrix between Variables

Correlations		Online Learning Expert	Online Learning Benefits	Online Learning Disadvantages	Skills	Modules
Online Learning Expert	Pearson Correlation	1	0.590**	0.182	0.316**	0.349**
	Sig. (2-tailed)		0.000	0.105	0.004	0.001
	N	81	81	81	81	81
Online Learning Benefits	Pearson Correlation	0.590**	1	-0.082	0.267*	0.554**
	Sig. (2-tailed)	0.000		0.467	0.016	0.000
	N	81	81	81	81	81
Online Learning Disadvantages	Pearson Correlation	0.182	-0.082	1	0.476**	0.086
	Sig. (2-tailed)	0.105	0.467		0.000	0.443
	N	81	81	81	81	81
Skills	Pearson Correlation	0.316**	0.267*	0.476**	1	0.221*
	Sig. (2-tailed)	0.004	0.016	0.000		0.047
	N	81	81	81	81	81
Modules	Pearson Correlation	0.349**	0.554**	0.086	0.221*	1
	Sig. (2-tailed)	0.001	0.000	0.443	0.047	
	N	81	81	81	81	81

Table 2 explains the correlation between all of the variables. The correlation between online learning experts and online learning benefits is significant because Sig. Value is less than 0.05 (0.000<0.005), the correlation between Online Learning Experts and Online learning disadvantages is not significant because the Sig. The value is more than 0.05 (0.105 >0.05), and the correlation between online learning experts and skills is significant because of Sig. Value is less than 0.05 (0.004<0.05), and the correlation between Online Learning Expert and modules is significant because the Sig. value is less than 0.05(0. 001<0.05). Table 3 presents the chi-square test between gender and online learning.

Table 3. Chi-square Test between Gender and Online learning

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	50.876	43	0.191
Likelihood Ratio	67.423	43	0.010
Linear-by-Linear Association	0.573	1	0.449
N of Valid Cases	81		

As is evident in Table 3, the value of the sig level is greater than the 0.05 alpha (0.268 > 0.05), which means that gender has no significant effect on online or face-to-face learning. Some studies confirm that readiness for online classes was significantly higher among female than male students (Neupane et al., 2020). Table 4 presents the chi-square test between profession and online learning.

Table 4. Chi-square Test between Profession and Online Learning

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	48.291	43	0.268
Likelihood Ratio	64.961	43	0.017
Linear-by-Linear Association	2.784	1	0.095
N of Valid Cases	81		

As is evident in Table 4, the value of the sig level is greater than the 0.05 alpha (0.191 > 0.05), which means that the profession has no significant effect on the Instructors' and Student's performance toward online learning and Face-to-Face class during COVID-19 pandemic. Based on the explanation above, online learning can positively and negatively affect students. This research proposes the need for strong quality assurance mechanisms in online education to prevent academic fraud and increase trust. Greater investment in reliable internet infrastructure and accessible digital tools is essential to ensure equitable participation.

LIMITATIONS

This study has limitations beyond the researchers' control, such as the restricted scope of data collection through questionnaires without in-depth exploration, the limited number of participants (81) from Kurdistan, which may not be globally representative, and budget and research tools constraints. Future studies should employ more diverse data collection methods and include a broader population to achieve more comprehensive results.

CONCLUSION

This paper discusses online learning experts, advantages and disadvantages, skills, and modules for online learning during the closure of colleges and universities due to the COVID-19 pandemic. The study examined the views of colleges of business and economics, science, law and administration, agriculture, languages, social sciences, and physical education. It concluded that most participants did not participate in online learning before the pandemic. As the majority agreed that this helps with unpaid distance learning to universities and transportation costs with minimal use time, access to learning skills, especially theoretical modules taught in English, is an important skill to encourage lifelong learning and professionalization in their fields. According to the disadvantages, teachers and students viewed the inefficiencies in teaching certain skills, such as practical skills, that require group work. Also, teachers and students agreed on the weaknesses of online learning regarding student-teacher interaction (such as debate and discussion). Another disadvantage of online learning is that preventing teachers from cheating online is complicated, affirming the need for more trust and quality assurance. However, this research is only limited to collecting data through a questionnaire. For further research, data is expected to be collected through interviews so that the information obtained can be further developed and bring up new information.

AUTHOR CONTRIBUTIONS

KGA conceptualized, validated, and prepared the original draft of this research. BMF reviewed the methodology and writing and conducted data analysis. KJR developed the questionnaire, distributed the survey, and composed the discussion section. All authors have read and approved the published version of the manuscript.

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