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The Preferences of the Students to Select the Seating Position in the Architecture Design Studios

Rahman Tafahomi

University of Rwanda, College of Science and Technology

ABSTRACT

Both seating arrangement and position have been one the problematic topic in educational studies, particularly in higher education. There is a large body of studies on the seating arrangement; however, an architectural design studio is specialized in different activities and interaction that challenges the classical form of arrangement. For this reason, the students arrange, rearrange, and disarrange the seating arrangement and position in the studio. This study aimed to investigate the relationship between the viewpoints of the students with seating arrangement positions to find out the students' preferences to select seating positions. Both quantitative and qualitative methods were applied to analyze data. The Likert questionnaire with fifteen criteria analyzed variables through chi-square, mode, and the graphical analysis illustrated important aspects of the seating arrangements in the department of architecture, the University of Rwanda. The findings addressed that students preferred to use a U-shaped classroom and studio and five statistical criteria supported the association between the viewpoint of students and seating arrangement including the trend to personalize the position, to teamwork activity, to sit close lecturers, to enhance their position. Although other criteria statistically did not associate with the seating arrangement, the cross-tabulation table address that the rear seats in the studio were more preferable for students due to the visual corridor to the front, monitoring, and eye contact.

Keywords: Architectural design studio, seating arrangement, seating position, preference of the students, viewpoint of the students.

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1. Senior Lecturer, Dr. Architecture, tafahomi@gmail.com, https://orcid.org/0000-0002-7172-1302

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INTRODUCTION

Arrangement of spaces for educational activities plays a significant role in the process of students' training in architectural design studios. Students spend a major part of the learning time in the studios although there are some theoretical classes such as history, theory, and common modules to run in normal classrooms. However, both theoretical and practical modules hold in the design studios in the architecture department at the University of Rwanda. Therefore, studios not only are the main spaces for teaching, learning, and assessment but there are also spaces for interaction and communication. The studios include drawing tables, chairs, boards for writing and projecting, and some shelves for the archiving of the products, so, everyone has their own seating position based on the position of the drawing table although the form of arrangement may change based on trends of the students or lecturers' decisions. The students arrange, rearrange, and disarrange both drawing tables and the seats to adapt to the learning activities, programs, and objectives. Seemingly, understanding the desire, perception, and preference of the students in the studio could open a new perspective for teaching, learning, and pedagogy in the architecture programs.

There are studies to theorize the relation between the classroom arrangement, environment, and education (Downer et al., 2007; Martin, 2006), performance (Kalinowski & Taper, 2007), and behavioral patterns (Van den Berg & Cillessen, 2015; Wilkerson et al., 2015). The studies have addressed the horizontal and vertical, raw-column, and raw long-table arrangement to support different purposes (Hue & Shing, 2008) with adaptation to the tests-exam (Bonus & Riordan, 1998), to reduce inappropriate behaviors (Fernandes et al., 2011; Wannarka & Ruhl, 2008).

However, the major part of the seating arrangement studies has taken the place in the classroom of schools than higher education. For example, previous studies mentioned that the seating position was arranged on the raw-column structure until 1970 (Weinstein, 1979), and plain structure of classroom without decoration (Manfre, 1976). The studies classified classroom structure in the three categories including raw-column, cluster, and U-shaped (Simmons et al., 2015; Weinstein, 1979; Weinstein, 1992).

The precedents studies have shown movements from the raw-column arrangement to the joined, cluster and U-shape based on the paradigm-shifting from subject-oriented to the student-oriented (Gremmen et al., 2016). However, Yang et al. (2013) criticized that traditional forms of the classroom such as raw, circular, and joined forms no longer are sufficient forms for the studies on higher education and it needs to a new generation of classrooms such as distance, auditorium, and discussion forums. Bonus and Riordan (1998) highlighted that each classroom arrangement supports a specific purpose for the specific curriculum and course than a general form. For this reason, Bicard et al. (2012) theorized that the seating position and arrangement in a classroom should be flexible, changeable, and varied in the teaching times periodically.

It seems there is a gap in the seating arrangement studies particularly in the architectural design studios. For example, despite the classroom arrangement demonstrates the philosophical approach of instructors in managing the classroom Kuzborska (2011), the study identified that classrooms were managed in a very general way (Gremmen et al., 2016). McKeown et al. (2015) and Gremmen et al. (2016) criticized that knowledge of instructors in the class arrangement follows a classical style than purpose-based. For this reason, one of the studies concluded that teachers should be trained to deal with the seating position (Infantino & Little, 2005). Xi et al.

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(2017) reported that despite the major differentiation between classrooms with 10 students, then classrooms with 200 students, studies on the effect of number on students in the environment of the classroom have been rare. Another study argued that teaching new knowledge in the old building, spaces, and seating arrangement is not possible (Beckers et al., 2016). Daly and Suite (1981) claimed that teachers were driven by prejudgment about the seating position of students than the real activities they do in classrooms, and they believed to a significant effects of the seating position on the performance of students (Fernandes & Huang, 2012).

Burden has alluded factors as the main reciprocal components in education condition including individual characters, behavioral patterns, and environmental conditions (Bandura, 1986), in terms of the invisible curriculum (Taylor & Vlastos, 2009) that have affected the learning condition of students (Williams & Robert, 1997). Pederson theorized that behavioral patterns of the students have been flexible based on the teachers, students, and classroom environment (Pedersen, 1994). However, the ratio and the proportion and effectiveness condition did not develop yet. Particularly, Vander Schee (2011) realized that there are varieties among the students to select seating positions when they are free to select.

The department used the normal classes and the laboratories tables as a temporary location with the fixed tables and chairs, it is a common observation that now the students change continuously the drawing tables and chairs in design studios in the new location. Therefore, processes of changing seating arrangements create the research questions as below:

- Is the seating arrangement part of the adaptation of the educational environment in design studios for the students?
- Is there any evidence for the seating selection by the students?
- In addition, is there any relationship between the viewpoint of the students and the seating arrangement in the design studio?

In this regard, the hypothesis of this research is based on the associations between the viewpoint of the students and seating position in the architecture design studios. The hypothesis is targeted to check six preferences of students including to personalize the seating position, to work in a group than lonely, to be an active leader than a passive member, to be best in the studio, to sit close to lecturer than friends, and effects of seating position on the design products. For this hypothesis, some questions are designed to discover, if there is associations with those point of views, patterns of the seating arrangement. Therefore, the hypothesis of the research is formulated as:

- H0: there is no association between the viewpoint of students and the choosing of the drawing-table-position in the studio and the seating arrangement in the classroom.
- H1: there is association between the viewpoint of students and the choosing of the drawing-table-position in the studio and the seating arrangement in the classroom.

Arguments on Seating Position

The study theorized that seating arrangement is an essential part of facilitating the educational objectives than just furniture (Cinar, 2010). The seating arrangements support specific purposes in the classroom, for instance, the raw-column for the formal education system (Wannarka & Ruhl, 2008) and top-down authority (Salkind, 2008). The joined table addressed increasing the

level of peer to peer learning (Callahan, 2004) and positive influence of peers on the personality of the students (Burke & Sass, 2013) to reduce the aggressive behaviors (Van den Berg & Cillessen, 2015) with a background in mid of 20th century (Gump, 1987; Steinzor, 1950).

The circular, square, horseshoes, and U-shaped arrangements (Scrivener, 2005) were designed for discussion, cooperation, and social interaction activities (Bonus & Riordan, 1998; Kregenow et al., 2011). The studies listed advantages for U-shaped arrangement such as on-task behaviors (Rosenthal et al., 1985), asking more questions (Marx et al., 2000), better performance (Xi et al., 2017), better view (Vander Schee, 2011), and distractive (Wasnock, 2010).

In another perspective, researchers paid more attention to the physical specification of classrooms. For example, Callahan (2004) attempted to design an arrangement for the effective quality in classroom in relation to the architectural and physical aspects of classrooms. Cheryan et al. (2014) and colleagues focused on the light, ventilation, noise, and physical condition to consider how those elements influence the learning process. The studies took into consideration temperate of classrooms (Dunn & Dunn, 1979), the lighting policy and influences on the students' behaviors (Wilkerson et al., 2015), dimensions of the classroom (Black, 2007; Gifford, 2002), noises (Barrett et al., 2013) and free circulation and seating position in the classroom (Tanner, 2009). Doctoroff (2001) realized that material and the form of the chairs in the classroom influences the learning process, and Kaya and Burgess realized the effects of chairs with handlebars with more scores (Kaya & Burgess, 2007), and varies of chairs in the classrooms and effect on the learning outputs (Eugene & Melaine, 2013).

On the other hand, there is a group of researchers who believe that the psychosocial aspects of the students such as the cultural background, contextual aspects, personality, and home living styles (Haghighi & Jusan, 2012; Hemyari et al., 2013; Kaya & Burgess, 2007; Salkind, 2008). For instance, Kaya and Burgess (2007) realized that the students personalize the location with their own material and equipment. Bakare (2012) concluded that seating arrangement includes positive effects on the creation, presentation, and acquisition of knowledge in the classroom. This specification of the space mentioned earlier by Wiles (1978) as the personal space in the classroom, which this personalization of the space influences the process of the learning of students in the classroom.

The behavioral aspects were discussed widely including the sitting on the front than the rear (Ayikwei, 2016), interaction between students (Dunn & Dunn, 1979), more asking questions (Marx et al., 2000), high interaction between students and peer group in the semi-circular (Fernandes et al., 2011), increasing of relationship in the cluster form (Van den Berg & Cillessen, 2015), and the personality and the seating position (Hemyari et al., 2013). Another group studied the influences of the disruptive behavioral patterns in the classroom (Salend & Sylvestre, 2005), positive behavior in the classrooms (Wannarka & Ruhl, 2008), changing environment of the classroom through rearrangement of seats (Guardino & Fullerton, 2010), and supporting process of leaning (Gest & Rodkin, 2011).

There are studies that have been interested in the relation between the seating position and social interaction. For example, Kaya and Burgess (2007) classified students into three locational categories including interactive: seating in the front, participators in the sides, and isolated in the rear, with some similarity to the theory of the action zone to rationalize the front and center position as an active area for study in classification (Bradova, 2012). The theory hypothesized that

the students seating in the front could achieve more results (Burda & Brooks, 1996; Parker et al., 2011), interactive, practical, and productive (Totusek & Spicer, 1982), and leadership achiever (Pederson et al., 1987). The studies mentioned that seating in the rear have involved lower marks, attendance, and attention (Zomorodian et al., 2012), and the groping seating position enhances the level of students' performance (Gillies, 2003; Siegel, 2005). However, studies criticized that high-graded students continued to grade by changing the position from front to rear (Perkins & Wieman, 2005) and the seating arrangement is related to the personality of the students and identified correlation (Totusek & Staton-Spicer, 1982).

Nonetheless, the major part research body has been done in schools than higher education (Meeks et al., 2013), and significantly major part of these studies took the position in the normal classes than collaborative (Xi et al., 2017). Also in a more radical point of view, researchers believed that the learning in higher education is a personal experience than effects of a classroom (Kolb & Kolb, 2005), which Lippman (2010) paraphrased that the students influence the educational environment than the classroom.

On the opposite side, another group of studies believes that there is no, less, or indistinctive association between the seating arrangement, position and location with any effect on the students' personality, performance, and behavior. For, example, Jones criticized that there is neither association in the T-action zone, in the classroom (Jones, 1990), nor clear evidence about the effects of seating in the rear or front (Kalinowski & Taper, 2007) on the learning and the performance (Armstrong & Chang, 2007). Xi et al. (2017) demonstrated that the result of the seating position has differed in the raw classroom, U-shaped, and auditorium due to the size, form, and number of users. Therefore, seating positions could be effective just in the schools and not in higher education system (Perkins & Wieman, 2005).

In summary, three key approaches have been involved in the seating position and relationship with other aspects of the environment of the classroom, which could classify as physical, psychological, and class achievement. In the physical approach, studies analyzed the physical elements to discover the influences on the behavior patterns and outcomes of students such as classroom size, form, light, height, noise, ventilation, and equipment. In the psychosocial approach, the outputs of studies have highlighted the cultural background, personality, and instructor roles in the classroom to design the classroom environment. The third group of studies, they have focused on the classroom environment, performance, and mark achievement. These three groups were summarized in Table 1 below.

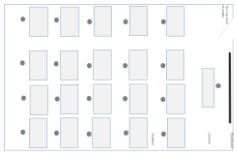
Table 1. *Mapping of the relationship between areas of studies and form of the classrooms*

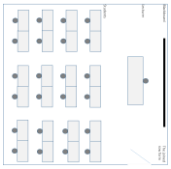
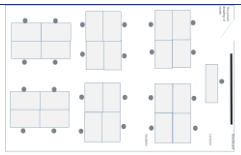
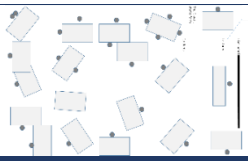
Topics of Analysis	Aspects/ Forms	Raw form	Joined raw	Cluster form	U-Shape
Physical Aspects of class	Classroom Dimensions	Effects of classroom dimension (Gifford, 2002), effects of size of classroom (Black, 2007),	Achievable in a small classroom (Xi et al., 2017), small size for the peer to peer learning (Callahan, 2004),	Achievable in a small classroom (Xi et al., 2017),	Achievable in a small classroom (Xi et al., 2017),
	Physical Quality	Effects of the light, ventilation, and noise (Barrett etal., 2013; Cheryan et al., 2014), temperature effects (Dunn & Dunn, 1979), lighting effects (Wilkerson et	An old style (Yang et al., 2013),	An old style (Yang et al., 2013),	An old style (Yang et al., 2013),

		al., 2015), traditional style (Yang et al., 2013),			
	Furniture	Effects of furniture on performance (Doctoroff, 2001), more marks with better furniture (Kaya & Burgess, 2007), less flexible (Bicard et al., 2012),	Less flexible (Bicard et al., 2012)	Effective aspects of the classroom arrangement (Cinar, 2010), less flexible (Bicard et al., 2012)	less flexible (Bicard et al., 2012)
Psychosocial Aspects	Psychosocial	Social and cultural backgrounds (Haghighi & Jusan, 2012), social interaction (Gest & Rodkin, 2011), formal education (Wannarka & Ruhl, 2008), top-down authority (Salkind, 2008)	Peer to peer learning (Callahan, 2004; Gump, 1987),		For discussion, cooperation, and interaction (Bonus & Riordan, 1998; Kregenow et al., 2011),
	Personality and behavior	Effects of personality on seating selection (Parker et al., 2011), adapted with text exam (Bonus & Riordan, 1998), to reduce inappropriate behavior (Fernandes et al., 2011; Wannaka & Ruhl, 2008), personalization of classroom (Bakare, 2012; Kaya & Burgess, 2007),	Increase linking (Burke & Sass, 2013), increasing the positive personality, (Burke & Sass, 2013), decreasing of aggregative acts (Van den Berg & Cillessen, 2015),	Social interaction (Kregenow et al., 2011), strengthen relationship (Van den Berg & Cillessen, 2015),	Free selection (Vander Schee, 2011), asking more question (Marx et al., 2000), free circulation (Tanner, 2009),
Class Achievement	Class Environment	Interaction between lecturer and students (Dunn & Dunn, 1979), better monitoring of students (Fernandes et al., 2011), classical style McKeown et al., 2015) , a formal system of education (Wannarka & Ruhl, 2008),	Peer to peer learning (Callahan, 2004),		Better view of students (Vander Schee, 2011), students-oriented paradigm (Gremmen et al., 2016), high interaction (Fernandes et al., 2011) , increasing relationships (Van den Berg & Cillessen, 2015),
	Performance	Asking question (Marx et al., 2000), better performance in seating front (Ayikwei, 2016), to create interactive, participator, and isolated students (Kaya & Burgess, 2007), active zone (Bandura, 1986),	To solve isolated problems (Burke & Sass, 2013),		Asking question (Marx et al., 2000) , better performance (Xi et al., 2017), positive effects of free space for activities on performance (Eugene & Melaine, 2013)

To continue the interpretation of studies, table 2 summarized the positive and negative results, achievement, and assumption about the seating arrangement among of scholar as the following part.

Table 2. *Opinions on the opportunities and constraints of the seating arrangement forms*

No	Style of seating	The concept of the arrangement	Opportunities	Constraints
1	Raw-column		Individualism among students (Wannarka & Ruhl, 2008), attention to the instructor, reducing the social interaction (Weinstein, 1992), for exam (Bonus & Riordan, 1998), increasing on-task behavior (Fernandes et al., 2011; Simmons et al., 2015; Wannarka & Ruhl, 2008), to support independent production (Wannarka & Ruhl, 2008), for different purposes (Hue & Shing, 2008), independent works and on task behavior	Limited numbers of questions (Bakare, 2012), to be passive learner (Salkind, 2008), to increase off-task behavior (Rosenfield et al., 1985), classical style (McKeown et al., 2015), subject oriented (Gremmen et al., 2016), increase the top-

			(Wheldoll & Brodd, 2010), adapted with text exam (Bonus & Riordan, 1998), to reduce inappropriate behavior (Fernandes et al., 2011; Wannarka & Ruhl, 2008), a formal system of education (Wannarka & Ruhl, 2008),	down authorities (Salkind, 2008), less opportunities for rear positions (Fernandes & Huang, 2012), less seats in the front (Kaya & Burgess, 2007), An old style (Yang et al., 2013),
2	Joined		Teamwork and peer to peer learning (Callahan, 2004; Gump, 1987; Steinzor, 1950), increasing the positive personality, (Burke & Sass, 2013), decreasing of aggregative acts (Van den Berg & Cillessen, 2015),	An old style (Yang et al., 2013), Achievable in a small classroom (Xi et al., 2017), small size for the peer to peer learning (Callahan, 2004),
3	Cluster		Fitted for discussion and collaboration (Rosenfield et al., 1985), social interaction (Marx et al., 2000),	Reduce control by teacher (Marx et al., 2000), An old style (Yang et al., 2013),
4	U-shape		More effective on the learning (Wannarka & Ruhl, 2008), social interaction (Haghighi & Jusan, 2012), easy access to students, face to face connection, territorial space (Altman & Chemers, 1984), engaging more with students (Rosenfield et al., 1985), eye contact (Simmons et al., 2015), more asking questions (Marx et al., 2000), better performance (Xi et al., 2017), better view (Vander Schee, 2011), students oriented (Gremmen et al., 2016), increasing the relationships (Van den Berg & Cillessen, 2015)	Limitation of number of participants (Hilal, 2014), dead spaces, increasing the distractive behaviors (Wasnock, 2010), An old style (Yang et al., 2013),
5	Free of order		Varieties of selection and options (Vander Schee, 2011), flexible (Bicard et al., 2012), free circulation (Tanner, 2009),	No observed

METHODS and MATERIALS
RESULTS

The Median of the data demonstrated that generally, the students agreed with the questions except questions 5 and 11, which presented the students did not like to work lonely or be passive in the studios. The analysis showed that the students were strongly agreed with four topics including 'to have permanent seat, to personalize the location, sitting close to lecturers, and believe in the teamwork activities' (Table 3).

Table 3. *General tendency in answer of the respondents*

No	***Hypothesized questions based on the Likert scale measurement***	***Mode***	***Meaning***
1	I prefer to take place in a permanent seat in the studio than changing every times	4	Strongly Agree
2	I like to personalize my location with some arrangements of equipment or decoration	4	Strongly Agree
3	I believe that my seat position in the studio has influences my creativity and productivity	3	Agree
4	When I sit close to the lecturer I can understand better the course	4	Strongly Agree
5	I prefer to work lonely than in group	2	Disagree
6	I prefer to be leader in the team working	3	Agree
7	I believe the team can support me in process of production	4	Strongly Agree
8	My design and productions are best in the studio	3	Agree
9	Normally I explain some higher ideas in the studio others cannot understand easily	3	Agree
10	I believe that I desire better position than I have	3	Agree
11	I prefer to listen to discussion in the studio than participation	2	Disagree

12	I pay more attention to my thoughts than what other tell in the studio	3	Agree
13	Sitting close to my friends in the main reason of my seat position in studio	3	Agree
14	I often ask question or open discussion with lecturers in the studio	3	Agree
15	Sometimes I feel that the idea was explained by other students was exactly what I thought; however, I could not express myself	3	Agree

Results of the graphical questions demonstrated that students have been interested in the U-shaped for both classroom and studio as a general tendency (Table 4). According to the results, the U-shaped studio arrangement was the more preferable style for the seating among students than others were such as raw, joined and free of order.

Table 4. *General Tendency to select the form of classroom and studio*

The Form	Classroom	Studio	Total	Percent
Raw-Column	11	3	14	7 %
Joined	24	9	33	16.5 %
U-shape	64	72	136	67 %
Free of order	3	16	19	9.5 %
Total	102	100	202	100

To discover the correlation between the viewpoint of students and seating arrangement, the chi-square analysis was applied to test the hypothesis of the research, if there was any association between the viewpoint of students and the seating arrangement preferences. Table 5 demonstrated the chi-square test results based on the P-Value in crosschecking the viewpoint of the students and form of the seating arrangement based on the raw and U-shaped in both studio and classroom respectively.

Table 5. *Chi-square analysis*

No	Question factors	P value for the studio			P value for the classroom		
		Selection	Raw	U	Selection	Raw	U
1	I prefer to permanent seat position	.070	.372	.184	.070	.226	.531
2	I like to personalize my seat location	.095	.540	.001	.255	.826	.042
3	The seating position effect to my productivity	.777	.263	.113	.750	.892	.877
4	I like to seat close to lectures position	.765	.499	.001	.742	.017	.033
5	I prefer to work lonely	.223	.184	.415	.420	.228	.661
6	I prefer to be leader in team working	.674	.548	.980	.954	.222	.907
7	I believe team can support me in production	.289	.686	.005	.917	.821	.750
8	I believe I am best in studio production	.374	.283	.317	.193	.489	.458
9	I normally explain Higher ideas in the studio	.115	.761	.395	.397	.062	.386
10	I believe I desire better position than I am	.275	.461	.001	.066	.281	.402
11	I prefer to listen discussion than participate in studio	.341	.480	.565	.874	.765	.395
12	I pay more attention to my thoughts than other discussion	.124	.582	.844	.690	.461	.846
13	I prefer to sit close friends	.089	.227	.686	.823	.665	.141
14	I open discussion with lecturers in the studio	.554	.510	.490	.398	.446	.054
15	some ideas explained what I thought	.664	.834	.780	.597	.181	.593

The results demonstrated that variables were not associated statistically with the form of seating arrangement in the studio and classroom by students except for five items, which were highlighted with the grey color. The excepted items were included questions with number 2) like to personalize the position (.001 for U-shape), 4) prefer to sit close to lecturer position (.001 for U-shape), 7) believe the team can support (.005 for U-shape), and 10) the desire for the better position

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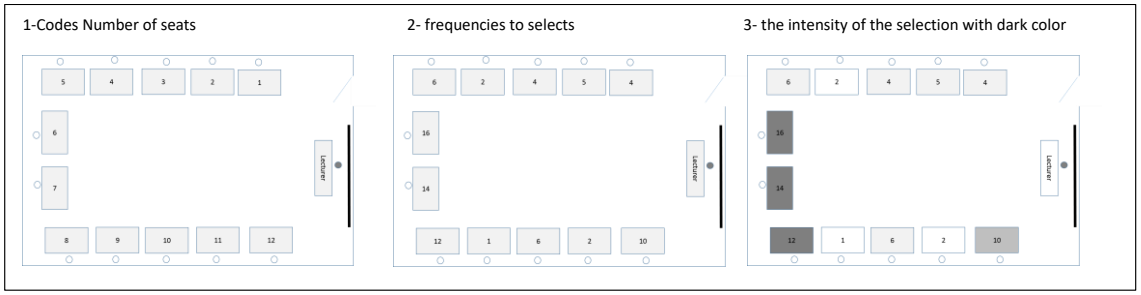
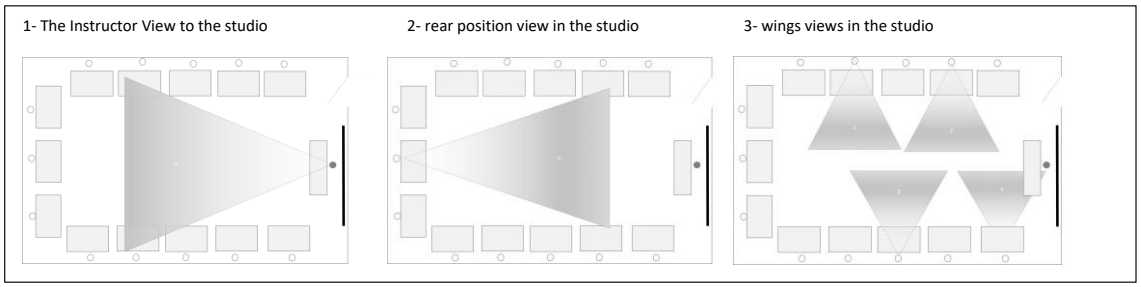
(.001 for U-shape). In detail, the respective p-values were greater than the significance level in those items.

The cross-tabulation analysis identified that totally students selected 78 times U-shaped as preference. In fact, seats number 6, 7, and 8 were selected more by the students; those are located at the rear of the studio. After that, those seats in the edges of the left and right wings were more favorable for the students. Figure 2 illustrates the seat location, frequencies, preferences based on the dark color for more selected to the light color for less selected respectively.



Scheme 2. *Preference of the students to select the seating position in the studios*

Moreover, seemingly, the seats on the rear had a direct view to the instructor of the studio, the door, also view to the other students in the one visual corridor. However, both left and right wings just had a direct view to the opposite panels than whole the studio as figure 3. Therefore, this observability of the studio in the one direction of the view might have influenced the selection of the seat position in the studio.



Scheme 3. *Visual corridors in the design studios*

DISCUSSION

The students had viewpoints about the seating position. The major parts of the questions were not statistically associated with the seating position questions; however, for those questions were associated with the purpose of the research, the evidence confirmed the relationships to support ideas of Parker et al. (2011) and Burke and Sass (2013). In addition, students agreed on a major part of the questions and just they disagreed with the working lonely and the preference to listen that this result also emphasized the high level of social interaction among students in the studios (Kregenow et al., 2011; Tafahomi, 2020; Van den Berg & Cillessen, 2015). Seemingly, the Likert

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style and questionnaire techniques could achieve the target of the research although the level of the profoundness of the answers was limited to the scales (Joshi et al., 2015), similar to the studies Meeks and Xi (Meeks et al., 2013; Xi et al., 2017). Furthermore, the results highlighted that character and personality of the students would have influenced the process of the selection as were mentioned by Bakare (2012), Burke and Sass (2013), and Kaya and Burgess (2007).

The students preferred the U-shaped seating arrangement in both the classroom and studio. This selection showed that the preference of students was more adapted with flexibility than authority. The U-shaped seating arrangement created a short distance between users similar to the joined table form (Callahan, 2004; Tafahomi, 2020). This closeness between the drawings tables allowed the students to take advantage to apply peer to peer learning activities with both sides' students (Burke & Sass, 2013; Van den Berg & Cillessen, 2015). In addition, the students with the selecting of the U-shaped of seating arrangement also confirmed that they preferred an active studio with social interaction (Kuzborska, 2011), positive behaviors (Rosenthal et al., 1985; Wheldoll & Brodd, 2010), and better performance (Xi et al., 2017). Furthermore, this result could refer to the results of Bonus and Riordan (1998), and Kregenow et al. (2011) as a place for discussion, cooperation, and personal and social interaction. This style was mentioned as free selection, asking more questions, and free circulation (Marx et al., 2000; Tanner, 2009; Vander Schee, 2011). According to the results, the students highlighted that the U-shaped could support team working, more attention, and connection with the instructor, freedom to personalize the seating position and enhance the quality of the work in the department. This tendency could support achievements on the positive aspects of the U-shaped classroom in previous studies such as increasing of relationships (Van den Berg & Cillessen, 2015), students oriented (Gremmen et al., 2016), better performance (Xi et al., 2017), and more effective on learning (Wannarka & Ruhl, 2008).

The checking of the cross-tabulation results addressed some seats in the U-shaped studio, which were more selected by the students. Those seats with the drawing table took the position in the rear part of the studio. Therefore, this selection challenges the idea of the seating in front and action zone (Burda & Brooks, 1996; Parker et al., 2011; Perkins & Wieman, 2005; Zomorodian et al., 2012). However, this kind of selection could refer to the trend of personalization, team works, and productivity. This interpretation could be in the same alignment with results of the U-shaped classroom as face-to-face connection and territorial spaces (Altman & Chemers, 1984), engagement more students (Rosenfield et al., 1985), more eye contact (Simmons et al., 2015), and better view (Vander Schee, 2011).

CONCLUSION

The students preferred to use the U-shaped classroom and studio in the department of architecture. Seemingly, they believed that this style of the seating arrangement could support their interests such as the trend to personalize the position, to teamwork activity, to sit close lecturers, to enhance their own position due to the result of the analysis. The results approved the hypothesis of the research in terms of the association between the seating arrangement and viewpoints of the students. The preference of using the U-shaped reveals that the students

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selected a concept in adaptation to the active learning and the student-center approaches in the education. It could demonstrate that students interpreted that U-shaped could more support their possible achievements in the studio, importantly in the teamwork activity, personalization of their position, equality to contact to the instructors, and active manner in the studio.

The U-shaped arrangement creates an open space in the center of the studio that this void could apply for the movement of lecturers, students, and teams of students. This open space made direct access to the tables of the students by instructors for the teaching, desk critiques, and discussion. The U-shaped creates a free space in the front of the drawing table to change the location of the drawing table, archiving the productions, and storing the materials such as papers, woods, and other equipment. In this structure, each drawing table includes a territory for using in front and a backside for personal belonging. Therefore, the arrangement of the studio based on the U-shaped allows the students to personalize the location.

The U-shaped seating arrangement allows the students for eyes contacts and monitoring the activities, which take the place in the design studio. This observation of the peer groups in the studio certainly could positively affect the motivation of students for working, production, and comparison with other students. Other physical activities facilitate peer-to-peer learning such as sketching, physical model making, and presentation board arrangements. Particularly, the monitoring advantage has had a major influence on the selecting of the rear seating location in the studio, the position with longshot view to the whole studio, the studio door, and the position of instructors.

IMPLICATIONS

The research was carried out in the studios with the style of design that the power and internet cables sockets took the places on the surrounding walls. The researcher asked the students to assume availabilities of facilities in all parts of the studio; however, the possible effect of the presupposition of the students to respond to the questions was out of the research although this possibility exists. The students did not include an experience to study in other forms of the studio and get a sense of places. Therefore, in the absence of such experience, the evaluation of the level of the interests in the specific form of the seating arrangement probably needs to other levels of the psychological test about the personality of the students. This research did not attempt to achieve any aspect of the personality specification of the students and other levels of the psychological studies that are required other levels of the research and specialization.

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