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Educational behavior of the students in the design studios during the pandemic time

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Abstract

The main aim of this paper is to demonstrate the process of adapting architecture students to the pandemic condition in the design studios due to wearing face masks and social distance measures. An architectural design studio is different from a normal classroom due to the open space for open discussion and dialogue and group work. The methodology of the research was designed based on the quantitative method with the application of the Likert scale questionnaire and analyzing the data in SPSS. The findings of the research identified that three factors are important for the students in the activities in the design studios including desk-crits (critique), social interaction, and the physical environment of the design studios. The Chi-square analysis illustrated that the students preferred to use the individual desk-crits over group desk-crits during the pandemic time due to wearing face masks and social distance. Apparently, public activities such as presentations, communication, and discussion were replaced with the individual desk-crits as a more adapted form to wearing face masks and social distance for the students in terms of personalization of the learning process in design studios during the pandemic time.

1. Introduction

During COVID-19, all educational centers somehow have faced challenges to run normal educational activities such as teaching, learning, and assessments. The report mentioned that the pandemic involved more than 180 counties in the world with compulsory measures for the safety of people in educational centers (Marinoni et al., 2020). Some of the measures changed the behavioral patterns in the schools, colleges, and universities importantly wearing face masks and social distance. Despite the guidelines to handle teaching and learning during the pandemic time, seemingly, both lecturers and students faced uncertainty in the way of teaching and learning, accessibility to online platforms, communication, and interaction as part of the education process (Naylor and Nyanjom, 2020).

The government of Rwanda also designed a serious protocol to control the spread of COVID-19, particularly in public areas such as schools and universities. Therefore, it was supposed that all participants applied face masks and social distance in the educational centers while they used sanitizer and washing hands as supportive measures. The department of architecture at the University of Rwanda also prepared to adopt new teaching styles in the department in terms of blended learning while the design studios were reminded on-campus as practical activities. The students changed the seating positions based on the social distance in the design studios to respect the measures. This also affected the peer and group activities of the students in the whole process of adaptation to the pandemic conditions.

Despite the physical attendance in design studios, the students did not follow the normal behavioral patterns such as sitting together for the design activities due to the fear of the pandemic and also inspectors who checked the activities of the students in the classrooms and studios. Although instructors had the right to reduce the number of students based on the shifting plan to 30 per cent in each session, the students participated fully in classes due to their need for desk-crits (desk critiques) and comments of instructors for the development of the architectural

** All responsibility belongs to the researcher. All parties were involved in the research of his own free will.*

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project. Therefore, a lot of variety of behavioral activities took place in the design studios to keep active the interaction due to different tasks such as drawing, design, physical model making, and presentations.

Design studios in architecture programs are constructed based on social interactions between all participants such as students, instructors, juries, and visitors. It has a long history in terms of open design studios for art, architecture, and design in French education culture (Dizdar, 2015; Draper, 1977; Drexler, 1975; Tafahomi, 2021a). A design studio is a place where the students learn how to draw and design an architectural project under the supervision of the studio leader who is called the coordinator or instructor of the design studio (Tafahomi, 2022). The education and training of the students are constructed based on the social interaction between the students and instructors in daily activities including three times per week, ten hours, as the official time of studios and other times as some theoretical courses that the students should pass with other lecturers (DoA, 2012; FAED, 2009). Therefore, a design studio is a continuous process of communication and interaction between students and instructors based on the physical conditions and facilities. There is a wide range of design studios based on the structure of buildings, size, and time of construction. However, the central part of the design studios is designed based on a big hall for portable drawing tables, chairs, and shelves for archiving the physical models and drawing boards. Some design studios include fixed tables and partitions for the students in raw and jointed tables (Tafahomi, 2021b).

However, this interaction should take place through dialogues and communication that wearing face masks and social distance distrusted the students from the normal process in design studios. In fact, social interaction happens through close distance and sitting together for talking, drawing, and critique (Schon, 1984; 1987). Seemingly, wearing face masks reduced the quality of voice and discussion (O'Hagan et al., 2022) in design studios. The study remarked that wearing face masks also had negative effects on the level of oxygen in the blood of users (Mckeever, 2022) affecting the level of sharpness and tiredness of both students and instructors.

COVID-19 creates an unexpected situation for teaching not only in the department but also in the world. Both students and staff attempted to fit themselves with the measures and requirements. However, it was common to hear dissatisfaction from both lecturers and students about the educational situation due to unusual conditions in design studios and the risks of the pandemic. Certainly, it was clear that the pandemic affected the teaching and learning in the department which needs to be evaluated through research. Therefore, questions come to mind what effects did COVID-19 have on the social interaction and behavioral patterns of the students? Then due to these effects did the students satisfy with the quality of the design studios during the pandemic time? To find out the possible effects of wearing face masks and social distance on the quality of design studio activities a questionnaire based on the Likert scale was designed to investigate the satisfaction of the students with activities in the design studios when they used face masks in social distance position.

According to the research questions, the hypothesis of the study is designed based on the following parts:

H0: there is no association between the level of satisfaction of the students with the course outputs and social interaction in the design studios due to wearing face masks and social distance.

H1: there is an association between the level of satisfaction of the students with the course outputs and social interaction in the design studios due to wearing face masks and social distance.

2. Studies on social interactions in the design studios

COVID-19 changed learning activities widely in the world by affecting individuals importantly behavioral patterns, feeling, and psychological modes in terms of internal factors of learner such as safety, anxiety, and depression (WHO, 2022), and the public in terms of protocols to control the spreading through measures such as wearing face masks, social distance and risks in models of education that called external factors (Apriyanti, 2020; Ersin et al., 2020). Salkind highlighted that external factors had clear effects on the behaviors of students in learning activities (Salkind, 2008). Although Webster's dictionary defines "social distance" in terms of a selective behavior based on "acceptance or rejection of social interaction" (Webster, 2022), the major parts of the measures were compulsory to be respected by people in public areas (Buldan, 2021; Ersin et al., 2020). COVID-19 also has set opportunities and challenges in teaching, learning, and assessments (Tafahomi, 2021c). The new situation changed the education approach to speed up blended, online, and distance learning in terms of the available option (Delialioglu and Yildirim, 2007; Gulbahar and Madran, 2009), and some problems such as infrastructure for accessibility of the students to the internet, educational materials, and learning outcomes (Apriyanti, 2020; Naylor and Nyanjom, 2020).

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2.1. Social interaction in classrooms

Studies highlighted a wide range of social interactions in the classrooms and design studios in terms of peer and group learning. For example, the studies referred to the competition, motivation, and learning process through social interaction in the classrooms (Greenwood et al., 2002), active and profound learning, self-discipline, and self-dependent learning outcomes (Ion et al., 2016), and a solution for dissocialized students (Woolfolk, 2016). The studies on the behavioral patterns of students in the landscape design studio highlighted that the students learnt through peers efficiently based on careful watching, copying, modifying, and presenting the activities in the studios to personalize the learning activities. The students applied design boards presentation in the CATs (Continuous Assessment Tests) exam as an opportunity to communicate, interact, and express their learnt lessons (Tafahomi, 2021d; 2021e). Importantly, evidence has shown that peers and groups increased the possibility of social interaction among students (Greenwood et al., 2002; Lee, 2005).

The studies advocated that behavioral patterns of the students in the classroom are constructed based on a process than an event, and included both verbal and non-verbal (Seifert and Sutton, 2009), participatory and compulsory (Chinn, 2011), individual and group activities (Tafahomi, 2021d) and seemingly, all activities of the students in classrooms include a deep root in social, cultural and psychological aspects of students and models of education in the context (Williams and Robert, 1997). Social interaction included strong effects on the character and subjectivity of students in higher education such as competition, cooperation, and grade achievement (Lee, 2005; Woolfolk, 2016). The students not only observe the activities of other students in architectural design studios but also through comments and sharing ideas do daily social interaction to develop the design projects in the terms of dialogues (Schon, 1987).

2.2. Social interaction in architecture design studios

An architectural design studio is specialized in specific activities that take place in the design studio such as sketching, drawing, physical model making and design. This process was constructed based on learning through doing that engages the minds of the students for a process of learning from divergent to the convergent stage (Lang, 1987) through desk-crits, presentations, and receiving comments, and corrections (Schon, 1984; 1987). The design studios included sets of social interactions between instructors and students, students and students and the students and projects to develop architectural projects (Tafahomi, 2021a; 2022) through in an active interaction between participants, the physical environment of the design studio, and the design project (Buldan, 2021). The students used the graphical tools as the common media for the development of design projects that this ability takes place in the design studio through continuous social interaction (Tafahomi and Nadi, 2021). The influence of social interaction among the students is not limited just to the design projects and software but highly affected the personality and subjectivity of the students through the process of watching, doing, and cooperation (Lee, 2005; Woolfolk, 2016; Tafahomi, 2021e). Perhaps, for this reason, Schon defined an architecture design studio as a location for dialogue between the students and instructor to develop design ideas (Schon, 1984; 1987) through desk-crits that have a long history in architecture training and education (Proudfoot, 2000). The instructor of design studios normally arranges the desk-crits based on the individual, peer, and group in different stages of development of the design project (Tafahomi, 2022). This process is constructed based on interactions between the students and instructors regularly during the whole semester through discussion, drawing together, and revising the design ideas to develop the project (Tafahomi, 2021a).

Public and group activities included significant roles in training of the students based on an open studio context and culture in architecture (Schon, 1984; Lang, 1987; Garric, 2017). For example, the study by Salkind revealed that students learn from society, media, and all open context even without any instructor (Salkind, 2008) that have a deep root in the social cognitive theory of education based on a daily process of learning for the learner based on observation, selection, and acquisition (Bandura, 1986). However, wearing face masks and social distance changed normal activities in educational centers. Particularly, the public presentation of the students in the design studios was affected by condition also sitting together for discussion and group works faced many challenges.

In summary, an architecture design project is the core module for training the students and a design studio is a place for learning by doing in the whole program based on a project-based learning approach. Both students and instructors attempt to develop an architectural project through systematic and continuous processes of dialogue, discussion, and interaction. The results of the architectural design studios appear in the design outputs by the students such as drawings, design boards, and physical models. The level of satisfaction of the students in design studios is related to the design outputs and learning outcomes that are constructed based on the communication and interaction in the design studio.

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3. Methodology

3.1. Research design

The studies on the level of satisfaction of the students widely applied questionnaires and interviews based on the quantitative method. Importantly the level of satisfaction of the students was called a psychological aspect of research based on perception (Almquist et al., 2014; Goodwin, 2010; Neuman, 2006; Peers, 1996; Tafahomi, 2021b; Tafahomi, 2021a; Woolfolk, 2016). Similar research also applied statistical analyses for the examination of the results of questionnaires in software such as SPSS (Tafahomi, 2021e). The research methodology resources referred to the different types of questionnaires (Frankfort-Nachmias et al., 2014; Neuman, 2006) that one of the common structures was introduced as the Likert scale (Xi et al., 2017; Yang et al., 2013; Tafahomi, 2021e). Although the Likert scale questionnaire was criticized based on the scales and results (Joshi et al., 2015), this questionnaire was applied widely as a more common way of communication with the respondents in the research activities particularly in the education field of study (De Campos et al., 2020; Hartley, 2014; Huertas-Delgado et al., 2019; Li, 2013).

According to the hypothesis, this research was designed based on a five-scaled Likert questionnaire to evaluate the relationships between the level of satisfaction of the students due to social interaction in design studios with the related activities such as sitting, studying, drawing in design studios when they applied COIVD-19 measures such as wearing face masks and social distance during the pandemic time. The research targeted the important behaviors of the students in the design studio based on group and individual activities. The questionnaire was structured based on the two clusters of questions on the activities, first, individual, peer, or group, and second, the level of satisfaction with the quality of the course, design outputs, and social interactions during the pandemic time when the students used face masks in social distance measure for activities.

3.2. Research process

The questionnaire was drawn based on common activities and processes in an architectural design studio. The activities encompassed both individual and group such as desk-crits, discussion, and studies, physical activities such as physical model making, site visits, study, and drawing, and production and presentation such as drawing and design and pinup presentation in CATs exams. The questionnaire was arranged into two clusters of questions. First, the level of satisfaction of the students was searched in relation to the interaction between users in design studios. Second, the quality of courses and design outputs were inquired in relationship to the studio outputs. The first draft of the questionnaire was shared with a small group of final year's students who passed all design studios and already were more familiar with the design studio activities. The students checked the questions and shared their opinions about the clarity of the questions and related activities in design studios. After that, the questionnaire was sent to two lecturers who worked in the college to get their feedback about the structure of the questionnaire in relation to wearing face masks and social distance measures during the pandemic time. The results of the feedback were integrated into the questionnaire. The questionnaire was uploaded on the Google Form platform and the link to the address was sent to the emails of the students based on the list of emails in the administration office. Although participation in the survey was not compulsory for the students, the level of participation of the student was not sufficient. Three reminders were sent to the students to participate in the online assessment. After three months, a total of 118 of 136 students participated in the research.

3.3. Data and sampling specifications

Data were combined from the answers of the students to the online questionnaire. The statistical research society included 136 participants in terms of the architecture students in the department from the first to the final year of the study. Data were combined from 118 respondents who participated in the survey. The reason for the differences between the numbers was highlighted by the administrative officer based on the wrong email address, disconnection, and low level of access to the internet.

3.4. The context of the research

The research took place in the department of architecture at the University of Rwanda, which included 136 architecture students. Five design studios accommodated the students on the second floor of the department with flexible drawing tables, chairs, and some shelves for archiving the drawing and physical models. It was supposed that both students and instructors respect COVID-19 protocol importantly wearing face masks and social distance. Despite the recommendations on the blended learning models, the architectural design studios took the place as usual on campus with a face-to-face model of teaching.

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The country faced three times lockdowns and compulsory measures to control, monitor, and prevent the epidemic of COVID-19. The measures included wearing face masks, social distance, washing hands and sanitization, running classes with 30 to 50 per cent of the students, and public vaccination. Therefore, the students participated in the design studios with COVID-19 protocol as compulsory activities.

4. Results

The data were analyzed through Descriptive Table and Chi-Square tests in SPSS to understand both individual and interrelation between the answers of the students about the key criteria in the evaluation of the quality of the activities in the design studios.

4.1. Descriptive table

The data demonstrated that the presentation, communication, and discussion took place with the high level of satisfaction in the design studio by the respondents even when they used to wear face masks and social distance (Table 1). However, drawing, design, studying, and sitting together were not among the selected list of items and seemingly, the students faced problems with achievements of activities.

Despite the high level of selection for the items that referred to the "lecturers delivered the course sufficiently" in the second part, other items were selected with a minimum rate in Table 1. Importantly, the students identified the quality of social interaction, physical environment, and facility and equipment in the design studio as the lowest items on the satisfaction list. The results revealed the space and facilities were not supported social interaction by wearing face masks and social distance. However, the items such as desk-crits, outputs of the design studios, and quality of the course got more marks than other factors.

Table 1. The descriptive table of data

No	Questions	Mean	Median	Mode
Q1	The clarity of the voice	3.12	3.16	3
	Working with the other students in the design studio			
Q2	Sitting as a peer or group together	3.03	3.16	4
Q3	Studies as a peer or group together	3.04	3.12	3
Q4	Site visiting as a peer or group together	3.18	3.28	4
Q5	Drawing as a peer or group together	2.97	3.04	3
Q6	Design as a peer or group together	2.84	2.91	3
Q7	Making physical models as a peer or group together	3.07	3.10	4
Q8	Pinup the design boards as a peer or group together	3.19	3.37	4
Q9	Presentation as a peer or group together	3.36	3.48	4
Q10	Communication with the peer or group	3.41	3.48	4
Q11	Discussion with the peer or group	3.35	3.45	4
Q12	Sufficient spaces for each group for learning activities	3.15	3.19	3
	Satisfaction of the students about activities in the design studios			
Q13	Lecturers derived the course sufficiently	3.10	3.24	3
Q14	The quality of the course was sufficient	2.84	2.93	3
Q15	The students preformed sufficiently	2.58	2.69	3
Q16	The outputs of the design studio were sufficient	2.78	2.87	3
Q27	The quality of social interaction was sufficient	2.40	2.44	2
Q18	The quality of social communication was sufficient	2.67	2.73	3
Q19	The quality of the desk-crits was sufficient	2.86	3.05	3
Q20	Physical environment was sufficient	2.55	2.63	3
Q21	Facilities and equipment were sufficient	2.41	2.52	3

4.2. Chi-square tests

The Log of the design activities and the satisfaction is presented in table 2. According to the table and information (N=1941.495, df=1800, p=.010), there was a statistical association between activities in the design studios and the level of satisfaction of the students. Therefore, the H0 was rejected, and the H1 was approved.

To see the level of association between different items, the groups of answers from the students about the activities in design studios and the level of satisfaction were analyzed through a chi-square test. The results

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illustrated that the level of satisfaction with the social interaction and physical conditions were more associated with other items in design studio activities than other factors.

Table 2. The chi-square of log studio activities and the satisfaction

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1941.495[a]	1800	.010
Likelihood Ratio	557.050	1800	1.000
Linear-by-Linear Association	22.761	1	.000
N of Valid Cases	118		

a. 1886 cells (100.0%) have expected count less than 5. The minimum expected count is .01.

In detail, the social interaction was statistically associated with the siting together (N=43.127, df=16, p=.000), studies together (N=40.312, df=16, p=.001), site visit together (N=34.001, df=16, p=.005), drawing together (N=51.526, df=16, p=.000), design together (N=37.923, df=16, p=.002), making physical model together (N=37.490, df=16, p=.002), pinup as peer or group (N=60.698, df=16, p=.000), presentation in peer or group (N=41.197, df=16, p=.001), communication in peer or group (N=31.646, df=16, p=.011), discussion in peer or group (N= 37.572, df=16, p=.002), sufficient space for peer or group activities (N=43.396, df=16, p=.000). There was enough evidence to show that the social interaction was statistically associated with selected items. Therefore, the H0 was rejected and the H1 was confirmed.

The physical condition of the design studio was statistically associated with sitting together (N=39.349, df=16, p=.001), studies as a peer or a group (N=36.055, df=16, p=.003), site visits as a peer or a group (N=41.360, df=16, p=.000), drawing as a peer or a group (N=26.622, df=16, p=.020), design as a peer or a group (N=40.260, df=16, p=.001), making physical model as a peer or a group (N=37.056, df=16, p=.002), pinup as a peer or a group (N=27.595, df=16, p=.035), presentation in a peer or a group (N=43.370, df=16, p=.000). Chi-square analyses demonstrated that physical environment of the design studios statistically associated with the level of satisfaction of the students in working in design studio while wearing face masks and social distance in which H0 was rejected and the H1 was approved.

The desk-crits activity was the most effective factor in the level of satisfaction of the students in the design studio when they used to wear face masks and social distance. The level of satisfaction of the students with the desk-crits in the design studios was statistically associated with the quality of voice during the desk-crits (N=28.182, df=16, p=.031), the sitting together as a peer or a group (N=27.468, df=16, p=.037), studies as a peer or a group (N=34.198, df=16, p=.005), site visit as a peer or a group (N=27.557, df=16, p=.036), making physical model as a peer or a group (N=32.752, df=16, p=.008), presentation as a peer or a group (N=26.509, df=16, p=.047). Chi-square analyses demonstrated that desk-crits in the design studios were statistically associated with the level of satisfaction of the students in working in design studios while wearing face masks and social distance in which H0 was rejected and the H1 was approved.

Other factors were just associated with a few items. For example, the communication item was just associated with the design as a peer or group (N=30.456, df=16, p=.016), making the physical model as a peer or a group (N=31.959, df=16, p=.010), pinup as a peer or a group (N=32.581, df=16, p=.008), presentation in a peer or a group (N=42.051, df=16, p=.000), and discussion as a peer or a group (N=26.989, df=16, p=.042). Those items were statistical evidence to demonstrate an association between communication and the level of satisfaction of the students.

5. Findings

The results of the analysis demonstrate that the students believed three items were important to create social interaction in the design studios including presentation, communication, and discussion. This result highlights that the presentation of the design productions in the CATs facilitated social interaction between the students or group of students in the design studio through communication and discussion even when they apply wearing face masks and social distance. However, the physical environment, facility and equipment, and social interaction are the missing aspects in the selection list of the students for the quality of social interaction when they used face masks at a social distance. In a contradictory way, three items marked by the students frequently importantly, desk-crits, outputs of design studio and the quality of the course that reveal a system of individual activity in the desk-crits to achieve the expected design outputs and learning outcomes. Apparently, the individual desk-crits were an important factor in the social interaction in the design studios during the pandemic time. The level of satisfaction of the students with the answer to the questionnaire emphasizes this finding.

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The chi-square test highlights that generally there is a statistical association between the activities in the design studios with wearing face masks and social distance and the level of satisfaction of the students based on the Log of the satisfaction and design studios activities. However, the detailed analysis between each item and factor shows that some of the activities are more impartment for the student during the pandemic time to keep the studio more fruitful. For example, the students highlight sitting, studying, site visits, drawing, designing, making physical models, pinup, presenting, communicating, and discussing as a peer or a group are the important factors in social interaction. These results refer to the public activities of the students in the design studios as a more adapted way for social interaction.

The physical environment and conditions of the design studios also support social interactions between the students when they are wearing face masks at a social distance. For example, the students underline again the sitting, studies, site visit, drawing, design, making physical models, pinup, presentation, communication, and discussion as a peer or a group in terms of the important factors in social interaction. These items demonstrate the physical condition of the design studios could provide sufficient sitting for the behavioral patterns of the students to support social interactions.

Nonetheless, the desk-crits importantly individual desk-crits is a significant factor for the students to be satisfied with the quality of the course and design outputs during the pandemic time when they used face masks at a social distance. Some factors are highlighted by the students importantly sitting, studies, site visits, making physical models, and presentation as a peer or group. Other items such as communication, discussion, and design did not statistically associate with the desk-crits. This selection reveals that those activities between the students and the instructors of the design studio as one-by-one interactions are more relevant to the design outputs assumptions and quality of the course but in a more private way than public communication. In other words, the students personalized the process of learning in the design studios based on the individual desk-crits to achieve the expected results through more personal, individual, and private activities by wearing face masks and social distance during the pandemic time. Figure 1 represents this cluster of items.

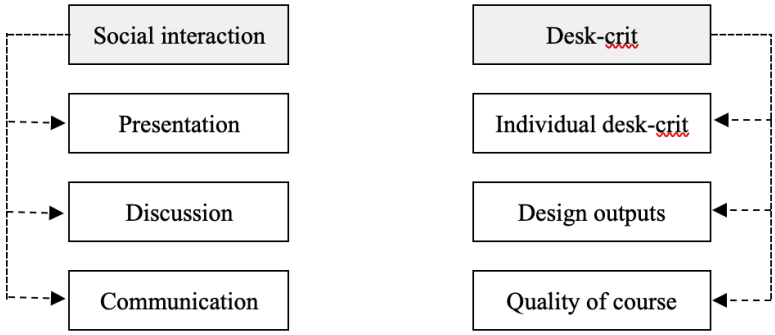

Figure 1. The Role of social interaction and desk-crit in design studios

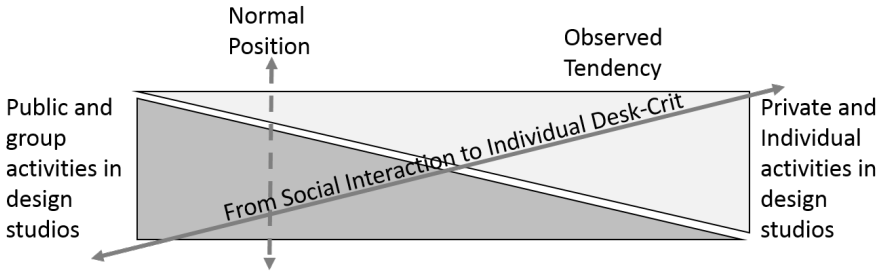

Figure 2. The shifting of the public activities to private activities during the pandemic time

Despite the statistical association between the social interaction in design studios and the level of satisfaction of the students based on the Log test, the detailed chi-square test for each item highlights different levels of social interactions between the students during the pandemic times. For example, the communication factor did not statistically associate with quality of voice, sitting, studies, site visits, and drawing as a peer or group. However, these items statistically are associated with social interaction. This result demonstrated that the students apply a wide range of activities for social interaction that perhaps communication is not part of them such as cellphones and

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social media. Although social media was not part of the research purpose for the investigation, the result of the studies reveals a variety of communication for social interaction between the students but not public-based rather than private-based. This result demonstrates a transitional process of activities in the design studios from public to private, from group to individual, and from common to personal patterns of activities that certainly wearing face masks and social distance are important factors during the pandemic time. Figure 2 represents this shifting position.

6. Discussion

The findings of the research identified that the students highlighted three factors as the main elements for social interaction in the design studios including presentation, communication and discussion when they used face masks at a social distance. This result revealed that the students referred to the public activities in the design studios that were discussed in studies such as active learning (Greenwood et al., 2002), socialization (Woolfolk, 2016), and profound learning (Ion et al., 2016) based on group activities. However, the results were closer to the traditional activities in the design studios in terms of dialogue between the instructors and the students through comments and crits (Proudfoot, 2000; Schon, 1987). In this way, the students attempted to develop architectural design projects during the pandemic time based on the frequent discussion with the instructors in both presentations and desk-crits that this result confirmed the powerful relationships between the students and instructors that were discussed by Tafahomi (2021a; 2022).

Although the students did not mark the physical environment, facilities, and equipment of the design studios as important factors in the descriptive table, the chi-square results contradicted the frequencies and demonstrated that the physical environment and equipment were important items to facilitate social interaction in design studios. This contradiction highlighted the effects of the physical environment on both design activities (Tafahomi, 2021b) and social distance as a measure (Apriyanti, 2020; Ersin et al., 2020). In fact, the chi-square analysis illustrated that the physical conditions of the design studios were related to both the private and public activities of the students. In fact, the space of the design studios did not change so much due to the pandemic. Therefore, the students did not observe, feel, or percept any change in the context of the study due to wearing face masks and social distance, and continued to fulfil the tasks of the design projects, and perhaps for this reason the direct selection of the items was so low. This result was in the same line with the findings of the studies that highlighted learning through watching, doing, and cooperation (Lee, 2005; Woolfolk, 2016; Tafahomi, 2021e).

The desk-crit was a significant item that was highlighted by the students, particularly the individual desk-crits. The individual desk-crits were a crucial factor for the students to evaluate the quality of the course and the design studio's outputs with a high level of satisfaction. It referred to the key point of Schon in terms of continuous dialogue between the students and the instructors in the design studios for the development of design projects (Schon, 1984; 1987) and the point of Proudfoot (Proudfoot, 2000) in terms of a deep tradition in training of the students in architecture education. However, the desk-crits did not statistically associate with communication and discussion that it referred to the individual activities of the students in the design studios than public activities. This result contradicted the finding of the studies with a focus on peer and group learning in the landscape design studios in terms of presentation, communication, and interaction (Tafahomi, 2021e; 2021d). Therefore, the CATs exam as a public presentation did not contribute to the social interaction of the students rather than individual desk-crits did.

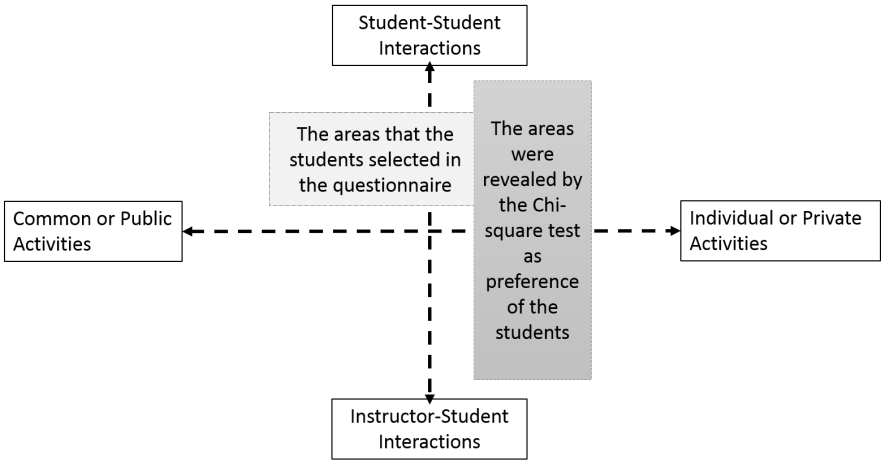

Figure 3. The tendency of the students toward individual activities in design studios

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The results revealed that the students preferred individual desk-crits while wearing face masks at a social distance than group desk-crits as common activities in design studios. This preference exposed an individualism trend in the design studios due to the pandemic conditions. This result criticized the theory of Schon in terms of an open studio for dialogue (Schon, 1984; 1987). However, this finding was supported by the studies on social and context reflections (Williams and Robert, 1997), roles of verbal and non-verbal communication (Seifert and Sutton, 2009), and participatory activities in education (Chinn, 2011). In fact, although studies referred to the character and subjectivities of the students in the behavioral patterns in the classroom (Lee, 2005; Woolfolk, 2016), this common trend between the students disclosed a new achievement of the students to personalize the learning model due to the circumstances in the pandemic time that was highlighted in terms of a personalized procedure by the students (Tafahomi, 2021a) that referred to the external factors in education (Salkind, 2008). This personalization process was also mentioned by (Bandura, 1986) as daily learning through observation, selection, and acquisition in education. Figure 3 attempts to illustrate this trend among the students.

Although this model of desk-crits was not a new style for interaction between the students and instructors, when the whole students in a program applied it, could demonstrate the level of impact weaning face masks and social distance during the pandemic in teaching, learning, and assessment models in higher education (Apriyanti, 2020; Ersin et al., 2020; WHO, 2022), particularly architecture education that all time tried to be different from other fields of study (Garric, 2017; Lang, 1987; Proudfoot, 2000; Schon, 1987). Therefore, for this reason, the quality of voice through wearing face masks and at a social distance received high marks from the students that referred to a close distance between the students and instructors for an individual desk-crits activity rather than group desk-crits. The self-discipline and self-dependent achievements of students were highlighted by the study to advocate innovation of the students in the learning process (Ion et al., 2016) in terms of social cognitive theory in education (Bandura, 1986). The shifting from peer and group desk-crits to individual desk-crits by the students could be assumed as a new way of communication and social interaction when wearing face masks and social distance was compulsory during the pandemic time.

7. Conclusion

COVID-19 changed the educational system widely in the world and particularly in developing countries. Apparently, none of the educational centers was ready for such impacts on the students, lecturers, and way of education in an uncertain time. The compulsory measures in the universities attempted to control the pandemic through some common techniques importantly wearing face masks and social distance. Architecture design studios are celebrated in terms of social interaction in a common open space for collaboration between students and instructors for architectural design projects. Despite the peer, group, and public desk-crits as a style in design studios, the pandemic changed this style to a more private style.

Wearing of face masks and social distance between the students and instructors reduced the quality and quantity of the activities in the design studios due to the quality of the voice, communication and discussion in the design studio openly. The students reduced the peer, group activities importantly the desk-crits, and shifted it to individual desk-crits. The students believe the course was successful and lecturers delivered their job successfully during the pandemic time due to the individual desk-crits. Apparently, this shifting from common to individual desk-crits was an adaptation to the condition due to the compulsory measures on the campus that make possible social interaction in the design studios in an applicable way.

The results reveal that some common activities in the design studios such as presentation, communication, and discussion were not associated with the level of satisfaction the students about the quality of the course although normally they play a significant role. In fact, the students discover the quality of the course and social interaction in other factors such as sitting, studying, drawing, and designing as a peer in a more private form of interactions. The social interaction shifted from common activities to the relationships between a student with their own project, a student with an instructor, and a student with another student in a more private, individual, and personalized style.

Architecture departments need to take into account such kind of a pandemic in terms of design challenges for both physical and nonphysical intervention and innovation. The physical interventions could be included effective ventilation, flexible partition walls to separate the area of work, and sufficient equipment to reduce the contestation of the students. The nonphysical of the design studios could be encompassed the supportive culture of working with the students with instructors, peers, and groups in the design studio as the general progress of the design projects. This culture needs to be planted in the first year of the study architecture program to lead the students to more collaboration than the competition in the design process.

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While architecture programs enjoy a long background in the training of the students in the specific discipline, paying more attention to the educational psychology achievements in recent years certainly could boost the education outcomes, particularly in uncertain conditions. The common understanding of relationships between the proportion of group and individual activities among the students in the personalization process of learning facilitates the leadership activities of instructors. Familiarity with the motivation of students for social interaction in design studios promotes the level of studio outputs based on cooperation, collaboration, and teamwork even during the pandemic.

Author contribution statements

The author contributed all to the research's design and implementation, the analysis of the results, and the writing of the manuscript.

Disclosure statement

The author reported no potential conflict of interest.

Ethics committee approval

All responsibility belongs to the researcher. All parties were involved in the research of his own free will.

References

Almquist, Y. B., Ashir, S., & Brännström, L. (2014). *A guide to quantitative methods*. Stockholm: Stockholm University, Sweden. Retrieved from www.chess.su.se/methods

Apriyanti, C. (2020). The parents' role in guiding distance learning and the obstacle during covid-19 outbreak. *Jurnal Ilmiah Pendidikan Dasar*, 7(2), 68-83. https://doi.org/http://dx.doi.org/10.30659/pendas.7.2.68-83

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice-Hall.

Buldan, E. (2021). Situated learning in online architectural studio education. *Journal of Design Studio*, 3(1), 59-70. https://doi.org/10.46474/jds.930642

Chinn, C. A. (2011). *Educational psychology: Understanding students' thinking*. Rutgers University: New Jersey.

De Campos, C. I., Pitombo, C. S., Delhomme, P., & Quintanilha, J. A. (2020). Comparative Analysis of Data Reduction Techniques for Questionnaire Validation Using Self-reported Driver Behaviors. *Journal of Safety Research*, 73, 133-142.

Delialioglu, O., & Yildirim, Z. (2007). Students' perceptions on effective dimensions of interactive learning in a blended learning environment. *Educational Technology & Society*, 10 (2), 133-146.

Dizdar, S. D. (2015). Architectural education, project design course and education process using examples. *Procedia - Social and Behavioral Sciences*, IETC 2014, 176, pp. 276 – 283.

DoA. (2012). *Architecture program specification*. Kigali : Department of Architecture, The University of Rwanda.

Draper, J. (1977). The Ecole des Beaux-Arts and the architectural profession in the United States: The case of John Galen Howard. In S. Kostof, *The architect* (pp. 209–238). New York: Oxford University Press.

Drexler, A. (1975). *The architecture of the Ecole des Beaux Arts*. New York: The Museum of Modern Art.

Ersin, P., Atay, D., & Mede, E. (2020). Boasting preservice teachers' competence and online teaching readiness through e-practicum during the COVID-19 outbreak. *International Journal of TESOL Studies*, 2(2), 112-124. https://doi.org/10.46451/ijts.2020.09.09

FAED, F. (2009). *Program specification of architecture*. Kigali: the University of Rwanda.

Frankfort-Nachmias, C., Nachmias, D., & DeWaard, J. (2014). *Research methods in the social sciences* (8 ed.). New York: SAGE Publisher Ink.

Garric, J.-P. (2017). The French Beaux-Arts. In M. Bressani, & C. Contandriopoulos, *The companions to the history of architecture, volume III, nineteenth century architecture, part I: Historicism, the Beaux-Arts, and the Gothic* (pp. 1-15). New York: John Wiley & Sons, Inc.

Goodwin, J. C. (2010). *Research in psychology methods and design*. Hoboken: John Wiley & Sons, Inc.

Greenwood, C. R., Maheady, L., & Delquadri, J. (2002). Classwide peer tutoring programs. In M. R. Shinn, H. M. Walker, & G. Stoner, *Interventions for academic and behavior problems II: Preventive and remedial approaches* (pp. 611–649). Bethesda, MD.

Gulbahar, Y., & Madran, R. O. (2009). Communication and collaboration, satisfaction, equity, and autonomy in blended learning environments: A case from Turkey. *International Review of Research in Open and Distance Learning*, 10 (2).

Hartley, J. (2014). Some Thoughts on Likert-type Scales. *International Journal of Clinical and Health Psychology*, 14(1), 83-86.

ISSN: 2149-5939

Huertas-Delgado, F. J., Garcia, M. J., Van Dyck, D., & Chillon, P. (2019). A Questionnaire to Assess Parental perception of Barriers towards Active Commuting to School (PABACS): Reliability and validity. *Journal of Transport and Health*, 12, 97-104.

Ion, G., Barrera-Corominas, A., & Tomàs-Folch, M. (2016). Written peer-feedback to enhance students' current and future learning. International *Journal of Educational Technology in Higher Education*, 13(15), 1-11. https://doi.org/10.1186/s41239-016-0017-y

Joshi, A., Kale, S., Chandel, S., & Pal, D. K. (2015). Likert scale: Explored and explained. *British Journal of Applied Science and Technology*, 7(4), 396-403.

Lang, J. (1987). *Creating architectural theory: The role of the behavioral sciences in environmental design.* New York: Van Nostrand Reinhold.

Lee, S. W. (2005). *Encyclopedia of school psychology*. Thousand Oaks, California: Sage Publications.

Li, Q. (2013). A Novel Likert Scale Based on Fuzzy sets Theory. *Expert System with Application* , 40(5), 1906-1618.

Marinoni, G., Land, H., & Jensen, T. (2020). *The impact of COVID-19 on higher education around the world*. Published by the International Association of Universities.

Mckeever, A. (2022). *Do masks really harm kids? Here's what the science says*. Retrieved from National Geography : https://www.nationalgeographic.com/science/article/do-masks-really-harm-kids-heres-what-the-science-says

Naylor, D., & Nyanjom, J. (2020). Educators' emotions involved in the transition to online teaching in higher education. *Higher Education Research & Development*, 40(6), 1236-1250. https://doi.org/10.1080/07294360.2020.1811645

Neuman, L. W. (2006). *Social research methods: Qualitative and quantitative approaches*. New York: Pearson Education.

O'Hagan, F., Capell, D., & Metaxas, C. (2022). *Teaching with a mask. Retrieved from Trenttu:* https://www.trentu.ca/teaching/teaching-mask

Peers, I. (1996). *Statistical analysis for education and psychology researchers*. London: The Falmer Press.

Proudfoot, P. R. (2000). Structuralism, phenomenology and hermeneutics in architectural education. *International Journal of Architectural Theory*, 2, 1-17.

Salkind, N. J. (2008). *Encyclopedia of educational psychology*. London: SAGE Publications Ltd.

Schon, D. A. (1984). The architectural studio as an exemplar of education for reflection-in-action. *Journal of Architecture Education*, 38, 2-9.

Schon, D. A. (1987). *Educating the reflective practitioner: Toward a new design for teaching and learning in the professions*. San Francisco: Jossey-Bass Publishers.

Seifert, K., & Sutton, R. (2009). *Educational psychology. Zurich*, Switzerland: The Global Text Project.

Tafahomi, R. (2021a). Insight into a personalized procedure of design in concept generation by the students in architecture thesis projects. *Journal of Design Studio*, 3(1), 5-18. https://doi.org/10.46474/jds.910234

Tafahomi, R. (2021b). The preferences of the students to select the seating position in the architecture design studios. *Erciyes Journal of Education*, 5(2), 105-120. https://doi.org/10.32433/eje.940783

Tafahomi, R. (2021c). Application of Blended Learning through Practical Project-based Instruction: Opportunities and Constraints. *Pedagogi: Jurnal Ilmu Pendidikan*, 21(2), 77-89. https://doi.org/10.24036/pedagogi.v21i2.1093

Tafahomi, R. (2021d). The Behavioral Patterns of the Student in the Position of Peer-Jury in Landscape Design Studio. *EDUCATUM – Journal of Social Science*, 7(2), 57-65. https://doi.org/10.37134/ejoss.vol7.2.6.2021

Tafahomi, R. (2021e). Learning activities of the students in peer-jury practices in the architecture design studio. *AKSARA: Jurnal Ilmu Pendidikan Nonformal*, 7(3), 795-814. https://doi.org/10.37905/aksara.7.3.795-814

Tafahomi, R. (2022). Insight into Research Dilemma in Design Studios and Relationships with the Architecture Curriculum. *Journal of Design Studio*, 4(1), 93-112. https://doi.org/10.46474/jds.1102633

Tafahomi, R., & Nadi, R. (2021). The interpretation of graphical features applied to mapping SWOT by the architecture students in the design studio. *Journal of Design Studio*, 3(2), 205-221. https://doi.org/10.46474/jds.1019310

Webster. (2022, 04 13). A Guide to Coronavirus-Related Words. Retrieved 08 16, 2022, from Webster: https://www.merriam-webster.com/words-at-play/coronavirus-words-guide

WHO. (2022, 03 02). *COVID-19 pandemic triggers 25% increase in prevalence of anxiety and depression worldwide*. Retrieved 08 16, 2022, from World Health Organization: https://www.who.int/news/item/02-03-2022-covid-19-pandemic-triggers-25-increase-in-prevalence-of-anxiety-and-depression-worldwide

Williams, M., & Robert, L. B. (1997). *Psychology for language teachers*. Cambridge: Cambridge University Press.

Woolfolk, A. (2016). *Educational psychology*. Boston: Pearson.

Xi, L., Yuan, Z., YunQui, B., & Chiang, F.-K. (2017). An investigation of university students' classroom seating choices. *Journal of Learning Spaces*, 6(3), 13-22.

Yang, Z., Becerik-Gerber, B., & Mino, L. (2013). A study on student perceptions of higher education classrooms: Impact of classroom attributes on student satisfaction and performance. *Building & Environment*, 70(15), 171-188.

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