Learning Environments Research

Architecture Students' Perception of their Learning Environment and their Academic Performances
--Manuscript Draft--

Abstract:	Scholars have agreed that the way students perceive their learning environment influences their academic performances. Empirical studies that focus on architecture students are however very scarce. This is the gap that an attempt has been made to fill in this study. A questionnaire survey of 273 students in a school of architecture in Nigeria provided data for this pilot study. The perceptions of the students were best defined by the involvement of the students in their studies, their perceived support and conduciveness of the learning environment. The students' perceptions of their learning environment varied with their years of study, ages, and gender. Their perceptions of inflexibility of schedule, positive assessment, and fairness influenced the overall grades of the students. The results suggest the aspects of learning environment that can be manipulated by architectural educators to improve performances of their students. The study of the learning environment of architecture students still appears to be relatively unexplored. The value of this study therefore lies in its exploration of the perceptions of the learning environment from the point of view of students.

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Keywords: Architecture students, learning environment, perception, academic performance

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Introduction

The essence of architecture schools and indeed every department in institutions of learning is to impart relevant skills on their students. The education of architects combines theoretical knowledge and practice within the architectural studio. Teachers of architecture always aim at improving the quality of education given to the students. Researchers have stressed that one of the ways of understanding how students learn as well as their performances is by focusing on the learning environment (Prayoonwong and Nimnuan 2010). The reasons given for this are that educational environment determines the success of curriculum and the effectiveness of learning. Saghafi, Franz, and Crowther (2012) put this more succinctly by noting that the perception of the learning environment, rather than the objective learning environment itself, influence learning. This stance had earlier been taken by McRobbie, Roth and Lucus (1997) who stated that the achievement of students depends on how they perceive their classroom environment as well as the psychosocial interactions which take place there. The environment in this context has often been referred to in the literature as learning environment, which comprises teaching, teaching support, and motivation (Bridgeland, Dilulio and Morison 2006, and Mayya and Roff 2004).

For the architecture student, the studio is the learning space where they spend most of their time receiving instructions and interacting with lecturers and students alike. The architectural studio is a place for multiple interactions, which constitute the learning experience of students. The learning experiences of the students may however go beyond the studio. Similarly, motivation as suggested by previous study (Lueth 2008), may not just be external, rather, it may also be internal. A previous study (Demirba 2001) suggests that the way the students perceive their experiences within the architectural studio may determine the outcome of their studies. In addition, it has been observed that architecture students with more positive outlook about their studies and study environment tend to perform better, however little empirical evidence support this. In addition, it may be interesting investigate if the perceptions of students vary with the year of study and gender. Very few studies exist that investigate the perceptions of this category of students of their learning environment.

The focus of this study is to examine architecture students' perception of their study environment and how these perceptions influence their academic performances. A study of this nature is important to provide teachers of architecture with necessary information on the aspects of the learning environment within their control, which can be manipulated to achieve better results. This study therefore addresses three questions: in what ways do students of architecture perceive their learning environment; do their perceptions vary with gender, age or year of study?; and which dimension(s) of the perceptions differentiate the poor, average and exceptional students in terms of their Cumulative Grade Point Averages (CGPAs)? The present study provides valuable information for architectural education, especially on the ways the perceptions of the students' learning environment influence their academic performances. Findings of this study may inform the review of the setting for the study of architecture and the curriculum.

Literature Review

Students of architecture take a variety of courses varying from history, technology (structure, materials, and building science), to design courses. They are expected to learn, understand and pass these courses to be qualified to practice. According to Hsu (1999) learning is an interactive process and product of student and teacher activity within a specified learning environment. Dochy, Seger, Van Den Bossche and Struyven (2005) observed that learning, in the light of constructivist learning approach, goes beyond transmission of knowledge. Rather, it is a process whereby a student constructs knowledge based on their perceptions, interpretations, and actions. Such constructions of knowledge are often based on their interactions with lecturers, peers, and personal study activities. Specifically, Dochy et al. (2005) noted that it is not the instructional setting itself that matters, rather, the way students interpret their learning environment is an important determinant of their learning outcomes, including their performances (Demirbas 2001). This is probably because those interpretations form the basis for the responses of students. In other words, the ways students approach their studies depend on the way they perceive their learning context, which in turn influence their academic performances.

The learning of architecture takes place mostly in the studio. Lueth (2008) defined the studio as a workspace where students explore a set of skills with or without the presence of an instructor. It is a place where students are listened to, with their ideas clarified and deliberated as they learn how to design. The architectural studio is both a place for instructions as well as for high-level social interaction among students and between students and lecturers (Degregori 2007). Lueth (2008) further noted that the architectural studio is also a place for diverse daily activities of architecture students. The students do not only receive lectures in the studio, but also carry out assignments and studio projects there. The implication of this is that the studio is a place for varying and continual interaction where architecture students spend most of their time (Demirbas 2001). It is within this environment that the students develop meaning of their learning. The learning environment for architecture goes beyond just the studio space and comprises all activities and interaction that promotes teaching and learning within the space. Frenzel, Pekrun, and Goetz (2007) noted that students' perceptions of their learning setting have been associated with many outcomes including their academic grades.

The place of perception of learning environment in learning outcomes has been well researched by Frenzel, Pekrun, and Goetz (2007). Lizzio, Wilson, and Simons (2002) investigated five dimensions of students' perception of the learning environment in a questionnaire they described as Course Experience Questionnaire (CEQ). These dimensions were identified as good teaching, clear goals, assessment, workload, and independence and have been popularly investigated in learning environment perception studies. Very little is however known about architectural students who combine learning of theory and practice within the study environment. As earlier noted, the social aspect of learning is very important in architectural education (Degregori 2007). Njhuis (2006) observed that the CEQ did not pay attention to the social aspect of learning, suggesting that further studies should take into account peer learning. It is obvious that architectural educators may not be able to do much to improve the performances of their students and the overall quality without knowledge of the aspects of the perception of the students that influence their performances. Furthermore, the CEQ suggests that the perception of the learning environment may be related to the space and effectiveness of the teaching process.

The performance of the students is the measure of learning accomplishment. This is often reflected in the grades of the students. A major form of assessment for architecture students is

the design jury. This is often because design is a major course taken by the student, which occupies most of the lecture hours of the students. Anthony (1991) argued that students often see these juries as places for harsh judgment. Students are also often assessed by self-evaluation and peer review as recommended by UIA/ UNESCO (1996). Theoretical courses are assessed by the lecturers based on the course curriculum. Within the university environments, all the grades for courses taken by each student for the semester are often computed as Grade Point Averages (GPA). In the University under study, all scores are based on score out of 100. Scores below 45 attract no point, scores between 45 and 49 = 2 points, 50 to 59= 3 points, 69 to 60= 4 points and scores 70 and above= 5 points. This is aggregated into Cumulative Grade Point Average (CGPA) for all the semesters students have sat for examinations. Students with GPAs lower than 1.5 are categorized failed students, while those with averages 1.5-2.49 are categorized as third class students. Other categories are 2.5 to 3.49 CGPA - second-class lower division, 3.50 to 4.49 - second-class upper division and CGPA that is 4.5 and above - first class. Scholars have suggested that the overall grades of students are influenced by the ways the students perceive their learning environment.

Some empirical studies exist in this area, such as a study by Lizzio, Wilson, and Simons (2002). In their study of 2130 students from 14 faculties at Griffin University, they found no gender differences in the perception of students and their learning environments. They also found positive association between the perception of workload and students Grade Pont Average (GPA). Students who perceived lower workload performed better. One reason given by the authors for this is that such students may be able to manage their workload more effectively than those who perceived that their workloads are too high. In the same study, perceived good teaching also led to better performances of students. In fact, it had the strongest direct influence on the performances of the students

In another study, Mayya and Roff (2004) investigated the perception of the learning environment of Medical students in Kasturba Medical College. The achievers in that study had more positive perceptions of teaching, academic atmosphere and social self than the under-achievers. Social self in this context was how the students perceive their uniqueness and peculiarity within the classroom setting. Gender was also one factor, which was found to influence the ways students perceive their educational environment. Mayya and Roff (2004) found that the male achievers

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were less bored with course than their female achievers. In addition, the male achievers perceived teachers to get less angry. This appears contrary to the findings of Prayoonwong and Nimnuan (2010). In their study of pre-clinical dental students in Naresuan University, although, they did not consider the achievement levels of the students, they found no significant difference between males and females in their perception of their learning environments. Their findings on the other hand indicated that there were significant differences in the perceptions of the students based on their year of study.

Most of the studies on architectural education concentrated on learning styles (Dermibas, 2001; Kvan and Jia 2005). There is however little empirical evidence on the perceptions of architectural students of their learning environment, whether and how this varies with the class or gender of the students and how it affects the academic performances of the students. This study attempted to fill this gap in the literature.

This study hypothesizes that the perception of the learning environment will be influenced by the age, gender and years of study of the students. These attributes of the students are also expected to influence the academic performances of the students in terms of their overall grades. In addition, students' perceptions of their learning environment are also expected to influence their performances.

Research methods

A close-ended questionnaire was developed by the researchers, which incorporated the social aspect of learning. The close-ended questionnaire approach was adopted because it gives uniform basis for comparison of responses. It consisted of three parts. The first part of the questionnaire obtained information on the level of study, gender, and age of students. In the second part, students were asked to indicate the average lecture hours, class size, semester credit load and their Cumulative Grade Point Average (CGPA) after the last examination. The perceptions of the students on their study environment were the focus of the third section of the questionnaire (Table 1). The students were asked to indicate their levels of agreement with questions that bordered on their perceptions of the learning environment in terms of quality of

instructions, academic atmosphere, self, friendship, and student communities. A likert scale of 1-5 was adopted, where one (1) refers to strongly disagree and five (5) for strongly agree. -

The questionnaires were administered by the researchers in a cross-sectional survey of the students of architecture in Covenant University, Ota, Ogun State, Nigeria, in June 2012. The entire student population of 340, which represented students in all levels of the department, was taken as the study sample, however only 273 responded to the questionnaire representing a response rate of 80.2 percent. This is because the population was not high. In addition, all the students were easily accessible as they were all in one location. These students were spread over the four years undergraduate and the two years' postgraduate (masters) levels.

The alpha level was set at 0.05 for all statistical tests. Data were analyzed using Statistical Package for Social Science (SPSS), version 17. The data on respondents profiles were analyzed using descriptive statistics. Principal components analysis was utilized to obtain the main dimensions that describe the students' perceptions of their learning environment. To investigate the variance in students' perceptions according to age, gender and year of study, analysis of variance was carried out. Another analysis carried out in this study was the regression analysis used to determine the demographic and perception factors which influenced the academic performances of the students.

Table 1: Variables for perception of learning environment

Students perception	Variables
perceived quality of instruction	I have access to textbooks which help me learn better
	The nature of my department's curriculum does not give room for students to take courses in other fields
	I can relate with what I am thought in class because they are practical
	I feel I am part of every lecture, so I can help decide how the lecture goes by my contributions
	My lecturers are competent to take their courses
	I can easily ask for clarifications on areas of a lecture I do not understand
	The assignments given by my lecturers help me understand architecture better
	I have a choice in the kind of assignment I get involved in
	I have the lecture notes which greatly help me learn
academic atmosphere	I am satisfied with the size of my class my classroom is organized
	My timetable is adequately spaced to allow me assimilate one lecture before another is taken
	The facilities available in the classroom aid my learning
	other activities often reduce the time
	I have left to spend on my studies
	Some of my lectures are time-wasting
friendship and student communities	Being in class with other students help me learn better
	I help other students with their problem areas in their studies
	I discuss lectures with other students
	I learn a lot from my course mates
	The student body (SAS) gives a good support to my academic pursuit
	I learn from other students' mistakes
student-lecturer interaction	My relationship with my tutors is very cordial
	My lecturers encourage me a lot
	I get good advise form my lecturers
	My lecturers are sometimes unfair
	I relate well with my lecturers
	My lecturers advise on non-academic issues
	My lecturers only assist me when I ask for their assistance
	I interact with my lecturers outside the classroom
	My lecturers do not like me
	My lecturers are excited about the profession
	I am free to express my disagreement with a lecturer's point of view
Assessment	The tests given are always based on lectures already received
	Juries organized in my school are harsh
	Tests are administered at intervals such that it helps my overall performance
	The grading system used by my lecturers is fair
	The quality of teaching and learning in my school can take me through practice for years

Results

A large majority of the respondents in the study were in the second and third years of their study (Table 2). Males aged 17 years and above accounted for majority of the respondents.   The cronbach's alpha test carried out to investigate the reliability of the 50 variables used in measuring the perceptions of the learning environment returned a value of 0.80, which according to George and Mallery (2003) is acceptable

Principal component analysis carried out revealed that twelve (12) factors described the perceptions of the students of their learning environment (Table 3). These factors accounted for 622% of the variance in data. The first factor, which accounted for 13% of the variance, represented the involvement of the students in the study. Accounting for 8% of the variance in the data, the second factor represented the level of perceived support from tutors and other students. The third, fourth and fifth factors represented conduciveness of study environment (6%), comprehensiveness of instruction (5%) and inflexibility of schedule (5%) respectively. Other factors that defined the perception of the students of their study environment are uninspiring tutoring (4%), facilitated learning (4%), positive assessment (4%) and practicability of learning (4%); as well as counsel (3%), fairness (3%) and extended learning setting (3%).

Table 2: Profile of Respondents

		Percentage (%)
Gender	male	67
	female	33
Age of student	14-16	9
	17-19	48
	20-21	26
	above 21	18
Level of study	100 level	19
	200 level	23
	300 level	22
	400 level	18
	MSc I	10
	MSc II	7
Cumulative Grade Point Average (CGPA) last semester	1.5-2.49	3
	2.50-3.49	58
	3.50-4.49	26
	4.50-5.00	12

Source: Field Survey (2012)

Table 3: Factors of Study Environment Perception

Factors (percentage of variance accounted for)	Loaded Variables	Component Score
Factor 1: involvement of students (13%)	I discuss lectures with other students	0.76
	I learn from other students' mistakes	0.75
	Being class with other students help me learn better	0.71
	I learn a lot from my course mates	0.68
	I help other students with their problem areas in their studies	0.66
	I have the lecture notes which greatly help me learn	0.57
	I can easily ask for clarifications areas of a lecture i do not understand	0.54
	My lecturers are excited about the profession	0.53
Factor 2: perceived support (8%)	My relationship with my tutors is very cordial	0.74
	I relate well with my lecturers	0.68
	I feel I am part of every lecture, so i can help decide how the lecture goes by my contribution	0.55
	My lecturers encourage me a lot	0.52
	The student body(SAS) gives a good support to my academic pursuit	0.45
Factor 3: conduciveness of learning environment (6%)	My classroom is organized	0.85
	I am satisfied with the size of my class	0.77
	The class environment aided my learning	0.55
Factor 4: comprehensiveness of instruction (5%)	My department networks with other educational stakeholders outside the school	0.77
	The quality of teaching and learning in my school can take me through practice for years	0.56
	My lecturers advice me with non-academic issues	0.50
Factor 5: inflexibility of schedule (5%)	The nature of my department curriculum does not give room for students to take courses in other fields	0.70
	My lecturers only assist me when I ask	0.52
	Other activities often reduce the time I have left to spend on my studies	0.51
	Juries organized in my school are harsh	0.42
Factor 6: uninspiring tutoring (4%)	My lecturers are sometimes unfair	0.75
	Some of my lectures are time wasting	0.51
	My lecturers do not like me	0.50

Factors (percentage of variance accounted for)	Loaded Variables	Component Score
Factor 7: facilitated learning (4%)	My time table is adequately spaced to allow me assimilate one lecture before another is taken	0.61
	My lecturers are competent to take my courses	-0.54
	The facilities available in classrooms aid my learning	0.43
	I have a choice in the kind of assignment I get involved in	0.42
Factor 8: positive assessment (4%)	The assignments given by my lecturers help me understand architecture better	-0.82
	The grading system used by my lecturer is fair	0.52
Factor 9: practicability (4%)	I can relate with what i am taught in class because they are practical	0.78
	I have access to textbooks which helped me understand my lectures	0.33
Factor 10: counsel (3%)	I get good advice from my lecturers	0.80
Factor 11: fairness (3%)	The text given are always based on lectures already received	0.81
Factor 12: extended learning setting (3%)	I interact with my lecturers outside the classroom	0.72

Source: Field Survey (2012)

Analyses of variance were carried out to determine if the perceptions of the students varied with their year of study, age, and gender. The factor scores on the perception of the learning environment for each of the students were entered as dependent variables in each of the analysis. The mean score for each factor was zero because the factors were standardized during principal component analysis. The F statistics in Table 4 indicated the variances in learning environment perception explained by the year of study, age and gender. When year of study was used as a factor, the F statistics was significant for involvement of students ($F_{(5,263)}= 3.21$, $\eta^2=0.06$, $p= 0.008$), perceived support ($F_{(5,263)}= 2.58$, $\eta^2=0.05$, $p=0.027$), conduciveness of learning environment ($F_{(5,263)}= 16.8$, $\eta^2=0.24$, $p=0.000$), and comprehensiveness of instruction ($F_{(5,263)}= 5.62$, $\eta^2=0.10$, $p=0.000$). Other factors that varied with the year of students were perceptions of inflexibility of schedule ($F_{(5,263)}= 5.16$, $\eta^2=0.09$, $p=0.000$), facilitated learning ($F_{(5,263)}= 6.79$, $\eta^2=0.11$, $p=0.000$) and positive assessment ($F_{(5,263)}= 8.63$, $\eta^2=0.14$, $p=0.000$). The ANOVA effect sizes results suggest that the year of study had medium and large effects ($\eta^2 >0.059$) (Cohen 1988) on all of the perceptions of the learning environment, except the perception of perceived support on which the level of study had small effect. In fact, the year of study had the largest effect on the perception of conduciveness of the learning environment.

The mean and standard deviations are presented in Table 4. As revealed by the mean scores in Table 4, the students perceived highest levels of their involvement in their studies as well as comprehensiveness of instructions during the first year of their studies. There is however, a reduction in perception of these factors in subsequent years. The levels of perceived inflexibility of schedule and positive assessment were also low for the Master Architecture students in the study but high for the undergraduate students. This can be deduced from the results in Table 4 as the mean scores show that the score for inflexibility of schedule was highest for 100 level students (*M*=0.50, *SD*=0.98) but lowest for MSc II students (*M*=0.04, *SD=1.26*). The mean scores for the 100 level students was also highest for 100 In comparison, perceived support, conduciveness of learning environment, and facilitated learning was highest for the Masters classes but lowest for the students in early years of their training. For instance, Table 4 shows that the mean scores of the Masters students on perceived support were *M*= 0.24, *SD*=0.94 and above while those for undergraduates were lower. Similarly, the scores of the masters students on conduciveness of the learning environment were *M*=0.36, *SD*=0.98 and *M*=0.89, *SD*=0.49 for

MSc I and MSc II respectively, while those for undergraduates were lower. Same also goes for facilitated learning.

Perceptions of the students on involvement of the students ($F_{(1.269)}= 5.42$, $\eta^2=0.08$, $p=0.000$), conduciveness of learning environment ($F_{(1.269)}= 4.17$, $\eta^2=0.06$, $p=0.003$), and comprehensiveness of instruction ($F_{(1.269)}= 3.24$, $\eta^2=0.05$, $p=0.013$), varied with the ages of the students. Other learning environment perception factors that varied with the ages of the students were inflexibility of schedule ($F_{(1.269)}= 4.76$, $\eta^2=0.07$, $p=0.001$), facilitated learning ($F_{(1.269)}= 4.71$, $\eta^2=0.07$, $p=0.001$), and positive assessment ($F_{(1.269)}= 2.49$, $\eta^2=0.04$, $p=0.044$). The effect of the age of the students were small for the perceptions of comprehensiveness of instructions and positive assessment, according to Cohen's (1988) rule of thumb ($\eta^2< 0.059$). No large effect of age on perception of learning environment was observed. The results also show that the students between 14 and 16 years old perceived high involvement ($M=0.26$, $SD=0.74$), and positive assessment ($M=0.24$, $SD=0.63$) than older students. The older students (above 21 years) on the other hand indicated higher perceptions of conduciveness of study environment ($M=0.40$, $SD=0.83$) and facilitated learning ($M=0.32$, $SD=0.67$), than younger students. It is however interesting to note that mean score on conduciveness for students aged between 14 and 16 ($M=0.30$, $SD=0.68$) was higher that than of students aged between 17 and 21. The mean score for inflexibility of schedule was highest for students between 20 and 21 years ($M=0.36$, $SD=0.69$) but lowest for students aged between 17 and 19 ($M=-0.19$, $SD=1.04$). It is also interesting to note that the youngest ($M=0.41$, $SD=1.05$), and the oldest ($M=0.32$, $SD=0.71$), categories of students indicated the highest mean scores of the perception of comprehensiveness of instructions.

When gender was entered as a factor, only the perception of comprehensiveness of instruction varied significantly ($F_{(1.269)}= 9.95$, $\eta^2=0.04$, $p=0.002$), although the effect was small. Generally, the male students ($M=0.13$, $SD=0.89$) indicated higher perception of conduciveness of the learning environment than the female students ($M=-0.27$, $SD=1.15$).

Table 4: Mean Differences on Learning Environment Perception Factors by Year of Study, Age and Gender of Students

		involvement of students		perceived support		conduciveness of learning environment		comprehensiveness of instruction		inflexibility of schedule		facilitated learning		positive assessment	
		M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Year of study	100 level	0.31	0.96	0.00	0.76	0.29	0.68	0.55	0.82	0.50	0.98	-0.53	1.41	0.20	0.59
	200 level	0.22	0.88	-0.04	1.02	-0.74	0.91	-0.08	0.86	0.20	0.80	-0.05	0.81	-0.10	0.58
	300 level	-0.32	1.31	-0.20	1.08	-0.20	1.15	-0.29	1.07	0.03	1.07	-0.07	0.76	0.07	0.52
	400 level	0.01	0.68	-0.07	1.15	0.32	0.69	-0.25	1.11	0.39	0.71	0.22	0.98	0.29	0.55
	MSc I	-0.18	0.86	0.57	0.69	0.36	0.98	0.05	1.12	0.04	1.26	0.50	0.68	0.06	0.70
	MSc II	-0.10	0.51	0.24	0.94	0.89	0.49	0.25	0.45	-0.21	1.03	0.58	0.56	-1.24	1.81
	F	3.21		2.58		16.8		5.62		5.16		6.79		8.63	
Age of student	14-16	0.26	0.74			0.30	0.68	0.41	1.05	-0.38	1.17	-0.52	0.79	0.24	0.63
	17-19	0.12	1.05			-0.19	1.04	-0.13	1.01	-0.04	0.97	-0.14	0.78	0.05	0.54
	20-21	-0.10	0.86			0.03	1.02	-0.06	1.07	0.36	0.69	0.24	1.04	0.08	0.62
	above 21	-0.29	0.98			0.40	0.83	0.32	0.71	0.16	1.22	0.32	0.67	-0.41	2.04
	F	5.42				4.17				4.76		4.71		2.49	
Gender of Student	male							0.13	0.89						
	female							-0.27	1.15						
	F							9.95							

All values shown are significant at p<0.005;

Source: Field Survey 201

Another question that was addressed in this study was the dimensions of students' demographic characteristics, and the perception of the study environment, which were most closely associated with the differences observed in the overall grades (CGPA) of the students and the proportion of variance that were explained by the factors. Different Categorical Regression Analyses were thus carried out to establish these relationships. The CGPAs were entered as the dependent variables. The results show that the influence of the ages of the students was significant (b=-0.32, $F_{(1, 271)}$=3.89, p=0.008, accounting for 8 percent of the variance in performance (R^2= 0.08, f^2= 0.08, $F_{(3,273)}$=3.84, p=0.002). A closer look at the data showed that the younger students performed better than older students.

The object scores obtained for the perceptions of the learning environment were also entered as independent variables in the Categorical Regression Analysis. The results show that perceptions of inflexibility of schedule (b=0.16, $F_{(1, 271)}$=3.70, p=0.026), positive assessment (b=-0.24, $F_{(1, 271)}$=5.91, p=0.001), and fairness (b=-0.21, $F_{(1, 271)}$=3.70, p=0.031)were the learning environment perception factors, which influenced the students' academic performances (Table 5). These accounted for 22 percent (R^2= 0.22, f^2= 0.28, $F_{(3,267)}$=1.99 p=0.002) of the variance in academic performances of the students. Specifically, students that indicated low perceptions of inflexibility of schedule recorded poorer performances than those that perceived high inflexibility of schedule. This suggests that the higher the perceptions of flexibility of schedule, the poorer the performances of the students in the study. It is also surprising that the students who indicated high perception of fairness recorded poorer performances than students who lower assessment of fairness. On the contrary, students with high perception of positive assessments recorded better grades than those who perceived assessments that are more negative.

Table 5: Results of Regression Analysis

		standardized beta	Sig.	F	R^2	F	Sig.
Students' demographical characteristics					0.08	3.84	0.002
	year of study	0.10	0.792	0.25			
	gender of student	-0.06	0.452	1.77			
	age of student	-0.32	0.008**	3.89			
Perception of learning environment					0.22	1.84	0.002
	involvement of students	-0.06	0.747	0.29			
	perceived support	-0.08	0.745	0.23			
	conduciveness of learning environment	0.07	0.722	0.33			
	comprehensiveness of instruction	-0.13	0.342	1.12			
	inflexibility of schedule	0.16	0.026*	3.70			
	uninspiring tutoring	-0.17	0.071	2.38			
	facilitated learning	-0.17	0.053	2.59			
	positive assessment	-0.24	0.001*	5.91			
	practicability	0.10	0.576	0.55			
	counsel	0.10	0.480	0.87			
	fairness	0.21	0.031*	2.71			
	extended learning setting	-0.14	0.308	1.21			

$*p<0.05$; $**p<0.01$

Source: Field Survey 2012)

Discussion

The results suggest that perception of learning environment in the setting of architectural education are also related to the space and effectiveness of the teaching process as earlier suggested by Lizzio, Wilson, and Simons (2002). This is because the conduciveness of learning environment factor is related to the space, while all other factors except perceived support appear to be related to the effectiveness of the teaching process. The perceived support will appear to be an additional dimension which probably suggests the peculiarity of the training of architecture. This may be an indication for the need of students to identify or connect with both tutors and the students body in their course of study.

It is also interesting to note that the factor which best defined the perceptions of the students of their learning environment was the involvement of the students. This may suggest a yearning of the students to be involved in their training. It is also probably a fallout of the aim of university education which seeks to make students knowledgeable in their own rights. One may therefore say that the students are not just interested in receiving instructions; they also prefer to be part of the creation of knowledge, which may have implications for architectural education. This is in the light of the fact that this came ahead of even the conduciveness of the learning environment and other factors that represented the effectiveness of the teaching process.

It is not clear why the architecture students in the first year of their studies felt they were more involved and the instructions were more comprehensive than students in other levels were. It is possible that at the first year, the students were still fresh. In addition, many of the courses taken at that level are continuations of their basic learning in secondary school. As a result, they may find it easy to grasp and participate in the classes. From the second year, students of architecture begin to take specialized courses in the field of architecture. Being new to this field may be the reason why they probably felt less involved and perceived the instructions they receive are less comprehensive. This may suggest a need for architectural educators to find more practical and comprehensive ways of passing across new knowledge at all levels of the study of architecture that will motivate the students to be more involved. This is because as earlier noted; learning is not just a transmission of knowledge, but also a construction of knowledge by the individual students.

The Masters Architecture students also indicated higher perceived support from their tutors and students body, facilitated learning, and conduciveness of learning environment than the undergraduates. This probably suggests that the students get more comfortable with their studies as they approach professional degree acquisition. It is also possible that having been part of the department for four to five years, they have adapted to prevailing conditions and may not complain. Personal observation of the students learning spaces however show that the studio for the Masters students appear more ergonomically adequate with provisions for both manual and electronic drafting. The seats also appear to be more comfortable, the studios air-conditioned. In contrast, the undergraduate studios are not air-conditioned, and the seats are less comfortable, according to students. What this suggests is that architecture schools may need to pay more attention to the facilities they provide for their students. Where possible, students may also be carried along in providing such facilities

The fact that the results of the study show that the final years Masters Architecture students indicated the lowest perception of positive assessment is a point to be noted by architectural educators. The reasons for this are not clear and may be a subject for further studies. It is possible that the basis for the measurement of the learning of these students is not clear to them. The students may want to be well informed about the benefits of assignments and the basis for their assessments. Students in earlier years of study may also have come into the department with open minds. They may therefore not have formed their own opinions on assignments as well as grading. The Masters students also recorded the lowest perception of inflexibility of schedule. A look at the architecture curriculum of the school investigated reveal that while undergraduate take between 11 and 13 courses in a semester, the number of courses take by the postgraduate students ranged from 4 to 7. It may hence be expected that the students who take more courses will have tighter schedules. In addition, the University under study is a mission University, which mandates all undergraduate students to attend certain events, where attendance by postgraduate students is not compulsory.

The fact that older students also indicated higher perception of conduciveness of the learning environment, and facilitated learning may be explained by the fact that these older students may be rounding up their architectural education. As such, the explanation given for the year of study above may suffice. By the Nigerian educational standard, the minimum official age to gain

admission into secondary school is 10 years. As such, an average student in the University is expected to have gained admission into the university between 16 and 17 years. As such, at 21, such student may be in the first or second year of the Masters programme. The explanation for the observed low perception of involvement, inflexibility of schedule and positive assessment may also be similar to that given for the year of study.

The results further suggest that only the students' perception of the conduciveness of their learning environments varied by gender, which appear to contradict the findings of Lizzio, Wilson and Simons (2002), and Prayoonwong and Nimnuan (2010) that there is no significant difference between male and female in terms of their perceptions of their learning environment. This result corroborates the findings of Maya and Roff (2004), which found gender differences in learning environment perceptions. However, gender difference was not in terms of boredom as found by Maya and Roff, but in terms of perceptions of conduciveness of the learning environment. This variation may be linked to the physiological differences between male and female. The terms with which the students described the conduciveness of their learning environment includes the sizes, and organization of their classes. There may be need for further studies to investigate appropriate sizes and organizations of architectural studios, as well as gender preferences of students.

The fact that the younger students in the study recorded better overall grades may be because most of the younger students are still in the earlier years of their studies and have not taken as many courses in the department as the older students. One may not conclude that younger students perform better. This is because it may be necessary to compare students in the same level to reach this conclusion. As suggested by Principe (2005), the perceptions of the learning environment influenced the students' academic performances. Specifically, the perceptions of inflexibility of schedule, positive assessment, and fairness significantly influenced the academic performances of the students. It appears that when the architecture students in the study were faced with tight schedules, they obtain better grades than when their schedules were flexible. What this probably suggests is that tight schedules may help the students to maintain focus and come up with better grades. This may need to be further investigated.

One would have expected that students who perceive that their assessments were positive would record better grades. The results however show the contrary. One reason for this may be that students who always believe they deserve better grades may be propelled to work harder and earn better grades, while those students who perceive high positive assessment feel no need to put in extra efforts and thus obtained lower grades in the different courses.

The findings of this study seem to be different from that of Lizzio, Wilson and Simons (2002) as perceived good teaching, which is represented in this study by comprehensiveness of instructions, is not a significant predictor of the academic grades of architecture students in this study. The variance in performance accounted for by perception factors is also lower, as the percentage obtained in this study was 21.5 percent, compared to Lizzio, Wilson and Simons' 28 percent. A reason for this may be that the contexts are different. It may also suggest the peculiarity of architectural education, which needs to be further investigated.

Conclusion

The perception of architecture students of their learning environment had hitherto received little attention in the literature. Findings of this study suggest that the perceptions of architecture students of their learning environment are not just limited to the space and effectiveness of the learning environment as suggested in previous studies, rather the perception of support from tutors and the students' body is a dimension that seems to be a pertinent factor. This aspect may be very important to the study of architecture because of the high-level social interaction that characterizes architectural study. The findings of the study provide empirical evidence for the influence of year of study, age, and gender on perception of architecture students' learning environment. This study identifies the aspects of perception of the learning environment, which architectural educators and proprietors can use in improving the performances of their students. More inflexible schedules and stringent assessments may appear unfair, but these are avenues for architectural educators to ensure better grades for their students. There is however need to further investigate this in other architecture schools.

There are certain limitations to this study. Firstly, samples were taken from only one architectural school in Nigeria. Although, this may provide a uniform setting for all students, the findings may not be generalized as the contexts in other architectural schools may differ. A wider study may be required to reach such generalization. Secondly, the cross-sectional nature of the study did not permit the investigation of cause-effect relationship. It would be interesting to investigate how the perceptions of individual students of their learning environment will change when their grades change.

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Table I: Variables for perception of learning environment

students perception	
perceived quality of instruction	I have access to textbooks which help me learn better
	The nature of my department's curriculum does not give room for students to take courses in other fields
	I can relate with what I am thought in class because they are practical
	I feel I am part of every lecture, so I can help decide how the lecture goes by my contributions
	My lecturers are competent to take their courses
	I can easily ask for clarifications on areas of a lecture I do not understand
	The assignments given by my lecturers help me understand architecture better
	I have a choice in the kind of assignment I get involved in
	I have the lecture notes which greatly help me learn
academic atmosphere	I am satisfied with the size of my class my classroom is organized
	My timetable is adequately spaced to allow me assimilate one lecture before another is taken
	The facilities available in the classroom aid my learning
	other activities often reduce the time
	I have left to spend on my studies
	Some of my lectures are time-wasting
friendship and student communities	Being in class with other students help me learn better
	I help other students with their problem areas in their studies
	I discuss lectures with other students
	I learn a lot from my course mates
	The student body (SAS) gives a good support to my academic pursuit
	I learn from other students' mistakes

students perception

student-lecturer interaction	My relationship with my tutors is very cordial
	My lecturers encourage me a lot
	I get good advise form my lecturers
	My lecturers are sometimes unfair
	I relate well with my lecturers
	My lecturers advise on non-academic issues
	My lecturers only assist me when I ask for their assistance
	I interact with my lecturers outside the classroom
	My lecturers do not like me
	My lecturers are excited about the profession
	I am free to express my disagreement with a lecturer's point of view
Assessment	The tests given are always based on lectures already received
	Juries organized in my school are harsh
	Tests are administered at intervals such that it helps my overall performance
	The grading system used by my lecturers is fair
	The quality of teaching and learning in my school can take me through practice for years

Table II: Profile of Respondents

		Percentage (%)
Gender	male	67
	female	33
Age of student	14-16	9
	17-19	48
	20-21	26
	above 21	18
Level of study	100 level	19
	200 level	23
	300 level	22
	400 level	18
	MSc I	10
	MSc II	7
Cumulative Grade Point	1.5-2.49	3
Average (CGPA) last semester	2.50-3.49	58
	3.50-4.49	26
	4.50-5.00	12

Source: Field Survey (2012)

Table III: Factors of Study Environment Perception

Factors (percentage of variance accounted for)	Loaded Variables	Component Score
Factor 1: involvement of students (13%)	I discuss lectures with other students	0.76
	I learn from other students' mistakes	0.75
	Being class with other students help me learn better	0.71
	I learn a lot from my course mates	0.68
	I help other students with their problem areas in their studies	0.66
	I have the lecture notes which greatly help me learn	0.57
	I can easily ask for clarifications areas of a lecture i do not understand	0.54
	My lecturers are excited about the profession	0.53
Factor 2: perceived support (8%)	My relationship with my tutors is very cordial	0.74
	I relate well with my lecturers	0.68
	I feel I am part of every lecture, so i can help decide how the lecture goes by my contribution	0.55
	My lecturers encourage me a lot	0.52
	The student body(SAS) gives a good support to my academic pursuit	0.45
Factor 3: conduciveness of learning environment (6%)	My classroom is organized	0.85
	I am satisfied with the size of my class	0.77
	The class environment aided my learning	0.55
Factor 4: comprehensiveness of instruction (5%)	My department networks with other educational stakeholders outside the school	0.77
	The quality of teaching and learning in my school can take me through practice for years	0.56
	My lecturers advice me with non-academic issues	0.50

Factors (percentage of variance accounted for)	Loaded Variables	Component Score
Factor 5: inflexibility of schedule (5%)	The nature of my department curriculum does not give room for students to take courses in other fields	0.70
	My lecturers only assist me when I ask	0.52
	Other activities often reduce the time I have left to spend on my studies	0.51
	Juries organized in my school are harsh	0.42
Factor 6: uninspiring tutoring (4%)	My lecturers are sometimes unfair	0.75
	Some of my lectures are time wasting	0.51
	My lecturers do not like me	0.50
Factor 7: facilitated learning (4%)	My time table is adequately spaced to allow me assimilate one lecture before another is taken	0.61
	My lecturers are competent to take my courses	-0.54
	The facilities available in classrooms aid my learning	0.43
	I have a choice in the kind of assignment I get involved in	0.42
Factor 8: positive assessment (4%)	The assignments given by my lecturers help me understand architecture better	-0.82
	The grading system used by my lecturer is fair	0.52
Factor 9: practicability (4%)	I can relate with what i am taught in class because they are practical	0.78
	I have access to textbooks which helped me understand my lectures	0.33
Factor 10: counsel (3%)	I get good advice from my lecturers	0.80
Factor 11: fairness (3%)	The text given are always based on lectures already received	0.81

Factors (percentage of variance accounted for)	Loaded Variables	Component Score
Factor 12: extended learning setting (3%)	I interact with my lecturers outside the classroom	0.72

Source: Field Survey (2012)

Table IV: Mean Differences on Learning Environment Perception Factors by Year of Study, Age and Gender of Students

		involvement of students	perceived support	conduciveness of learning environment	comprehensiveness of instruction	inflexibility of schedule	facilitated learning	positive assessment
Year of	100 level	0.31 (0.96)	0.00 (0.76)	0.29 (0.68)	0.55 (0.82)	0.50 (0.98)	-0.53 (1.41)	0.20 (0.59)
study	200 level	0.22 (0.88)	-0.04 (1.02)	-0.74 (0.91)	-0.08 (0.86)	0.20 (0.80)	-0.05 (0.81)	-0.10 (0.58)
	300 level	-0.32 (1.31)	-0.20 (1.08)	-0.20 (1.15)	-0.29 (1.07)	0.03 (1.07)	-0.07 (0.76)	0.07 (0.52)
	400 level	0.01 (0.68)	-0.07 (1.15)	0.32 (0.69)	-0.25 (1.11)	0.39 (0.71)	0.22 (0.98)	0.29 (0.55)
	MSc I	-0.18 (0.86)	0.57 (0.69)	0.36 (0.98)	0.05 (1.12)	0.04 (1.26)	0.50 (0.68)	0.06 (0.70)
	MSc II	-0.10 (0.51)	0.24 (0.94)	0.89 (0.49)	0.25 (0.45)	-0.21 (1.03)	0.58 (0.56)	-1.24 (1.81)
	F	3.21	2.58	16.8	5.62	5.16	6.79	8.63
Age of	14-16	0.26 (0.74)		0.30 (0.68)	0.41(1.05)	-0.38 (1.17)	-0.52 (0.79)	0.24 (0.63)
student	17-19	0.12 (1.05)		-0.19 (1.04)	-0.13(1.01)	-0.04 (0.97)	-0.14 (0.78)	0.05 (0.54)
	20-21	-0.10 (0.86)		0.03 (1.02)	-0.06(1.07)	0.36 (0.69)	0.24 (1.04)	0.08 (0.62)
	above 21	-0.29 (0.98)		0.40 (0.83)	0.32(0.71)	0.16 (1.22)	0.32 (0.67)	-0.41 (2.04)
	F	5.42		4.17		4.76	4.71	2.49
Gender	male				0.13 (0.89)			
of	female				-0.27 (1.15)			
Student	F				9.95			

p<0.005;   *Standard deviation in bracket

Source: Field Survey (2012

Table V: Results of Regression Analysis

		standardized beta	Sig.	F	R^2
Students' demographical characteristics			0.002	3.84	0.08
	year of study	0.10	0.792	0.25	
	gender of student	-0.06	0.452	1.77	
	age of student	-0.32	0.008**	3.89	
Perception of learning environment			0.002	1.84	0.22
	involvement of students	-0.06	0.747	0.29	
	perceived support	-0.08	0.745	0.23	
	conduciveness of learning environment	0.07	0.722	0.33	
	comprehensiveness of instruction	-0.13	0.342	1.12	
	inflexibility of schedule	0.16	0.026*	3.70	
	uninspiring tutoring	-0.17	0.071	2.38	
	facilitated learning	-0.17	0.053	2.59	
	positive assessment	-0.24	0.001*	5.91	
	practicability	0.10	0.576	0.55	
	counsel	0.10	0.480	0.87	
	fairness	0.21	0.031*	2.71	
	extended learning setting	-0.14	0.308	1.21	

*$p<0.05$;   **$p<0.01$

Source: Field Survey (2012)