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Satisfaction and Challenges of Design Studies Via Virtual Classes

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رضا وتحديات دراسة التصميم عبر الفصول الافتراضية

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Abstract: **Purpose -** In response to COVID-19, many universities around the world have stopped in-class education and moved to online learning and technology via virtual classes. The aim of this study is to investigate whether students are satisfied with Design Studies strategies, such as design thinking, problem solving, and group work, to find out if, from the student's perspective, they can be achieved through online education. It also considers the challenges of online education in the Interior Design discipline.

Design\Methodology\Approach- Data were collected using both qualitative and quantitative methodologies. A total of 206 students participated in the questionnaire survey, and 40 students participated in in-depth interviews. The questionnaire considered three areas: satisfaction levels and challenges in terms of applying suitable design study methods during class, such as creative thinking, problem solving and group work; and the efficiency of the Blackboard program used.

Findings- The findings strongly revealed that students were dissatisfied with virtual classes in practical design studios, as they could not achieve cognitive thinking, problem solving or group work effectively. In contrast, the majority of students were satisfied with virtual classes for theoretical courses. We also found significant differences in the results between students in different study years; senior students did not face as many challenges as freshmen students.

Originality/Value- This paper generates findings that need to be taken into consideration by the Ministry of Education. Research recommendations should be considered for future rules given by the Ministry of Education or universities.

الملخص: نظرًا للأوضاع بعد جائحة كورونا-19، أوقفت العديد من الجامعات حول العالم التعليم في الفصول الدراسية وانتقلت إلى التعليم عن بعد عبر الفصول الافتراضية. ولذلك؛ فإن الهدف من هذه الدراسة هو التحقق من مدى رضا الطلاب عما إذا كانت إستراتيجيات تعليم التصميم، مثل التفكير التصميمي وحل المشاكل والعمل الجماعي، يمكن تحقيقها من خلال التعليم عن بعد من منظور الطلاب في المقررات الدراسية، والنظر في تحديات التعليم عبر الإنترنت في تخصص التصميم الداخلي.

تم جمع البيانات باستخدام كل من المنهج النوعي والكمي. وشارك 206 من الطالبات في استطلاع الرأي، وتم عقد لقاءات مع 40 طالبة. وعملت دراسة البحث في ثلاثة مجالات: مستويات الرضا والتحديات، وتطبيق أساليب دراسة التصميم المناسبة أثناء المحاضرة، مثل التفكير الإبداعي وحل المشكلات والعمل الجماعي، ومدى كفاءة برنامج البلاك بورد المستخدم. وقد أظهرت نتائج الاستبانة أن الطالبات غير راضيات عن الفصول الافتراضية في استوديوهات التصميم العملي، حيث لم يتمكنّ من تحقيق التفكير الإبداعي أو حل المشكلات أو العمل الجماعي بشكل فعال.

كما أظهرت نتائج اللقاءات أن غالبية الطالبات راضيات عن الفصول الافتراضية للمحاضرات النظرية. ووجد البحث أيضًا فروقًا ذات دلالة إحصائية في النتائج بين الطالبات في سنوات الدراسة المختلفة بحيث إن الطالبات من المستويات الدراسية العليا لم يواجهن صعوبة في استيعاب المنهج بقدر الطالبات في المستويات الأولى في التخصص.

في الخاتمة؛ استنتجت هذه الدراسة نتائج يجب أن تؤخذ في الاعتبار من قِبل وزارة التعليم والجامعات. فالتوصيات المقدمة في هذا البحث ينبغي النظر فيها للأنظمة المستقبلية التي تقدمها وزارة التعليم أو الجامعات.

Introduction

The classroom is a common space for education in different education levels around the world. There were special schools or universities that applied distance education using a variety of means, but this was not common. However, after the COVID-19 pandemic, education as a domain experienced some major changes in its pedagogical methods. One of these changes is the shift from real classrooms to virtual classes. The virtual class has many advantages as well as disadvantages; in order to find what there are, the study needed to investigate this from the students' perspective. The literature review will discuss COVID-19 and online education. It will also explore online learning within different areas of study.

COVID-19 and Online Education

COVID-19 is a global health emergency that was declared to be an international pandemic by the World Health Organization (WHO) on 11th March 2020 (Cucinotta & Vanelli, 2020). From this date, the prevalence of the pandemic accelerated rapidly around the world. As a consequence, many universities

around the world closed their campuses and implemented online classes (Quintana, 2020; WAMU, 2020; Zubașcu, 2020). The pandemic has had a major impact on university members such as students, faculty, and staff as they could not go to schools (Almanthari et al., 2020). As a result, many universities have focused their efforts on providing online distance education (Tang, et al., 2020). Whilst it is important to note that online education is a very common and well-known educational approach, according to Romero-Rodríguez et al. (2020), there have been challenges to swtiching conventional educational approaches around the world to online education. Universities and students have faced many obstacles (Crawford, et al., 2020). Most universities have used the technical resources they possess to provide either online virtual classes or recorded lectures, as it is not clear when this pandemic will end. At the same time, teachers have started to develop their knowledge about using online educational systems to replace face-to-face classes (Kaur, 2020). However, it is important to consider hands-on and non-theoretical students, who might not be able to study through virtual classes. Another issue is that student socialization is missing from online education, and this is an important part of conventional classes. As a result, students are missing out on sharing ideas and on discussion (Britt, 2006).

Online Learning from Different Studies

Many recent studies have discussed distance education as a result of COVID-19 in their countries, for example China (Feng, et al., 2020), India (Khattar, et al., 2020), Pakistan (Adnan & Anwar, 2020), Turkey (Caliskan, et al., 2017), and Hungary (Géczy et al., 2020). Also, it has been found that Arab countries have generally accepted the idea of distance education (Al Lily, et al., 2020). In Pakistan, a study discussed students' attitudes toward distance learning at university. The perspectives of both undergraduates and postgraduates were analyzed. The study found that online distance learning is not satisfactory because a large number of students were not able to access the internet due to technical and financial issues. In addition, the absence of face-to-face interaction between instructors and students and among students themselves was an issue which was identified by students (Adnan & Anwar, 2020). Similarly, the technical issues related to delivering online learning were investigated in China. Feng et al. (2020) investigated the challenges of online studies from the perspectives of students and teachers. The authors found that delivering online education is not simple and that universities need to consider the issue in terms of technological difficulties and content.

In India, Khattar, et al. (2020) conducted a survey with 516 students to investigate their perspectives on five areas in relation to online study. The areas they considered were: Online learning experience, digital connection, engagements, social life, emotions, and mood. The study found that the majority of participants claimed that online education can be subliminal to real class education, but that it cannot take the place of a face-to-face class environment. On the other hand, in Turkey, Caliskan et al. (2017) investigated students' satisfaction with distance education in different disciplines, such as special education, medicine, the Turkish language and computer science. The survey included 107 students. It found that the majority of students were satisfied with distance education. Similarly, Alsamri et al. (2020) state that postgraduate students in Cairo University were satisfied with distance education for many

reasons; it allows students to attend all their classes on time without the effort of leaving home or work in order to go to the university; students also had more self-confidence about discussing their projects online as some had found it hard to talk in-person in front of a large number of people when presenting their work prior to online classes; students were relaxed at home, and thus, felt able to study for their exams with little effort in comparison to studying in and spending long periods at the university.

Bardisi (2017) did a survey for 4,820 distance education students in King Abdul Aziz University in Jeddah and found that demographical factors play a major part in students' satisfaction with distance education; specifically, students who were above 31 years old, lived outside the city, worked and were married prefer distance education. It is important to highlight that these students were not studying a major that included medicine, labs, or design studios; they were studying theoretical courses. Another study was conducted in the same context and at the same university, during the COVID-19 pandemic when all education was being delivered online (Yousif, 2020). The author handed out a questionnaire to 151 students at the College of Communication and Media. The study found that 73% of the students were satisfied with distance education, and their grades were not adversely affected. Additionally, 59% of the students claimed that their grades improved during distance education. Student attendance was at 97%, which indicates that the students cared about attendance (Yousif, 2020).

Abualhaj (2019) investigated student satisfaction with the Blackboard program for distance learning, for an Islamic course. He found that most students were satisfied with Blackboard for this course because it uses a discussion board that allows students to have additional discussions with the tutors. It also includes office hours online, meaning there is no need to go to the university and make an appointment to meet a tutor. Additionally, it helps students to improve their grades as they can find their grades online in a timely manner, and they are more committed to submission times. Virtual classes via Blackboard were also investigated by Ali (2020), who studied students' opinions of virtual classes for a lighting design course at the Interior Design Department of the University of Taibah. She found that 77% of students support the idea of virtual classes for the theoretical part of the course, but they would prefer the mix between in-person class attendance and virtual classes for the practical part of the course. However, it is important to highlight that student grades remained similar whether they attended real or online classes.

However, recent research studies have discussed the challenges related to distance learning during COVID-19, as discussed above. In order to discuss the challenges of online education Almanthari et al. (2020) state that students' opinions should be explored. Studies should investigate factors that stop students from achieving their goals in online classes. Also, the quality of online teaching should be discussed in future studies (Basilaia & Kvavadze, 2020).

Some recent studies have discussed distance education for specific courses or specific disciplines. For instance, for Medicine, one study compared online and offline student outcomes, as presented in 3,700 papers published from 2000-2017. It concluded that there is no significant evidence that offline learning systems work better. It also stated that online learning does have advantages in terms of enhancing the knowledge and skills of Medicine undergraduates. As a result, the authors concluded that learning online

should be considered as a potential way to teach undergraduate Medicine students (Pei & Wu, 2019). Moreover, in some disciplines, such as architecture, there is no place for insufficiency in teaching the courses, as it could lead to the graduation of poorly qualified architects (Selim, 2021). There is little study focus on virtual classes for design studios; only in the discipline of Interior Design after the Covid-19, such as that of Alawad (2021), who investigated five categories from the students' perspectives on virtual classes. These categories are: Curriculum, Illustration, Students' experience, Interaction with the teacher, and Overall satisfaction & hope. Therefore, the aim of this study is to fill the gap in knowledge by investigating students' satisfaction and the challenges they have faced during distance learning via virtual classes of theoretical and practical courses at the University of Jeddah in the discipline Interior Design. It aims to ascertain if, from the perspective of the students, Design Studies strategies, such as design thinking, critical thinking, problem solving, and group design studios and computer laboratories can be achieved through virtual classes.

Research Design
2.1 The aims of this study are:

> To investigate undergraduate students' satisfaction with online virtual classes in Interior Design courses which are theoretical, computer laboratory, and practical design studio courses via Blackboard at the University of Jeddah.

> To discuss the challenges faced by undergraduate students taking online virtual classes in Interior Design courses which are theoretical, computer laboratory, and practical design studio courses via Blackboard at the University of Jeddah.

> To explore the effectiveness of Blackboard programs in online virtual classes in Interior Design courses which are theoretical and practical design studio courses.

> To establish if Design Studies' strategies, such as design thinking, critical thinking, problem solving, and group work can, from the perspective of the students, be achieved through online education.

In order to achieve this aim, the following questions will be considered:

> Is there a difference between students' satisfaction levels and the challenges they face for theoretical and practical courses delivered via virtual classes?

> Is there a significant difference between the satisfaction levels or challenges faced by university students for courses delivered through distance education according to the year of study?

> What is the perspective of students on the development of Design Studies' strategies such as critical design thinking?

Methodology

> A mixed methods approach was used, and both qualitative and quantitative data were gathered through a survey questionnaire and interviews. An online survey technique was employed to gather data.

Based on previous studies, as shown in Table 1, the survey questions included 46 questions in three categories: satisfactions, challenges of applying design studying method during class, such as creative thinking and problem solving, group work. The questionnaire was made available for students online, and interviews were conducted via Blackboard with 40 students after they had filled in the questionnaire. Interviews were open ended to allow students to express their satisfaction level and challenges without any barriers.

Table 1: Areas used to investigate the factors that affect online learning in previous studies (source: author, 2021)

REFERENCE	ONLINE STUDY AREAS EXAMINED
CALISKAN ET AL, (2017) BARDISI (2017) ALSAMRI ET AL, (2020) YOUSIF (2020)	Student satisfaction with distance education
LIMAREV ET AL, (2020)	Financial issues Study environment Training in programs Self-organization Ability to get feedback from teachers Communication skills during class Difficulties in learning disciplines that require practical skills
FENG ET AL, (2020)	Challenges
KHATTAR ET AL, (2020)	Online learning experience Digital connection Engagements Social life Emotions and mood
ALAWAD (2021)	Curriculum Illustration Students' experience Interaction with teacher Overall satisfaction & hope

Design Studies Strategies

Recent studies claim that design thinking is essential in education (Christensen, et al., 2016; Smith, et al., 2015). This is in agreement with El Samanoudy and Abdelaziz (2020), who state that creative design thinking strategies should be essential in interior design education, instead of traditional teaching methods involving reading and memorizing. Design thinking helps students to understand the choices made at different stages of design. It also helps in reflecting the idea to judgments, as it shows how designers handle complex problem (Christensen, et al., 2019).

A studio system is a major part of Design Studies, such as Interior Design and Architecture (Géczy, et al., 2020). In Design Studies, students should be able to develop many design skills, including critical thinking and problem solving. The concept of critical thinking and problem solving is considered mandatory in Design Studies (Toker & Baturay, 2021). Creative critical thinking helps students analyze, discuss and evaluate information in order to solve problems in Design and make decisions (Haynes & Bailey, 2003). This is in agreement with Sosu (2013), who states that design studio activities are connected with the cognitive dimension of creative critical thinking, which supports the development of skills among students (Mofield & Parker Peters, 2019). Additionally, critical thinking is associated with problem solving (Kirmizi, et al., 2015). In Design, problems are always solved as a result of creative thinking and

motivation. For instance, a study by Balakrishnan (2021) investigated the impact of implementing design thinking in increasing the creativity and motivation of undergraduate Design students. The author interviewed a group of students and found that design thinking had a positive impact on students as it helps them to become creative and motivated. It also develops students' practical, innovative designs, highlighting the importance of utilizing design thinking in Design Studies in order mould the future creative designer. Moreover, it has been argued that problem-solving processes in Interior Design courses should be enjoyable to make the interior designer active in team work (Piotrowski, 2011). In order to achieve design thinking, critical thinking, motivation and problem solving, body language is required. Sinnamon and Miller (2021) argue that body movement is mandatory in architecture design courses, having interviewed 39 students at Queensland University of Technology, Brisbane, Australia. The author found that from body movements there was a positive impact on students' motivation during the design studio classes.

In addition to considering the design studio, some studies have discussed computational thinking, which has become a major method for helping to explain design concepts and ideas in the process of design. It is referred to as the parametric design method (Alalouch, 2018). Computational thinking also helps people to process tasks in different disciplines efficiently (Lu & Fletcher, 2009). Gerber, et al. (2015) argue that having computer skills in your discipline is more important than having knowledge in computer science. The advances in computer programs now mean that computer courses are essential in design studies.

Sample

The sample for the study included 206 undergraduate female students in the Interior Design Department at the University of Jeddah who are currently studying online. It is important to highlight that the total number of students at the department is 276, which means that a sample size of 206 provides a 99% confidence level for the findings. Students' ages ranged from 19-21. Students were at different stages on their courses. The sample included freshmen, sophomores, juniors, and senior students. The questionnaire questions investigated student' satisfaction and challenges for theoretical, practical courses (design studios, computer programs' course). To maintain validity and context, the students who participated in the interviews had different GPAs; there were 10 students with excellent GPAs, 10 with very good GPAs, 10 with good GPAs, and 10 with below good GPAs to avoid bias. Interviews were done online, from February to May 2021, as the students finished a full year with distance education. During the interviews, students had the chance to express and mention any comment or recommendation from their point of view. The interviews took place after the questionnaire, as questionnaire questions gave them enough time to think about what to discuss. At the end of the questionnaire, they were asked whether they wanted to participate.

Data Analysis

The data obtained through an online survey were analyzed via SPSS to find the frequency of common student responses and ascertain percentages. Additionally, mean and standard deviations of the

gathered data were used. Significant differences between means and student study years were also explored.

Results and Discussion

The results of this study can be divided into two categories: satisfaction level and challenges, which are described in detail in the following sections.

Satisfaction

The mean and standard deviations for the students with regard to satisfaction are shown in Table 2. According to Table 2, means which equal 3 or higher are acceptable. The results show that students' satisfaction with distance education via virtual classes for theoretical courses had the highest mean (mean = 4.15). The next highest mean was for students' satisfaction with a professor's assistance during the lecture time in the virtual class when they had a question about design (mean = 3.44). Then, students' satisfaction with the ease of communication with the professor during the lecture in the virtual classroom (mean = 3.21). The lowest means were for students' satisfaction with distance education for the practical design studio (mean = 2.7) and with the ease of communication and interaction with their colleagues during the lecture in the virtual class (mean = 2.75). The results show that they are not satisfied with their achievements during distance classes for practical courses (mean = 2.88).

In addition to the questionnaire's statistical findings, the interviews with 40 students also indicated that students are highly satisfied with education via virtual classes for theoretical courses. According to Alawad (2021), the newer students expressed more satisfaction with design studios via virtual classes in design studio than senior students. In contrast, in this study newer students are highly dissatisfied with virtual classes for the practical design studio work and their achievements during distance education, except for some students in senior studios, as shown in Fig.1. This could be because students at this level have started to be independent and have all the skills they require. They mentioned that they do not need the tutor's advice in all classes. However, all 40 interview participants expressed dissatisfaction with the communication and interaction with colleagues during virtual classes. For communication with the tutor during the lecture and for the tutor's assistance during the lecture time, Alawad (2021) found students of studios 2 and 4 were more satisfied than were the students of studio 6. In this study, most students mentioned in the interviews that their satisfaction depends on the tutor's skills. Students went on to assert that some tutors have high skills with Blackboard, so they can assist students quickly and clearly. They also mentioned that some tutors use the most up-to-date skills that help in delivering the information clearly to students, through virtual classes.

most up-to-date skills that help in delivering the information clearly to students through virtual classes.

Table 2. The mean and standard deviations for the number of students in the satisfaction categories.

STUDENT SATISFACTION WITH DISTANCE EDUCATION IN DIFFERENT AREAS	MEAN	STD. DEVIATION	ST. ERROR	NUMBER OF RESPONDENTS

PRACTICAL DESIGN STUDIO COURSES	2.28	1.05	0.186	206
COMPUTER PROGRAM COURSES	3.1	1.3	0.13	206
THEORETICAL COURSES	4.41	0.99	0.09	206
ACHIEVEMENTS IN DESIGN PROJECTS	2.88	1.21	0.11	206
COMMUNICATION AND INTERACTION WITH COLLEAGUES DURING THE LECTURE	2.75	1.37	0.13	206
COMMUNICATION WITH THE TUTOR DURING THE LECTURE	3.21	1.27	0.12	206
TUTOR'S ASSISTANCE DURING THE LECTURE TIME	3.44	1.13	0.11	206

Students' satisfaction with Blackboard was also investigated, since Blackboard is the program used for virtual classes at the University of Jeddah. In agreement with Alawad (2021), who states that students have no obstacle using Blackboard, in this study, Table 3 indicates that students are satisfied with Blackboard for theoretical courses (mean = 4.28), computer program courses (mean = 3.12), and the practical design studio (mean = 3.00). Students discussed, during interviews, that the program has many advantages. It also has many of the tools required for all courses, but it requires more effort and time. They went on to express that during the design studio, students want to sit together in a group and make free-hand additions to each other's drawings, but this is not possible through Blackboard. The participants claimed that during virtual classes they need the tutor to see and use their AutoCAD or 3D max files, if they have any issues. In order to do this, they have to send the file to the tutor via email, then the tutor downloads it and opens it. After that, she can share the screen and show the student how to fix the issue she is struggling with. On the other hand, in a real computer laboratory, the tutor can go the student's desk and use the mouse to fix the issue immediately, which takes half the time that is spent via a virtual class. It is important to highlight that three to four students every hour need this kind of help from the tutor. Due to these challenges, some freshmen stated that they had thought of quitting the university for the semester, as they would prefer to return when real classes are once again available. They mentioned that the number of challenges they struggle with means that they do not enjoy the classes, and as a result, they do not do their best for home work. One of the A* freshman students dropped out for the semester to ensure she did not get lower marks, as she found it exceedingly difficult to study Interior Design via virtual classes.

Table 3. The mean and standard deviations for the number of students in the category of satisfactions with the Blackboard program

STUDENT SATISFACTION WITH THE BLACKBOARD PROGRAM FOR DIFFERENT COURSES	MEAN	STD. DEVIATION	ST. ERROR	NUMBER OF RESPONDENT
PRACTICAL DESIGN STUDIO COURSES	3.00	1.34	0.13	206
COMPUTER PROGRAM COURSES	3.12	1.31	0.12	206
THEORETICAL COURSES	4.28	0.94	0.09	206

Challenges

According to Table 4, the highest challenges for students are in technical issues (mean = 4.33). Then, challenges due to absence of body language (mean = 3.79), group work (mean = 3.73), problem solving (mean = 3.45) and critical thinking (mean = 3.29). Additionally, in order to assure the validity of answers concerning satisfaction in Table 2, students were asked about challenges on the same points.

Results show that theoretical courses have a low mean in challenges (mean =1.75), but there is significant difference regarding student challenges of distance learning in theoretical courses in different years of study (p = 0.027). First year students had higher mean challenge (mean = 2.18) than students in the rest of the years. Also, there is significant difference in the means regarding negotiating design ideas and discussing them, and thinking about drawing with students in different years (p = 0.012). Third-year students have a high mean for challenges in this point (m = 3.03), while the rest of years were around (mean = 2.06). The conclusion from this is that there is a greater challenge in teaching design studios via virtual classes, as shown in Fig. 1, than there is for a computer laboratory, and theoretical courses pose the smallest challenge.

Table 4. The mean and standard deviation of the number of students in the category of challenges

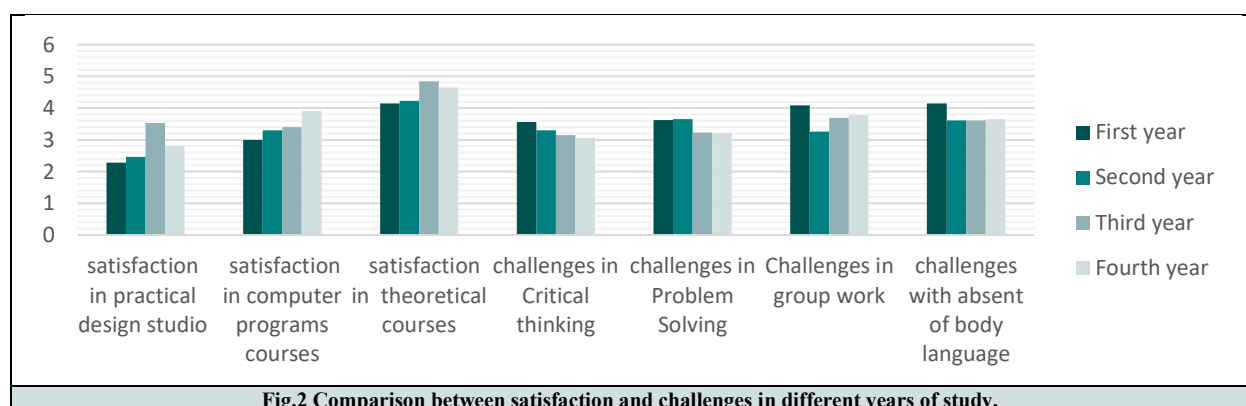| STUDENT CHALLENGES WITH DISTANCE EDUCATION IN DIFFERENT AREAS	MEAN	STD. DEVIATION	ST. ERROR	NUMBER OF RESPONDENT
DESIGN STUDIO	3.0	1.2	0.12	206
COMPUTER PROGRAMS	3.11	1.31	0.12	206
THEORETICAL COURSES	1.75	1.18	0.11	206
NEGOTIATING DESIGN IDEAS AND DISCUSSING THEM WITH THE THINKING DRAWING	2.47	1.17	0.11	206
DISCUSSING SPATIAL ANALYSIS AND DISCUSSING IT WITH DRAWING WITH THE TUTOR	2.56	1.22	0.12	206
CRITICAL THINKING	3.29	1.36	0.13	206
PROBLEM SOLVING	3.45	1.34	0.13	206
GROUP WORK	3.73	1.52	0.15	206
ABSENCE OF BODY LANGUAGE	3.79	1.42	0.15	206
TECHNICAL ISSUES	4.33	1.02	0.10	206
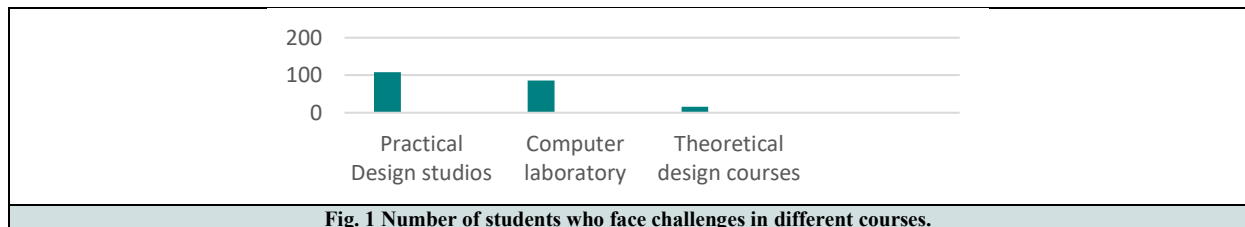
Fig. 1 Number of students who face challenges in different courses.

El Samanoudy and Abdelaziz (2020) state that students need close supervision for design processes in class. The interviews with students clarified that studying via the Blackboard program is difficult in courses that require drawing and discussions about hand drawings every hour or 30 minutes with the tutor. They also claimed that they cannot discuss group work during virtual classes and that they have to meet in a café or at home, later, to achieve their tasks for group work. This increases the effort required to complete a task. Additionally, since the students and tutors are Saudi females, they do not turn on their cameras. This means there is an absence of body language and facial reactions, which is an obstacle. Students claim that, in virtual classes, the six hours for design studios are not enough for each student to discuss her project with the tutor, while this time was more than enough in a real class. The majority of interviewed students asserted that design studio and computer programs need to be in a real studio not virtual classes, especially in the first two months of the semester. They stated that cognitive thinking, group work and problem

solving require free-hand drawing, sketches, and editing on hard copy plans. These skills cannot be achieved while each student is at home. They all need to be in one room. This indicates that there is a significant agreement from all students of all study years on the necessity of the teacher's presence in the classroom face-to-face in practical subjects, especially drawing and design studios, which is an urgent necessity that cannot be replaced by virtual classrooms in the field of Interior Design, unlike theoretical subjects.

The study also investigates if there is a comparison between satisfaction and challenges in different years of study, as shown in Fig.1. Fig.1 indicates that students in their third year of their study had higher mean scores in terms of satisfaction except for the computer program courses, where seniors had the highest means. This could indicate that in more advanced years, students become more expert with computer programs, which could make it easier for them to study it in virtual classes. On the other hand, first- and second-year students expressed high challenges in relation to practical design studios and in terms of performing critical thinking, problem solving, group work and as a result of an absence of body language. Additionally, SPSS analysis shows significant differences between study years and students' satisfaction or the challenges they faced. For instance, there is a significant difference in student satisfaction with distance learning for design studios in different years (p = 0.001).

It can also be noticed from the interview data that some students have difficulties in understanding; these students expressed more challenges with distance education. Students also noticed that home is not an education environment, as some families have five to eight family members. They talk, cook, vacuum, sleep, and perform home activities which create noise and stop students from being able to focus on their classes. In addition, married students expressed more difficulty in terms of distance education, as they have their children at home, who must be taken care of; additionally, some had to fulfill home duties, even cooking lunch during the class. As a result, they strongly agreed that real classes in Interior Design courses need to take place at the university, except for theoretical classes.

Fig.2 Comparison between satisfaction and challenges in different years of study.

The target of this research is to investigate students' satisfaction and challenges with distance education via virtual classes in the discipline of Interior Design in relation to three types of courses: theoretical, practical design studio and practical computer laboratory. Ali (2020) investigated students' opinions of virtual classes for one course only, that contained a theoretical and practical part. She argues that students support the idea of virtual classes for theoretical courses. However, she asserts that they prefer

the mix between real class attendance and virtual classes for practical courses. In this study, students' opinions were investigated for all design courses of four years of study. The findings for this study revealed that there are significant differences between students' opinions in different years. It was found that freshmen identified more challenges with distance education compared to juniors and seniors, who expressed more satisfaction. However, critical thinking and problem solving are considered mandatory in Design Studies (Toker & Baturay, 2021), and participants in this study agreed that practical design studio skills such as critical thinking and problem solving through sketching and group discussion are not easily achieved via virtual classes. They strongly argued that these types of courses require real attendance at the studio or their creative design skills will not be developed effectively.

Some studies state that practical laboratories for engineering courses can be delivered effectively via remote learning (Costa, et al., 2020; Poliakov & Rida). As computer programs are essential in engineering courses, remote education can be fast in this field (Fernandez, et al., 2020; Gleich, et al., 2020). In this study, students, especially freshmen and sophomores, claimed that practical computer design laboratory skills cannot be learned via virtual classes, as they need to show their files to the tutor while working on them. The tutors need to check students' files and mark issues that prevent students from completing the task successfully. Therefore, in the first two years of study, real practical computer design laboratories are preferred rather than virtual classes. The study findings could be summarized in the following points:

There is a significant agreement from all students of all study years on the necessity of the teacher's presence in the classroom face-to-face in practical subjects, especially drawing and design studios, which is an urgent necessity that cannot be replaced by virtual classrooms in the field of Interior Design, unlike theoretical subjects.

Design studios are more of a challenge to be taught via virtual classes, as shown in Fig. 1; then computer laboratory; and theoretical courses are least challenging of all.

Newer students are highly dissatisfied with virtual classes for the practical design studio.

Students' satisfaction with Blackboard depends on the tutor's skills.

Conclusion

The study investigated students' satisfaction and challenges with online virtual classes in Interior Design courses for theoretical, computer laboratory and practical design studio courses via Blackboard. The study is limited to one department in one university, which is the Interior Design Department at University of Jeddah. Conducting this study took some effort in finding time to meet online students, as they were very busy studying at home most of the day. Also, Wi-Fi connection at some students' homes was an obstacle that required that some interviews had to be repeated at a different time.

The findings strongly revealed that theoretical courses can be learned via virtual classes. The results show that theoretical courses have low mean scores for challenges (mean = 1.75), but there are significant differences regarding student challenges with distance learning for theoretical courses between different years of study ($p = 0.027$). First-year students had a high mean score for challenges compared

with students in other years (mean = 2.18). On the other hand, the majority of freshmen, sophomores and junior students claimed that design studio sessions should take place at the university. Students strongly argued that design skills, such as creative thinking and problem solving are extremely hard to develop via distance education. They prefer real attendance at university. Also, there are significant differences in the means relating to negotiating design ideas and discussing them and thinking about drawing of students in different years (p = 0.012). Freshman and sophomore students find it more difficult to complete design studio tasks at home in comparison to senior students, who are more expert and independent.

For computer courses, students claimed that a tutor's skills in teaching via virtual classes have the greatest effect on whether students understand the program tools. They also mentioned that twice the time should be allocated for studying such courses via Blackboard, as following the tutor takes a lot of class time in online settings. Finally, the interviewed students expressed the view that home is not an educational environment and that studying at home is difficult in terms of education, as they are also having to struggle with home duties, and this is especially that case for married students. Further studies are needed to investigate tutors' satisfaction and challenges regarding distance education.

Recommendation

Class recording should be mandatory, as it is an easy and quick reference for students if they need to go back to any information that was discussed during class.

Class recording is important, as it saves student rights for any information that can affect their grades later.

Virtual meeting can be used for office hours if students cannot go to the university to meet the teacher.

Design studio programs need to be taken at the university, and theoretical classes can be taken via virtual classes, which means mix methods are recommended.

Computer laboratories need to be taught in a real lab for freshmen and sophomores.

More research is recommended to investigate tutors' satisfaction and challenges regarding distance education.

Limitation

The sample size in the quantitative part of the study was the major limitation of this research, but it is important to highlight that the total number of Interior Design undergraduate students at the university of Jeddah is only 267. A non-random sample of participants meant it was possible to select students with different GPAs, and from different years of study, for the interviews. The results of the study are limited to students' opinions; however, it is also important to find out tutors' opinions about distance education via virtual classes in Design disciplines.

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