The Influence of the Interior Design of the Cafeterias on the Satisfaction Evaluation by the Students

Mehmet SARIKAHYA
Assis. Prof.: Afyon Kocatepe University, Faculty of Fine Arts, 03000 Afyonkarahisar
masarikahya@gmail.com

ABSTRACT
In this paper it is intended to determine whether or not the satisfaction of the university students of internal design of cafeterias which students use in between the classes and during their free time varies depending on some characteristics of the students. For this purpose a survey comprising 22 questions and intended for determining students' satisfaction of the internal design of a university cafeteria has been prepared and administered to 149 students.

Statistically significant differences have been determined ($p < 0.05$) between satisfaction of the students of size of the cafeteria's architecture, layout of the tables and chairs, of service and catering points, design, material, comfort and color of the tables and chairs, illumination level, floor material and color, ceiling material with respect to their genders. Moreover statistically significant differences have also been determined between the satisfactions for some characteristics of the cafeteria depending on the grade, academic program type and differences in the revenues ($p < 0.05$).

In conclusion it has been determined that the gender varies the satisfaction for many design feature and hence is the most significant factor in determining the satisfaction. It is considered that the fact that during design of cafeterias common denominators which cater to the satisfaction of the users and satisfy them the most must be determined and design must be done in conformity with the same shall increase satisfaction of the students of them.

1. INTRODUCTION
Cafeteria is defined as a place where beverages and foods are sold in such places as barracks, factories, schools, etc. and as an eatery which is run by such institutions and wherein only those individuals affiliated by such institutions can eat (TDK, 2019).

School cafeterias are spaces which female and male students need and jointly use throughout their academic lives starting from the primary school. In such spaces female and male students eat and drink together and study and satisfy their social and physical needs. The cafeterias, by their definition, must satisfy needs of their users and of a space which can be used by both genders.

Physical needs are satisfaction of those suitable physical conditions in order for users not to get disturbed during realization of their activities from the environment they are in and ensuring their comfort. Such requirements can be described under such subtopics as spatial, health, physical environmental conditions and security requirements (Korur et al., 2006).

When gender and space are considered together, there rise some questions in our minds with respect to the space as to who, when shall use such spaces and under under what conditions and a foresight forms with respect to colors, furniture and forms to be used depending on the gender. The architectural spaces are differentiated and such spaces as coffee shops (kahvehanes), stadiums and barracks are associated with men and such spaces as women's club, handicraft courses, etc. with women (Günçe, 2018). According

to Yalçınkaya (2015), women are associated with small and introversive spaces and men large and extroversive spaces in life.

The university cafeterias must both satisfy users' needs and be designed to satisfy different genders. When we look at some higher education student satisfaction questionnaires, questions contained in questionnaires of (http://www.selcuk.edu.tr/dosyalar/files/085/OKUL_MEMNUNIYET_ANKETI.pdf,adkg.ankara.edu.tr/dosyalar/OMA.doc,birimler.dpu.edu.tr/app/views/panel/ckfinder/.../Oegrenci_Memnuniyet_Analizi.pdf, https://www.thk.edu.tr/wpcontent/uploads/2019/.../ogrenci_memnuniyet_anketi.pdf) are single option questions such as "decor, design and roominess of the cafeterias are proper", "physical setting of the canteen is proper", "beverages and foods sold at the cafeterias are hygienically appropriate", "physical characteristics are adequate", etc. and no in-depth analysis are contained in such questions.

Garg and Kumar (2017) investigated a conceptual model comprising of different variables such as food and beverage quality and diversity, quality of service, price and value equivalence, ambiance, etc. which have impact on customer satisfaction in catering services of university cafeterias.

Skubina et al. (2019), in their paper, evaluated food area, customer services and cafeteria menus in university cafeterias in Warsaw, Poland.

Chang et al. (2017), in the paper which they did to determine the correlation between food quality, price fairness, personnel performance and ambiance at university cafeterias, suggested that foodquality and price fairness are two dimensions which have an impact on satisfaction of the university students with service quality of cafeterias and that factors of personnel performance and ambiance have no impact on satisfaction of the university students with the university cafeteria.

Norhati and Hafisah (2013) and Hensley and Sulek (2007) determined that physical ambiance have an impact on service quality perception of the customers.

Bitner (1992) developed a new term with respect to physical components of service environment. This space, which he termed as service space, comprises of an optimum combination of temperature, sound levels, furniture and design for influencing the customer satisfaction and ensure a repeatable patronage.

When the above mentioned papers are examined with respect to this topic, we observe that the papers investigate the issue in the context of customer satisfaction and involve such variables as food and beverage quality and diversity, service quality, price and value equivalence, ambient setting, etc.

In this paper it is intended to determine role of gender factor in satisfaction of the students which use the cafeteria, with the cafeteria's fixtures, equipment and decor elements (to the extent they satisfy the requirements). Moreover do satisfaction of those students who use the cafeteria, with the cafeteria, exhibit statistically significant differences by their ages, grades, program types, revenues, frequency of their cafeteria use?

In the event that an answer is found to these questions, one would determine the most important criteria that the students pay attention in decoration of cafeterias and it would be possible to make such designs which the students enjoy and get satisfaction, thereby increasing their academic success level. In this paper, such factors as food and beverage quality and diversity, price and value equivalence, etc. have not been considered but only physical ambiance factors have been considered and satisfaction has been investigated in the context of users' requirements.

2. METHOD

In line with the stated purpose of this paper, a surveycomprising of 22 questions has been prepared using previous researches and literature (Korur et al., 2006, Yalçınkaya, 2015; Sümen and Çağlayan, 2013; Skubina et al., 2019, Garg and Kumar, 2017; Pecotıć et al. (2014), Chang et al. (2014), Norhati and Hafisah, (2013), Hensley and Sulek, (2007)(Selcuk University, 2019). This questionnaire was administered to 149 students who volunteered to participate in the survey, who use the cafeteria and study different fields between March and June 2018 at a cafeteria of a university located in Afyonkarahisar, Turkey. The questionnaire includes questions involving gender, age, grade, income, program type and cafeteria use frequency as well as their satisfaction with the cafeteria and its equipment. In the paper, gender, age, income, program type and cafeteria use frequency have been taken as independent variables. The questions regarding students' satisfaction with the cafeteria and its equipment were taken as dependent variables (Table 1).

Table 1. Dependent variables

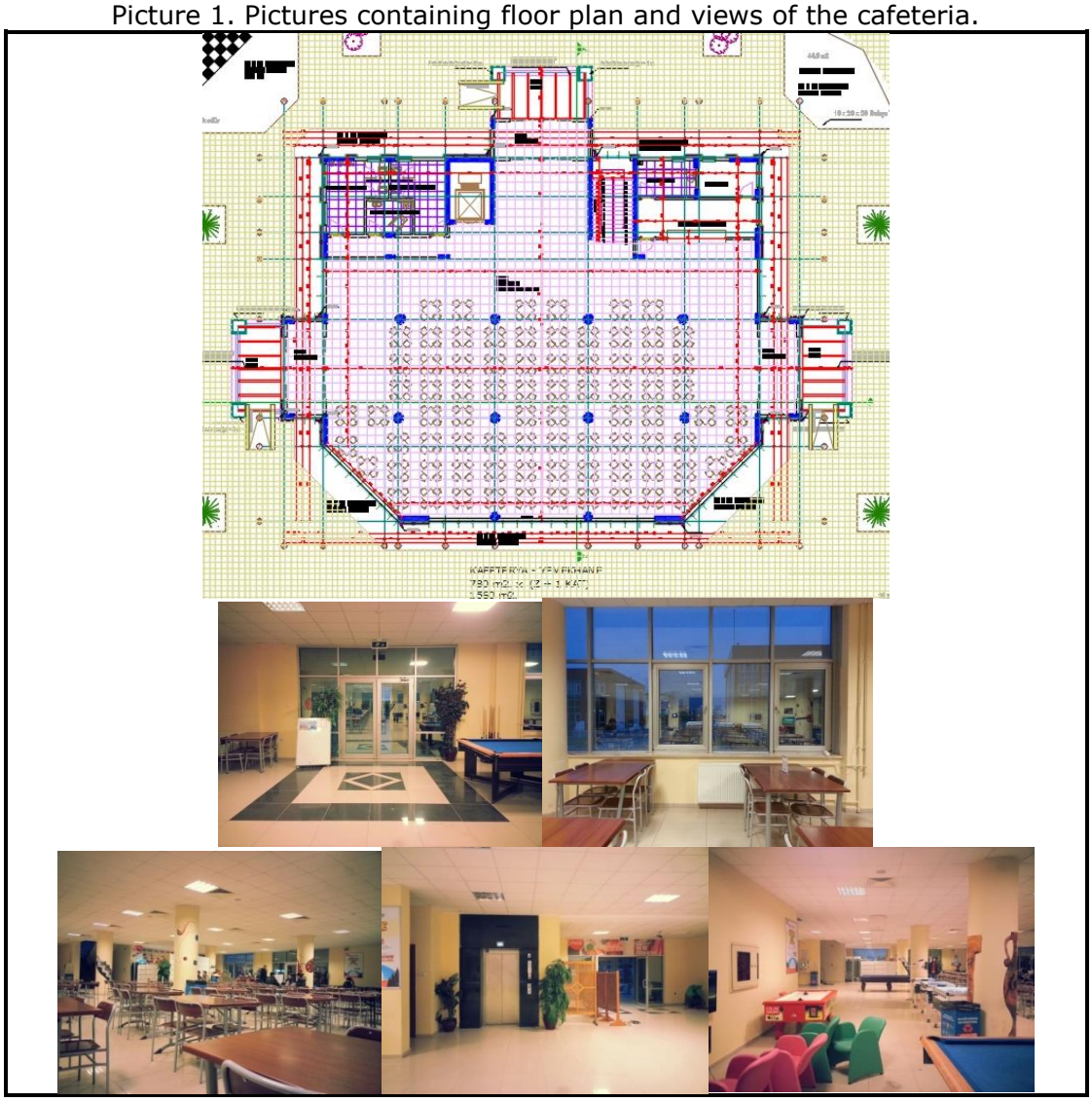
Question no	
1	Are you happy with the architectural size of the cafeteria?
2	Are you satisfied with the layout of tables and chairs and of service and catering points within the cafeteria?
3	Are you happy with wall colors of the cafeteria?
4	Are you satisfied with the design of tables and chairs?
5	Are you satisfied with the material of tables and chairs?
6	Are you satisfied with the comfortability of tables and chairs?
7	Are you satisfied with the color of tables and chairs?
8	Are you happy with illumination level at the cafeteria?
9	Are you happy with sound level at the cafeteria?
10	Are you happy with odor at the cafeteria?
11	Are you happy with ventilation at the cafeteria?
12	Are you happy with flooring material of the cafeteria?
13	Are you happy with flooring color of the cafeteria?
14	Are you happy with ceiling material of the cafeteria?
15	Are you happy with ceiling color of the cafeteria?

The data collected during the paper have been analyzed using trial version of SPSS software package (www.spss.com). Presence of difference between independent variables and dependent variables has been investigated using chi squared test after preparing the crosstabs. Chi squared test in general is used to determine if there is any variance between two ore more independent groups with respect to the analyzed feature and/or any correlation between two qualitative variables (Alpar, 2010). In chi squared test, number of the crosstab cells with a value lower than 5, must not exceed 20% of the total number of crosstab cells. Should total number of crosstab cells with expected values less than 5 exceed 20% of the total number of cells, a suitable row or column combining operation must be carried out (Özdamar, 2004). In this paper Likelihood Ratio (LR) test has been employed and taken into consideration in such cases as having an inadequate number of samples in the cells of crosstabs, number of total crosstab cells with an expected value of less than 5, exceeding total number of crosstab cells and failure to combine rows and columns suitably. Statistical significance level has been taken as $P < 0.05$.

2.1. Description Of The Studied Space

Pictures depicting floor plan and views of the cafeteria where the study was performed, are given in Picture 1.

Picture 1. Pictures containing floor plan and views of the cafeteria.



Some descriptive information about the cafeteria is as follows:

- External envelope of the cafeteria building is composite and silicone applied glass envelope.
- Surface area of the cafeteria is 780 m2. There are three entrances. There is a passage after the door entrance.
- Floor is tiled with 60x 60 cm cream colored ceramic tiles.
- The ceiling is a suspended ceiling with 50x50 cm white colored ceiling tiles. There are ducts within the suspended ceiling.
- The walls are painted cream over the plaster. There are some art paintings over the columns. Garbage cans are placed in front of the columns for hygienic purposes.
- There are gaming sections in the cafeteria, where students can engage in activities.
- The tables and chairs are made of gray colored metal box section material with brown tops; seats and backrests are made up of hard werzalit material.
- While natural illumination is used in general, fluorescent lights are used in the evenings; a dim ambiance is prevalent in general.
- The cafeteria is naturally ventilated by opening the windows.
- The canteen uses a central heating system for heating during wintertime. It employs air conditioning for cooling during summertime.
- Since the cafeteria's acoustics is not good, there is always a din inside.

- When one enters into middle door of the cafeteria, there are male, female and disabled toiled at the right hand side. There is a lift for students with disabilities.

3. FINDINGS

The data involving gender, age, grade, program type, revenue and cafeteria use frequency of the students who participated in the survey, are given in Table 2 below.

Table 2. The data involving gender, age, grade, program type, revenue and cafeteria use frequency of the students

Gender			**Age**		
	f	%		f	%
Female	57	38.3	18-22	93	62.4
Male	92	61.7	23-27	48	32.2
Total	149	100	28 and above	8	5.4
			Total	149	100
Grade			**Program Type**		
	f	%		f	%
1	32	21.5	First (Daytime) Education	127	85.2
2	45	30.2	Second (Evening) Education	22	14.8
3	29	19.5	Total	149	100
4	43	28.9			
Total	149	100			
Monthly revenues of the students			**Cafeteria Use Frequency (Average during weekdays)**		
	f	%		f	%
TL 1-250	13	8.7	1 hour	34	22.8
TL 251-500	44	29.5	2 hours	47	31.5
TL 501 and above	92	61.7	3 hours	29	19.5
Total	149	100	4 hours and more	39	26.2
			Total	149	100

Of the students who participated in the survey, 67.7% is males, 62.4% has an age of 18 - 22, 30.2% is in the second grade, 85.2% is in first education, 61.7% has a monthly allowance of TL 501 and above and 31.5% uses the cafeteria 2 hours per weekdays in average.

Data regarding departments of the students are given in Table 3.

Table 3. Departments of the students.

Departments	f	%
Automotive engineer	22	14.8
Turkish Music vocal education	1	0.7
Cinema - TV	14	9.4
Mechanical engineering	20	13.4
Material science and engineering	18	12.1
Electrical - electronics engineer	16	10.7
Mechatronics	11	7.4
Music Conservatory	9	6.0
Architecture	2	1.3
Internal design	12	8.1
Painting	15	10.1
Music	7	4.7
Performing arts	1	0.7

Physical Education and Sports Faculty	1	0.7
Total	149	100

It is observed in Table 3 that students from various departments participated in the survey.

3.1. Gender Variable

Crosstabs and chi squared test results produced between gender variable and independent variables are given in Table 4.

Table 4. Crosstabs and chi squared test results produced between gender variable and independent variables

		Gender				Total		Chi Squared Test		
		Female		Male						
Independent Variables		**f**	**%**	**f**	**%**	**f**	**%**	X^2	**sd**	**P**
Are you happy with the architectural size of the cafeteria?	Yes	35	61.4	74	80.4	109	73.2	6.491	1	**0.01**
	No	22	38.6	18	19.6	40	26.8			
Are you satisfied with the layout of tables and chairs and of service and catering points within the cafeteria?	Yes	26	45.6	59	64.1	85	57	4.925	1	**0.02**
	No	31	54.4	33	35.9	64	43			
Are you happy with wall colors of the cafeteria?	Yes	24	42.1	58	63	82	55	*6.235*	1	**0.01**
	No	33	57.9	34	37	67	45			
Are you satisfied with the design of tables and chairs?	Yes	16	28.1	48	52.2	64	43	*8.345*	1	**0.00**
	No	41	71.9	44	47.8	85	57			
Are you satisfied with the material of tables and chairs?	Yes	22	38.6	51	55.4	73	49	3.993	1	**0.04**
	No	35	61.4	41	44.6	76	51			
Are you satisfied with the comfortability of tables and chairs?	Yes	9	15.8	36	39.1	45	30.2	9.096	1	**0.00**
	No	48	84.2	56	60.9	104	69.8			
Are you satisfied with the color of tables and chairs?	Yes	21	36.8	61	66.3	82	55	12.34	1	**0.00**
	No	36	63.2	31	33.7	67	45			
Are you happy with illumination level at the cafeteria?	Yes	38	66.7	79	85.9	117	78.5	7.696	1	**0.00**
	No	19	33.3	13	14.1	32	21.5			
Are you happy with sound level at the cafeteria?	Yes	28	49.1	59	64.1	87	58.4	3.263	1	0.07
	No	29	50.9	33	35.9	62	41.6			
Are you happy with odor at the cafeteria?	Yes	23	40.4	48	52.2	71	47.7	1.972	1	0.16
	No	34	59.6	44	47.8	78	52.3			
Are you happy with ventilation at the cafeteria?	Yes	21	36.8	42	45.7	63	42.3	1.119	1	0.29
	No	36	63.2	50	54.3	86	57.7			
Are you happy with flooring material of the cafeteria?	Yes	42	73.7	83	90.2	125	83.9	7.119	1	**0.00**
	No	15	26.3	9	9.8	24	16.1			
Are you happy with flooring color of the cafeteria?	Yes	45	78.9	84	91.3	129	86.6	4.62	1	**0.03**
	No	12	21.1	8	8.7	20	13.4			
Are you happy with ceiling material of the cafeteria?	Yes	44	77.2	86	93.5	130	87.2	8.39	1	**0.00**
	No	13	22.8	6	6.5	19	12.8			
Are you happy with ceiling color of the cafeteria?	Yes	47	82.5	84	91.3	131	87.9	2.594	1	0.10
	No	10	17.5	8	8.7	18	12.1			

Statistically significant differences have been determined ($p < 0.05$) between satisfaction of the students of size of the cafeteria's architecture, layout of the tables and chairs, of service and catering points, design, material, comfort and color of the tables and chairs, illumination level, floor material and color, ceiling material with respect to gender variable.

As per gender variable, no statistically significant could be detected between students' satisfaction with sound level, odor level, ventilation and ceiling color of the cafeteria ($p > 0.05$).

3.2. Grade Variable

Crosstabs and chi squared test results performed between grade variable of the students and their satisfaction with odor level and ventilation within the cafeteria are given in Table 5.

Table 5. Crosstabs and chi squared test results performed between grade variable and satisfaction with odor level and ventilation within the cafeteria

Odor level			Satisfied	Not satisfied	Total	Ventilation			Satisfied	Not satisfied	Total
Grade	1	f	21	11	32	Grade	1	f	18	14	32
		%	65.6	34.4	100			%	56.3	43.8	100
	2	f	25	20	45		2	f	24	21	45
		%	55.6	44.4	100			%	53.3	46.7	100
	3	f	9	20	29		3	f	10	19	29
		%	31	69	100			%	34.5	65.5	100
	4	f	16	27	43		4	f	11	32	43
		%	37.2	62.8	100			%	25.6	74.4	100
Total		f	71	78	149	Total		f	63	86	149
		%	47.7	52.3	100			%	42.3	57.7	100
Pearson Chi Squared Test: 10.361; SD 3; p: 0.016 < 0.05						**Pearson Chi Squared Test: 10.448; SD 3; p: 0.015 < 0.05**					

Accordingly, statistically significant differences have been determined amongst the satisfaction with odor level and ventilation within the cafeteria as per grade variable of the students ($p < 0.05$). No statistically significant difference could be determined between grade variable and other independent variables ($p > 0.05$).

3.3. Program Type Variable

Crosstabs and chi squared test results performed between program type of the students and their satisfaction with illumination level and ceiling material within the cafeteria are given in Table 6.

Table 6. Crosstabs and chi squared test results performed between program type and satisfaction with illumination level and ceiling material within the cafeteria

Illumination level			Satisfied	Not satisfied	Total	Ceiling material			Satisfied	Not satisfied	Total
Program Type	First (Daytime) Education	f	105	22	127	Program Type	First (Daytime) Education	f	114	13	127
		%	82.7	17.3	100			%	89.8	10.2	100
	Second (Evening) Education	f	12	10	22		Second (Evening) Education	f	16	6	22
		%	54.5	45.5	100			%	72.7	27.3	100
Total		f	117	32	149	Total		f	130	19	149
		%	78.5	21.5	100			%	87.2	12.8	100
Pearson Likelihood ratio : 7.618; SD 1; p: 0.006 < 0.05						**Pearson Chi Squared Test: 4.065; SD 1; p: 0.044 < 0.05**					

Accordingly, statistically significant differences have been determined amongst the illumination level and ceiling material of the cafeteria according to program type variable of the students ($p < 0.05$).No statistically significant difference could be determined between program type variable and other independent variables ($p > 0.05$).

3.4. Income Variable

Crosstabs and chi squared test results performed between income variables of the students and their satisfaction with the architectural size of the cafeteria and layout of the tables and chairs as well as of service and catering points, are given in Table 7.

Table 7. Crosstabs and chi squared test results performed between income variables and satisfaction with the architectural size of the cafeteria and layout of the tables and chairs as well as of service and catering points

Architectural size of the cafeteria			Satisfied	Not satisfied	Total	Layout of the tables and chairs as well as of service and catering points			Satisfied	Not satisfied	Total
Income	TL 1-250	f	5	8	13	Income	TL 1-250	f	3	10	13
		%	38.5	61.5	100			%	23.1	76.9	100
	TL 251-500	f	34	10	44		TL 251-500	f	25	19	44
		%	77.3	22.7	100			%	56.8	43.2	100
	TL 501 and above	f	70	22	92		TL 501 and above	f	57	35	92
		%	76.1	23.9	100			%	62	38	100
Total		f	109	40	149	Toplam		f	85	64	149
		%	73.2	26.8	100			%	57	43	100
Pearson Chi Squared Test: 8.750; SD 2; p: 0.013 < 0.05						**Pearson Chi Squared Test: 7.028; SD 2; p: 0.030 < 0.05**					

Accordingly, statistically significant differences have been detected between income variable of the students and their satisfaction with the layout of the tables and chairs and of service and catering points ($p < 0.005$). No statistically significant difference could be determined between income variable and other independent variables ($p > 0.05$).

3.5. Use Frequency and Age Variables

No statistically significant difference could be determined between student satisfactions as per use frequency and age ($p > 0.05$).

4. CONCLUSIONS AND SUGGESTIONS

In this paper which is intended for determining the role of both gender and different independent variables in terms of students' satisfaction with the cafeteria's equipment and decorative elements.

- the architectural size of the cafeteria (780 m^2),
- layout of the tables and chairs as well as of service and catering points
- design, material, comfort and color of the tables and chairs (which are made of gray colored metal box section material with brown tops; seats and backrests are made up of hard werzalit material)
- wall color (cream colored),
- illumination level (naturally illuminated in general and with fluorescent bulbs in the evenings),
- flooring material (60 x 60 cm ceramic tiles),
- flooring color (cream colored),
- and ceiling material (suspension ceiling with 50 x 50 cm white ceiling tiles)

Statistically significant differences have been determined between satisfaction of the male and female users amongst the spatial requirements, as per gender differences ($p < 0.05$).

In addition, the independent variables Class level, program type, income, frequency of use and age variables were determined in detail.

Findings of this paper supports "elements of physical environment affect the satisfaction" as concluded by Norhati and Hafisah (2013) and Hansley and Sulek (2007) but does not concur with "ambiance factors do not affect the students' satisfaction" as suggested by Chang et al. (2014). It is likely to suggest/consider national and regional differences as a reason for such a difference. Assessments by different countries and different cultures might differentiate. According to this paper, the cafeteria's equipment and decoration elements, i.e. ambiance factors, influence the satisfaction of the users.

It is considered that social gender concept as suggested by Yalçınkaya (2015) can be influential as a source for difference between the assessments amongst the male and female students. According to Yalçınkaya (2015), women are more sensitive to current spaces, capable of more problems and bringing suggestions. That's why female students may have evaluated the places they are in more depth and with more sensitivity.

It is also observed that the different evaluations by the female and male students of the cafeterias, exhibit differences in their choices of color. That is to say while in literature the choice of color by the women are such as red, pink, purple, saturated blue, turquoise, choice of color by the men are such as claret, brown, dark green and grayish colors (Özdemir, 2005). The fact that the participating male students are more content with tables and chairs, which are made up of gray metal box section materials with brown tops, can be explained with the choices color by the genders. Moreover in the study by Simpson and Tarrant (1991) there are more detailed names of color used by the women than men; consequently there are more names of colors in color vocabularies of women, than men (Simpson and Tarrant, 1991). This suggestion might also cause the female students to act like this. That's because of the presence of more color names in the vocabulary of female students, might cause them to expect differently. e.g. crimson instead of red or navy blue instead of blue. It can be concluded this observed difference by the gender can make a difference in evaluation of the cafeteria. Given all the foregoing, it can be suggested that colors and tones to be liked by both genders can be used in those cafeterias which are used by both females and males.

According to findings of this paper, statistically significant differences have been determined amongst the satisfaction with odor level and ventilation within the cafeteria as per grade variable of the students. This can be construed as higher the grades are higher the awareness i.e. higher the sensitivity of the students with respect to odor and ventilation. That is to say, when grades of the students increase, they adapted to their settings more, which in turn brought about a more questioning approach for them. However the increased levels of odor inside the cafeteria might stem from the fact that the cafeteria is naturally ventilated.

Statistically significant differences have been determined amongst the illumination level and ceiling material according to program type variable of the students. Since second (evening) education students use the cafeteria during the evening hours and study when it is evening, they benefit from the daylight less. That is why they need more illumination and different ceiling materials; illumination seems more important for them. That's because hours when the second education students study and have exams, are the hours which lack the daylight. It might be suggested that during the design process, more care and importance must be paid to artificial illumination and ceiling material by giving due consideration to requirements of the second education students who use the cafeterias.

Statistically significant differences have been detected between income variable of the students and their satisfaction with the layout of the tables and chairs and of service and catering points. The reason for this is considered to be low income students adapting less to the cafeteria. Moreover it is further considered that physical ambient conditions prevalent in the cafeteria are not adequate for them too and the ambiance does not attract them since they cannot come into and go from the cafeteria nor spend time there. No statistically significant difference could be determined between student satisfactions as per use frequency and age. The reason for that is considered that some students do not spend time in the cafeteria depending on their course schedule even if they have spare time. Some students might be using the cafeteria a lot thanks to friendship and eating despite they do not like it.

When one looks at the age variable, one may encounter students of different age at different grades since some students wins the university exam earlier and some later. Consequently, age variable is not influential in cafeteria use frequency. That is because

the cafeteria use frequency can be dependent on busyness of the course schedule and some personal characteristics. Grade psychology also seems important in using the cafeteria; grade might be more important than the age of the students at the grade.

In conclusion, it is considered that design must be done by giving consideration to common points between both genders; using commonly liked colors shall increase the satisfaction; knowing that the evaluation by the female students are quite different and with lots of detail, shall benefit the design process. Illumination related factors must especially be considered in case of second (evening) education students. It is also considered that ventilating the cafeteria via more advanced means, shall enhance the user satisfaction.

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