CLASSROOM ENVIRONMENT AND ACADEMIC ACHIEVEMENT

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Abstract: **The study is aimed to determine the relationship between classroom environment and the academic achievement. The respondents were 55 third year Radiologic Technology students enrolled in Cebu Doctors' University. They were made to rate their classroom environment by answering the Classroom Environment Assessment Tool formulated by the researcher. The final grades of the students in each major course were used to determine the level of academic achievement. The study utilized the descriptive correlational design to determine the relationship between the classroom environment and the academic achievement. It was found out that there was a significant correlation between the physical environment and the students' academic achievement in Computed Tomography Scan. The result showed that as the quality of the physical environment increased, the academic achievement of the student also increased. There was a significant correlation between the emotional climate and the Nuclear Medicine students' academic achievement. The findings suggest that the physical environment slightly influenced the academic achievement of the students in Radiologic Technology.**

Keywords: **academic achievement, classroom environment, physical environment, nonphysical environment, radiologic technology, intellectual climate, emotional climate, social climate.**

I. INTRODUCTION

Classroom is the most important area in school and learning in the classroom requires a good level of concentration, listening, writing and reading (Lyon, 2001) [1]. The classrooms should be evaluated to meet the challenging needs of educations and environmental requirements for health, safety and security (Lyon, 2001) [1]. It should be made attractive and comfortable to facilitate learning in students (Young, 2014) [2].

Classroom environment is composed of four factors namely the physical environment, intellectual climate, social climate and emotional climate (Acero, et al., 2007) [3]. The physical environment is made up of the external elements that influence the learners such as the seating arrangement, ventilation, temperature, classroom size, instructional materials, visual lighting, orderliness and cleanliness. Intellectual climate comprises the provisions for activities that stimulate and develop the critical and creative thinking skills of the students, social climate is the interaction of the elements within the classroom such as the teacher and the students, and emotional climate is the feeling of acceptance by the students within the classroom (Acero, et al., 2007) [3].

Based on Maslow's Hierarchy of Needs, it can be implied that the physical and social factors which mostly comprise the external aspect of the learning environment can be considered as a foundation in attaining other learning needs. It is important to acknowledge the effects of the external environment to the learning abilities of the student so that possible measures might be implemented in the future. For this instance, it is needed to give importance to the physical and psychosocial condition of the classroom. Maslow (1954, as cited in Pervin, 1993) stated that human potential is restricted and inherited by the environment [4].

This study is based on the humanistic theory of learning advanced by Abraham H. Maslow (1954, as cited in Schultz, D. & Schultz, 2005) that the goal of learning is self-actualization [4]. In Maslow's Hierarchy of Needs, the different levels of needs are being arranged from the most fundamental to the top goal. The physiological needs which are necessary for survival are placed at the bottom of the pyramid. Next to the physiological needs is the safety then followed by love and belongingness, self-esteem and lastly, self-actualization. According to Maslow, if the requirements in the lower level in the hierarchy are not met, people cannot advance to the next level and will ultimately fail. In this case, the goal of learning which is "self-actualization" cannot be achieved [4].

Based on the Productivity Model by Walberg (1981, as cited in Amirul, et al., 2013), there are nine elements that impacts affective, behavioral and cognitive learning of the students [5]. These nine elements are classified into three categories[5]. Ability, development and the motivation pertain to the intrinsic factors related to the student [5]. The quantity and the quality of teaching are elements present in the educator [5]. The environment includes the house, classroom, peers and television [5]. These elements mutually affect one another in the learning outcome of the student [5].

In the study of Earthman (2002), the criteria that most impact student achievements are human comfort, indoor air quality, lighting, acoustical control, secondary science laboratories and overcrowding of school buildings [6]. The students in the standard building perform better than students in poor building that has inadequate features of good thermal environment, lighting and acoustics [6]. In his study, it was found out that school building design and features has a measurable influence on students' academic performance [6]. However the study conducted by Picus, Marion, Calvo and Glenn (2005) entitled "Understanding the Relationship Between Student Achievement and the Quality of Educational Facilities: Evidence from Wyoming" implied that facilities does no impact student performance [7]. They found out that there was no discernable relationship between test score and building conditions [7].

The objectives of this study are to determine the quality of the classroom environment of the locale and ascertain the relationship between the classroom environment and the student's academic achievement. With this, the researcher will be able to come up with recommendations for improvement.

The independent variable was the classroom environment which was classified into physical and nonphysical environment. The factors that were investigated under the physical environment are the classroom population size, classroom temperature, cleanliness, noise control, quality of furniture, seating arrangement and visual lighting. The nonphysical environment included the intellectual climate, social climate and emotional climate. The dependent variable of the study was the academic achievement of the third year Radiologic Technology students in Cebu Doctors' University. The intervening variables included the gender, birth rank, student status, teacher factor and family background.

The independent variable was the perceptions of the students about their classroom environment. It was obtained with the use of survey questionnaires. The tool contained the demographic profile of the respondents in which the intervening variables were extracted. The dependent variable was the academic achievement of the students which was measured according to the grades that they obtained in major courses such as Computerized Tomography Scan, Radiologic Pathology, Interventional Radiology, Radiation Therapy, Nuclear Medicine, Quality Assurance and Quality Control and Magnetic Resonance Imaging.

II.   METHODOLOGY

The study utilized descriptive correlational design in determining the relationship between the classroom environment and the achievement of Radiologic Technology students in Cebu Doctors' University. The study obtained the perceptions about the physical environment, intellectual climate, social climate and emotional climate of the classroom. The physical environment included the classroom population size, temperature, cleanliness, noise control, quality of furniture, seating arrangement and visual lighting. The students' perception about their classroom environment was related to their grades that they obtained in their major subjects.

The study was conducted in Cebu Doctors' University involving 55 Radiologic Technology students. Forty-one (41) of them were enrolled in Computerized Tomography Scan, twenty-nine (29) in Radiologic Pathology, thirty-three (33) in Interventional Radiology, forty-five (45) in Radiotherapy, forty-seven (47) in Nuclear Medicine, thirty-six (36) in Quality Assurance and Quality Control and forty (40) in Magnetic Resonance Imaging.

A letter of request to conduct the study was sent to the Dean of Graduate School and to the Dean of College of Allied Medical Sciences. The requests had been approved and the researcher proceeded in the conduction of the study.

The questionnaires entitled "Classroom Environment Assessment Tool" were distributed to the respondents. The tool included their demographic profile and their rating for their teachers in every subject. The data obtained were treated to identify the perceptions of the students about their classroom environment. The grades of students in major subjects were obtained from the College of Allied and Medical Sciences.

Frequency distribution and percentage were used to determine the demographic profile of the respondents. Weighted mean was used for item analysis to determine the quality of the classroom environment, the level of academic achievement and the teacher performance per subject. The Pearson r product-moment correlation was used to treat the relationship between the students' perception of the classroom environment and their academic achievement.

III. RESULTS

Most of the respondents are female. Forty (40) out of Fifty-five (55) respondents are female which is equivalent to seventy-three percent (73%). About twenty-nine percent (29%) of the respondents are first born which is sixteen (16) out of fifty-five (55). Thirty-one percent (31%) are middle born. Most of them are last born which is about thirty-three percent (33%). Only seven percent (7%) of them are the only child. Forty-three (43) out of fifty-five (55) respondents are regular students. Seventy-eight percent (78%) of the respondents are living with their parents.

Table 1: Teacher Performance

Course	Weighted Mean	Scale
Computed Tomography Scan	3.76	Very Good
Radiologic Pathology	3.86	Very Good
Interventional Radiology	3.67	Very Good
Radiotherapy	3.82	Very Good
Nuclear Medicine	3.72	Very Good
Quality Assurance and Quality Control	3.83	Very Good
Magnetic Resonance Imaging	3.98	Very Good

Table 1 presents that majority of the respondents rate their teachers in every subject as "very good". The teacher's performance in Magnetic Resonance has the highest mean with a value of 3.98. The teachers in Interventional Radiology obtained the lowest mean of 3.67 which still belongs to the category of "very good". The difference between the teacher's ratings in Magnetic Resonance Imaging and Computed Tomography Scan is not so wide.

Table 2: The Mean of Physical and Non-physical Environment of the Classroom

Environment	Weighted Mean	Interpretation
Physical Environment	2.75	Good
Nonphysical Environment	3.61	Very Good
Overall Classroom Environment	3.19	Good

Table 2 shows the mean of the physical and nonphysical environment of the classroom as perceived by the respondents. The nonphysical environment as rated by the students is "very good" with a mean of 3.61. It is 0.86 higher than the physical environment. It implies that more aspects in the physical environment need to be improved than the nonphysical environment.

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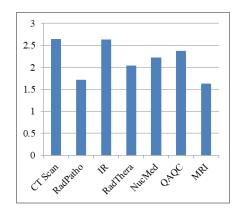Vol. 8, Issue 3, pp: (21-29), Month: May - June 2021, Available at: www.noveltyjournals.com

Figure 1: The Mean of the Students' Academic Achievement in Each Radiologic Technology Major Course

The level of the academic achievement of the third year Radiologic Technology students was identified by obtaining the mean of students' final grades in each major subject. The students' academic level in Computed Tomography Scan, Interventional Radiology, Radiotherapy, Nuclear Medicine and Quality Assurance and Quality Control is "average". The average of the mean in each major subject was used to determine the overall level of academic achievement of the third year Radiologic Technology students.

The mean of the students' final grade is 2.64 (average) in Computed Tomography Scan, 1.72 (above average) in Radiologic Pathology, 2.63 (average) in Interventional Radiology, (average) 2.74 in Radiation Therapy, (average) 2.22 in Nuclear Medicine, (Average) 2.37 in Quality Assurance and Quality Control and 1.63 (above average) in Magnetic Resonance Imaging.

Table 3: Classroom Environment and Academic Achievement

Correlates	Physical Environment		Intellectual Climate		Social Climate		Emotional Climate	
	P Value	Pearson	P Value	Pearson	P value	Pearson	P Value	Pearson
Computed Tomography Scan	0.0505	-0.2968	0.8968	0.0209	0.4140	-0.1311	0.1980	-0.2052
Radiologic Pathology	0.6736	-0.0817	0.7930	0.0509	0.6920	-0.0768	0.2831	-0.2062
Interventional Radiology	0.2897	-0.0589	0.7841	-0.0496	0.4954	-0.0396	0.7449	-0.1900
Radiation Therapy	0.6648	-0.0663	0.4832	0.1072	0.7930	0.0402	0.2836	-0.1633
Nuclear Medicine	0.4743	-0.1070	0.6846	-0.0609	0.4428	-0.1147	0.0416	-0.2984
Quality Assurance and Quality Control	0.7660	-0.0514	0.7809	-0.0480	0.9142	-0.0186	0.2369	-0.2022
Magnetic Resonance Imaging	0.7048	-0.0618	0.9121	0.0180	0.6443	0.0752	0.7189	-0.0588

The Computed Tomography Scan has the highest correlation of physical environment among courses with a p value of 0.0505 which indicates a significant level. It has a correlation value of -0.2968 which indicates a weak to moderate correlation. It means that the physical environment has significantly affected the academic achievement of the students in Computed Tomography Scan.

The correlation of physical environment is -0.0817 in Radiologic Pathology, -0.0589 in Interventional Radiology, -0.0663 in Radiation Therapy, -0.1070 in Nuclear Medicine, -0.0514 in Quality Assurance and Quality Control and -0.0618 in Magnetic Resonance Imaging. This signifies a very weak correlation between the physical environment and the final grades obtained by the students in these subjects.

The correlation of intellectual climate is 0.0209 in Computed Tomography Scan, 0.0509 in Radiologic Pathology, 0.1072 in Radiation Therapy and 0.0180 in Magnetic Resonance Imaging. It signifies a very weak positive correlation. The intellectual climate has a correlation of -0.0496 in Interventional Radiology, -0.0609 in Nuclear Medicine and -0.0480 in Quality Assurance and Quality Control.

The social climate has a correlation of -0.1311 in Computed Tomography Scan, -0.0768 in Radiologic Pathology, -0.0396 in Interventional Radiology, -0.1147 in Nuclear Medicine and -0.0186 in Quality Assurance and Quality Control. The social climate has a correlation of 0.0402 in Radiation Therapy and 0.0752 in Magnetic Resonance Imaging.

The correlation of emotional climate is -0.2052 in Computed Tomography Scan, -0.2062 in Radiologic Pathology, -0.2984 in Nuclear Medicine and -0.2022 in Quality Assurance and Quality Control. This indicates a weak to moderate correlation between the emotional climate and these subjects. Nuclear Medicine has the highest correlation among the courses with a significant level. It has a p value of 0.0416.

IV. DISCUSSION

The result implies that more aspects in the physical environment need to be improved than the nonphysical environment. The rating of the students for the nonphysical environment implies that they are generally happy with the individuals they interact within the classroom. They feel a sense of belongingness and motivated to attend classes and learn. Generally, it means that the students experienced adequate space, temperature, cleanliness, noise control, furniture, seating arrangement and visual lighting.

The space is just enough for the number of students originally intended to occupy the classrooms. The addition of students or guests that will join the class will decrease allotted for each student and might possibly lead to overcrowding. The provisions to control the temperature are well provided. However, its ability to control the humidity within the classroom might not be enough during extreme temperatures such as in summer. Classrooms are generally rated as clean because of the presence of personnel who are tasks to clean the area. Rules for cleanliness have been formulated but they are not visible within the classrooms. Stools, tables and desks are generally in good condition. An alternative is always available when one of these furniture needs to be repaired. The features of the seats and tables are designed to suit its purpose. Sometimes the students are using laboratory seats which might strain their backs during prolonged lectures and discussions. The seating arrangement within the classroom enables them to interact and participate with the class. Most of the time, the traditional seating arrangement is used. The visual lighting is adequate and aids the class in their activities. If one electric bulb is busted, the overall lighting within the classroom is affected. Once the incident has been reported, the class will have to wait for a couple of days for it to be repaired.

Students in Cebu Doctors' University received adequate provisions for conducive learning environment. It also implies that there are aspects for improvement to make the environment outstanding and excellent. White (1972) estimated that seventy-five percent (75%) of learning is accounted for motivation, meaningfulness and memory and the remaining twenty-five percent (25%) is dependent upon the effects of physical environment [8].

The mean of the overall academic achievement of the students implies that the students are doing what needs to be done in order to pass the course. This level of academic achievement implies that students find time to study their lessons. They comply with the assignments and activities for each subject. Generally, they enthusiastically participate in the class discussions. They have a good output in their exercises and perform well in quizzes and examinations. They might find some subject topics difficult to understand but they find ways to learn it such as asking their classmates or teachers. They attend classes regularly and will tend to be anxious if they miss one session. However, average students need to be further motivated so that they can realize their potentials.

The physical environment has significantly affected the academic achievement of the students in Computed Tomography Scan. As the quality of the physical environment increases as perceived by the students, their academic achievement also increases. This indicates that the students should be provided adequate space, a good lighting, acoustic and thermal condition, a good quality of furniture, a seating arrangement that allows easy interaction and a clean environment for learning.

The physical environment is important in Computed Tomography Scan because the students need concentration and focus for this difficult subject. Disturbances due to noise might impede effective communication that is vital for learning. Increased temperature might also cause to decrease the attention span of the students. The academic achievement in Computed Tomography Scan is one of the lowest among the major courses. Clearly, it is affected by the physical environment.

The class size affects the space allocation for each student within the classroom. The study of Finn and Achilles (1999) concluded that the students in small class size achieve higher academic scores compared to students in large class size [9]. Based on the study of Nazari (2014), thirty-five (35) should be the regular number of students in a classroom. Students should be provided adequate space for them to learn [10]. Schneider (2002) stated that the physical condition will affect the mental capacity of the person [11]. Spatial configuration influences the students' and teachers' ability to perform [11].

The thermal condition within the classroom should be at optimum. According to White (1972), excessive temperature and humidity produces perspiration due to heat [8]. The students will be disrupted in listening to the lectures because their body is busy in maintaining homeostasis [8]. According to the study of Puteh, Ahmad, Noh, Adnan and Ibrahim (2015), good temperature with good indoor air quality, ventilation and proper humidity can affect the teaching and learning comfort level [12]. King and Marans (1975, as cited in Schneider, 2002) said that as temperature and humidity increases, student discomfort increases thus reducing their attention span and their ability to perform tasks [11].

The physical environment should be clean and orderly. According to Sandel (2002, as cited in Ortiz, 2004), dirty environment will attract bacteria and promote the growth of molds [13]. This will cause allergies and illnesses among students that might disable them to learn at full mental capacity [13].

There should be sufficient provisions for noise control to minimize class distractions. According to Nazari (2014), the average loudness of teacher's voice in the classroom is fifty-six (56) to seventy (70) decibels [10]. The voice of the teacher should not be overlapped with the background noise [10]. White (1972) stated that the background noise during lecture should be kept to a minimal level so as not to interrupt the lessons [8]. Eberhard (2008) stated that the classroom should be constructed in such a way that it will provide a pleasing acoustic environment [14]. Nelson and Blaeser (2010) stated that only quiet classrooms with low reverberation allow access to effective communication [15]. Based on the study of Heschong (2002), excessive noises, reverberant spaces and thermal discomforts have negative effects in the student learning [16].

The quality and features of the classroom furniture such as desks, seats and tables should be comfortable and convenient to students. It should promote good sitting posture during listening, reading and writing. White (1972) said that providing more flexibility in the classroom furniture facilitates more learning because it provides the individual learner a chance to set things according to his or her own convenience [8].

The seating arrangement within the classroom should facilitate student interaction. According to Koneya (1976, as cited in McCorskey & and McVetta, 1978), the students should be allowed to seat according to their preference [17]. They should not be forced to sit where they do not like otherwise they will be apprehensive [17]. Cinar (2010) said that seating arrangement inside the class has an indirect but important effect on learning [18]. A good arrangement should facilitate good interaction between student and teacher for successful teaching-learning environment [18].

Adequate visual lighting should be provided within the classroom. Based on the study conducted by Heschong (2002), the visual environment in the classroom is important. Sources of glare such as direct penetration to sunlight has a negative impact in student learning [16]. Furthermore, White (1972) stated that adequate lighting should be available to prevent eye strains that might hinder effective student learning [8].

Lyons (2001) stated that the physical environment should provide the students a good level of concentration, listening, writing and reading [1]. The classrooms should be evaluated in order to meet the challenging needs of education [1]. The physical environment of the classroom should not only provide conduciveness to learning but also attractiveness to students. Mohadesi (2002, as cited in Nazari, 2014) said that beauty of the educational setting has an impact in students' motivation [10].

The correlation of intellectual climate is 0.0209 in Computed Tomography Scan, 0.0509 in Radiologic Pathology, 0.1072 in Radiation Therapy and 0.0180 in Magnetic Resonance Imaging. It signifies a very weak positive correlation. It implies that as the teacher provides more activities and examination, the academic achievement of the students decrease. The bulk of activities, assignments, lessons and examinations in Computed Tomography Scan, Radiologic Pathology, Radiation Therapy and Magnetic Resonance Imaging are heavier compared to other major subjects. The lessons of these subjects are somewhat difficult. It implies that as the number of questions that stimulate critical thinking and problem solving skills increases, the academic achievement of the students decreases.

The inverse relationship between the intellectual climate and the academic achievement of the students might be attributed to test anxiety. According to the Spielberger (2010), test anxiety involves greater activation in autonomic nervous system and more self-centered worry that might interfere in performing tasks [19]. Even if the students arrive to class prepared and confident, he will most likely fail because of test anxiety [19]. In addition, Greenberg (2002) stated that students panic during examinations due to unrealistic fear of taking the test that manifest in physiological arousal [20].

As teachers give more activities, examinations, exercises that promote critical and problem solving skills, the students' academic achievement also increases. As stated by Darling-Hammond (2000), the teacher skills play an important role in enriching the intellectual climate within the classroom [21]. The ability of the teacher determines the type of questions that will be formulated during examination [21]. This type of questions will improve the intellectual ability of the students [21]. Based on the study of Busato, Prins, Elshout and Hamaker (2000), intellectual ability and motivation were positively associated with academic success [22].

Good social climate will slightly increase the academic achievement of the students. This means that students should build a good relationship with their classmates through respect. Discrimination against beliefs, religion, culture, sexual orientation and physical appearance should be discouraged. Courtesy should be observed within the classroom. As the classroom promotes a good social environment that fosters respect, the academic achievement of the student increases.

Copa (2008, as cited in California Department of Education, 2008) said that classrooms should be designed in such a way that it promotes collaboration of the students so that they will know the importance of teamwork and communities. Connectivity among students play an important role in learning [23]. Haertel, et al. (1981, as cited in Fraser, 1998) stated that cohesiveness among students within the classroom increases their academic achievement [24].

As the students perceived a better social climate, their academic achievement in these subjects slightly decreases. This might be attributed to the dependency of students to their classmates. It means that in these courses, the students are very comfortable with their classmates to the point that they permit sharing of answers to the activities, exercises and assignments. This will make students dependent and will tend not to work on their own. This will make them miss the opportunity to learn what they are supposed to learn from those activities. As a result of dependency, the academic achievement of the student decreases.

According to Prout and Brown (2007) dependency on others make the students to be more reliant on strong, competent others than strong and competent self [25]. If these dependent students will be left alone to do the task alone such as in examination, they will achieve lower academic achievement [25].

The feeling of positivity of the students slightly increase the academic achievement of the students in Interventional Radiology, Radiation Therapy and Magnetic Resonance Imaging. The feeling of happiness, belongingness and acceptance will increase the students' academic achievement. Belongingness and acceptance increases the students' self-esteem thus making them confident to perform their academic tasks. The classroom should adapt a non-threatening environment that enables the students to express themselves freely.

Dacey and Travers (2002) stated that a good social support will yield a good level of self-esteem [26]. According to Acero, et al. (2007), the learners should be provided with an environment that will make them feel secure [3]. Students should feel accepted by their classmates because the feeling of rejection will alienate them thus diminishing their self-esteem [3].

V. CONCLUSION

Based on the findings, the following statements of conclusions are made: (1) the overall quality of the classroom environment in Cebu Doctors University is good as perceived by the third year Radiologic Technology Students, (2) the overall academic achievement of the third year Radiologic Technology students falls under the category of average, (3) there is a significant relationship between the physical environment of the classroom and the academic achievement of the third year Radiologic Technology students in Computed Tomography Scan, (4) there is a significant relationship between the emotional climate of the classroom and the academic achievement of the third year Radiologic Technology student in Nuclear Medicine, and (5) there is no significant association with the classroom environment and the academic achievement when grouped according to demographic profile.

REFERENCES

[1] Lyons, J. (2001). Do School Facilities Really Impact a Child's Education? An Introduction to the Issues. Retrieved December 7, 2014, from http://sdpl.coe.uga.edu/articlesandpapers/lyons.html

[2] Young, D. (2002), Classroom environment: the basics. Retrieved December 7, 2014, from http://www.learnnc.org/lp/pages/734

[3] Acero, et al. (2007) Principles of Teaching I' 2007 Ed., Retrieved February 29, 2015, From https://books.google.com.ph/books?id=hyDoKmox1LMC&pg=PT17&lpg=PT17&dq=acero+2007+classroom+environment&source=bl&ots=KJkb_n484G&sig=kTrNYMUzqe8VMVVAYJpzMZN518&hl=en&sa=X&ei=JIwCVa2POaXNmwWm54B4&ved=0CCEQ6AEwAA#v=onepage&q=acero%202007%20classroom%20environment&f=false

[4] Pervin, L. (1993) Personality: Theory and Research (6th ed.). New York: John Wiley and Sons

[5] Amirul, N. J., Ahmad, C. N. C., Yahya, A., Abdullah, M. F. N. L., Adnan, M., & Noh, N.M. (2013). The physical classroom learning environment. Retrieved December 4, 2014, from http://www.curtin.edu.my/TL2013/PDF/The%20physical%20classroom%20learning%20environment.pdf

[6] Earthman, G. (2002). School facility conditions and student academic achievement. UCLA's Institute for Democracy, Education, & Access. Retrieved November 20, 2014, from https://escholarship.org/uc/item/5sw56439

[7] Picus, L. O., Marion, S. F., Calvo, N., & Glenn, W. J. (2005). Understanding the relationship between student achievement and the quality of educational facilities: Evidence from Wyoming. Peabody Journal of Education, 80(3), 71-95. Retrieved January 8, 2015, from http://www.tandfonline.com/doi/abs/10.1207/s15327930pje8003_5#.VQIRbfnF8Qk

[8] White, S. (1972) Physical Criteria for Adult Learning Environments. Retrieved December 11, 2014, from http://files.eric.ed.gov/fulltext/ED080882.pdf

[9] Finn, J. D., & Achilles, C. M. (1999). Tennessee's class size study: Findings, implications, misconceptions. Educational Evaluation and Policy Analysis, 21(2), 97-109. Retrieved November 8,2014, from http://epa.sagepub.com/content/21/2/97.short

[10] Nazari, R. (2014). Study on the Effects of Educational Environment (Physical Space and Educational Tools) on Learning and Teaching Mathematics. Mathematics Education Trends and Research, 2014. Retrieved January 7, 2015, from http://www.ispacs.com/journals/metr/2014/metr-00031/article.pdf

[11] Schneider, M. (2002). Do School Facilities Affect Academic Outcomes?: National Clearinghouse for Educational Facilities. Retrieved December 1, 2014, from http://eric.ed.gov/?id=ED470979

[12] Puteh, M., Che Ahmad, C. N., Mohamed Noh, N., Adnan, M., & Ibrahim, M. H. (2015) The Classroom Physical Environment and Its Relation to Teaching and Learning Comfort Level. interpretation, 18, 20. Retrieved December 8, 2014, from http://www.tcrecord.org/Content.asp?ContentId=11680

[13] Ortiz, F. (2004). Essential learning conditions for California youth: Educational facilities. The Teachers College Record, 106(10), 2015-2031. Retrieved December 8, 2014, from http://www.tcrecord.org/Content.asp?ContentId=11680

[14] Eberhard, J. P. (2008). A Place to Learn: How Architecture Affects Hearing and Learning. The ASHA Leader, 13(14), 26-27. Retrieved December 8, 2014, from http://www.asha.org/Publications/leader/2008/081014/081014 g.htm

[15] Nelson, P. & Blaeser, S. (2010). Classroom Acoustics: What Possibly Could Be New?. Retrieved November 27, 2014, from http://www.asha.org/Publications/leader/2010/100921/Classroom-Acoustics.htm

[16] Heschong, L. (2002). Day lighting and student performance. ASHRAE J, 44, 65-67. Retrieved December 8, 2014, from
http://thedaylightsite.oxmond.com/wpcontent/uploads/symposium/DS2007/Daylighting%20and%20Student%20Perf ormance.pdf

[17] McCorskey, J. C., & McVetta, R. W. (1978). Classroom seating arrangements: Instructional communication theory versus student preferences. Communication Education, 27(2), 99-111. Retrieved from December 7, 2014, from http://www.tandfonline.com/doi/abs/10.1080/03634527809378281#.VQIXK_nF8Qk

[18] Cinar, I. (2010) Classroom Geography: Who Sit Where In The Traditional Classrooms?.The Journal of International Social Research 3(10), 200-12. Retrieved December 1, 2014, from sosyalarastirmalar.com/cilt3/sayi10pdf/cinark_ ikram.pdf

[19] Spielberger, C. D. (2010). Test anxiety inventory. John Wiley & Sons, Inc. Retrieved April 1, 2015, from from outcomesdatabase.org

[20] Greenberg, J. (2002) Comprehensive Stress Management (7th Ed.). New York: McGraw-Hill

[21] Darling-Hammond, L. (2010). Quality Teaching: What Is It And How Can It Be measured?. Retrieved February 2, 2015, from https://edpolicy.stanford.edu/sites/default/files/events/materials/ldhscopeteacher-effectiveness.pdf

[22] Busato, V. V., Prins, F. J., Elshout, J. J., & Hamaker, C. (2000). Intellectual ability, learning style, personality, achievement motivation and academic success of psychology students in higher education. Personality and Individual differences, 29(6), 1057-1068. Retrieved April 14, 2015, from http://www.sciencedirect.com/science/ article/pii/S0191886999002536

[23] California Department of Education (2008). Re-Visioning School Facility Planning and Design for the 21st Century: Creating Optimal Learning Environments. Roundtable Proceeding Report Retrieved December 2, 2014, from http://www.cde.ca.gov/ls/fa/sf/documents/roundtablereport.pdf

[24] Fraser, B. J. (1998). Classroom environment instruments: Development, validity and applications. Learning environments research, 1(1), 7-34. Retrieved March 3, 2015, from www.geocities.ws

[25] Prout, T. and Brown, D. (2007), Counseling and Psychotherapy with Children and Adolescents: Theory and Practice for School and Clinical Settings. Retrieved March 3, 215, from https://books.google.com.ph/books?id=Ujw2CyGbpe 8C&pg=PA144&lpg=PA144&dq=social+climate+dependency+on+classmate+cheating&source=bl&ots=VeV5K01f LZ&sig=jAJ7G_6xxDqsivJ4BvKPC5rmw7s&hl=en&sa=X

[26] Dacey, J., & Travers, T. (2002) Human Development Across the Life Span (5th Ed.). Boston: McGraw-Hill Companies Inc.