

Engineering students towards engineering drawing education essay



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The attitude of engineering students towards engineering drawing was studied in this research under students' view of their tutors' teaching style, classroom environment, individual perceptions and characteristics, pre-knowledge of the course and study materials. This questionnaire-based cross sectional survey study of second to fifth year engineering students of the four Departments (Civil, Mechanical, Electrical and Agricultural) in the College of Engineering of Federal University of Agriculture, Abeokuta was conducted in 2012. The result showed that the students have positive attitude towards engineering drawing but for the teaching style of the teachers. It was recommended that teachers of engineering drawing should be interested in the subjects that they teach, be able to emphasis the need of the subject to the students and consider the success of their students important.

Keywords: students, engineering, attitude, drawing

Introduction

Communication skills and good presentation ability are essential for an engineer who aspires to carry out his/her professional practice in the global arena (Riemer, 2002). The ability to exchange ideas, understand others' perspectives, solve problems and successfully utilize the steps and processes presented depends significantly on how effective one is able to communicate with others (Windle and Warren, 1999). Graphical language commonly found among technical professionals for communication of ideas and information from one person to another is engineering drawing (Thomas et. al., 1993). This is used to clearly and concisely communicate all the information necessary to transform an idea or a concept into reality. It

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contains graphic representation of its subject, dimensions, notes and specifications (Taffesse and Kassa, 2005). Engineering graphics design and construction might as well be the most important course of all studies for engineering or technical career. This is so because it is used by designers, technicians, sanitarians and engineers to communicate designs and construction details among the members of these professions. The graphics is written in the form of drawings that represent the shape, size, and specifications of physical objects. It is read by interpreting drawings so that physical objects can be constructed exactly as originally conceived by the designer (Taffesse and Kassa, 2005).

Design model

In design process, working with design model is fundamental concept to the designer. The design model is the replica of the model to be design. This model could be an abstraction that a designer thought out, convey it on paper in sketch and/or note form, carry out some calculations on it, produce detailed formal engineering drawings in 2D/3D view either conventionally or computer aided through to physical prototypes. The designer uses the model of design to record and develop ideas and to provide a basis to evaluate the design (Sharma, 2009). In the case of larger design projects where more than one engineer is involved, design models are utilized to communicate and demonstrate ideas between all those concerned with the product design, development, manufacture and use (Sharma, 2009). These skills are needed by designer generate and work with this model in order to effectively communicate ideas and develop a design (Sharma, 2009). Engineering drawings are used in many different applications. For instance, Surveyors,

civil engineers, sanitarians use engineering drawings to document such works as the layout of a new subdivisions, or the marking of the boundaries for a piece of property. Contractors and construction personnel use technical drawings as their blue prints in converting architectural and engineering designs in to reality (Taffesse and Kassa, 2005).

Attitude

Everyone desires good results from our efforts. Most people are willing to put in their best to achieve the success and happiness they want. Everyone has the capacity to put in ones innate potentials into action to acquire what one desire. But one thing that determines the extent to which one passionately get involved in one's endeavour and maximize one's potential to produce the quality of the result one receive is attitude (Rohn, 2000). Attitude is a mental state that pre-disposes a person to act in a certain way towards the attitude object (Oppenheim, 1992; Sudman, and Bradburn, 1982; Oskamp, 1991).

When students have positive attitude towards a particular subject area they tend to express that by consistently investing more time and effort in that subject area by helping themselves through seeking additional learning opportunities to make up for whatever lapses they may be having (Lindquist, 1980). Studies carried out by Simpson, 1978 and Young, 1998 supposed that positive attitudes towards prescribed learning activities and materials generally facilitate the achievement of the desired learning outcomes.

Researches In education, suggests that student attitudes toward a subject area lead to academic success (Popham, 2005; Royster, Harris, & Schoeps, 1999) People's attitude can be affected by unintentional misinformation provided from a negative sources of influence by voluntary submission

(Rohn, 2000). Everyone influences and is being influenced from time to time. However, one determines the extent of one influenced and to which one is influenced. The factors that have positive strong influence on our attitudes are personality, environment, word expression, affirmation, self image, association, physical appearance (Eromon, 2010). Research carried out by Goodykoontz, 2008 on factors that affect college students' attitude toward mathematics inferred that student attitudes are mostly affected by four external factors: the teacher, teaching style, classroom environment, and assessments and achievement. Additionally, one internal factor that also affect student attitude, is individual perceptions and characteristics.

Generally speaking, engineering drawing is a subject that is often disliked may be due to time involved, back breaking pains as students describe it, tremendous workload, lack of spatial ability, inability to get the precision of dimensions, lack of knowledge of the importance or essence of the course etc. Undergraduate students of Federal University of Agriculture, Abeokuta are not left out of this trend of complain which in turn show in their performances. Relationship between student attitudes and achievement levels, in some particular studies have suggested that achievement levels have a causal influence on student attitudes (Hannula, 2002; Tapia & Marsh, 2001; Lopez, Lent, Brown, & Gore, 1997; Midgley, Feldlaufer, & Eccles, 1989)

Academic attainments in institutions of higher learning can be considered as an outcome of two factors: the first is the individual attributes and the second factor is the systems of education and patterns of imparting knowledge that are organized within schools (Akinleke, 2012). This study

intends to find out the effects of both factors as it relates to engineering students' academic performance in engineering drawing

Materials and Methods

This questionnaire based cross-sectional study of second to fifth year engineering students of Federal University of Agriculture, Abeokuta, Nigeria was conducted in 2012. Second to fifth year engineering students were chosen for the study to ensure that participant has at least completed a section in his/her university education. All the engineering students in the four departments; mechanical, electrical, civil and agricultural engineering of the school were included. The sample covered all the students who were present at the engineering students' conference of the college of engineering. The questionnaire was distributed and collected at the end of the same day. However the students that were absent for any reason during the day of the study were excluded from the study. A total of 200 questionnaires were distributed. The self administered questionnaire assessed information on demography, students' view of their tutors teaching style, classroom environment, individual perceptions and characteristics, pre-knowledge of the course and study materials. Participation in this research was voluntary and no incentive was offered. Informed consent was obtained from participants after being informed about anonymous nature and objective of the study. Data analysis was done using statistical package for social science (SPSS version 16. 0). and test of significance was considered significant was done with chi square statistics. $P < 0. 05$ was considered significant.

Results and discussions

Of the 200 questionnaires distributed, 152 questionnaires out the returned ones were considered appropriate for this study. Incomplete questionnaires were rejected. The 152 returned questionnaires gave an overall retrieval rate of 76%. The retrieval rate for respondents in 200 level was 30. 3% (46), 300 level was 36. 8% (56), 400 level was 14. 5% (22) and 500 level was 18. 5% (28). While Civil, Mechanical, Electrical and Agricultural Engineering Departments are 16. 4%, 27. 6%, 30. 9% and 25. 0% respectively. About nine-tenth (88. 8%) of the respondents are males while remaining (11. 2%) are females (table 1). Majority (97. 4%) of the respondents were in engineering as their choice while 13. 8% out the 97. 4% are not in their area of interest. These results showed that majority of the students liked engineering drawing (75. 7%) while very few students 12. 5% did not like it from the first day the course was taught. More than three-quarters-86. 8% (132/152) did not consider engineering drawing as a difficult subject while 2. 6% (4/152) and 10. 5% (16/152) don't know and do respectively see it as a difficult subject. As the learning progresses 67. 8% still did not develop any hatred for the course while 15. 1% and 17. 1% developed hatred for the course and indecisive about the course respectively (tables 2 and 3). As an engineer, one is trained in engineering drawing to help one transform an idea or a concept in to reality, communicate designs and construction details to others, demonstrate concepts and simplify complex 3-d structures which is a pre-requisite in any stream in the field of engineering. On the question “are you aware that the knowledge of engineering will be relevant to you as an engineer” 145 students representing 95. 4% reported the knowledge of the importance of engineering drawing to them as engineers, while 3 and 4 <https://assignbuster.com/engineering-students-towards-engineering-drawing-education-essay/>

students representing 2% and 2.6% of those who were ignorant and nebulous (tables 2 and 3). Less than half-(44.1%) of the respondents offered technical drawing during their secondary education which is the prelude of engineering drawing ethic. One-fifth (20.4%) of the respondents had information of what the course is all about and 18.4% of the respondents reported being present at the official introduction of the course (table 4). Detailed engineering drawings are produced with the aid of some special instruments and/or equipment. Without the aid of such tools it would have been very difficult for most people to prepare engineering drawings according to the general accepted standards/specifications (Ballegu and Mpagalile). On the question “ Do you have all the instrument needed for the drawing” 77 students representing 50.7% reported being well equipped with the necessary drawing instruments. These instruments were provided by the students themselves 110 (72.4%) (table 4). Good instruments are vehicle in engineering drawing for communication of designs and construction details to others. It is always frustrating when an idea is there but the instrument for conveyance is faulty, malfunctioning or not available. This thwarts a whole lot of drive and idea and possibly hampers the flare for engineering drawing. Learning environment is very crucial in sound teaching and learning process (Kenpro, 2010). A typical classroom should enhance effective learning. This will breed more positive attitudes toward engineering drawing, achieve more and manifest better drafting quality throughout their career as engineers if the learning atmosphere is very conducive. On the question “ Do you have conducive auditorium for classes” 118 students representing 77.6% agreed that their drawing studio is conducive with 63.8% of them acknowledging that they always get space for their drawings boards during drawing classes.

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A total of 130 students representing 85.5% alleged that they are enough seats for everyone member of the class while 11 students representing 7.6% complained that their classroom is crowded (table 5). There are limit of the number of students under the care and control of a teacher which if exceeded will result in deficient and effective training and learning. There may also be severe disciplinary problems, and some students might be threatened. All students should be treated equally in order to archive effective learning in schools (New Arrivals Excellence Program Guide, 2007). About 44 students representing 28.9% of the students complained that the total number of students in a class per class period is too much for a teacher to manage. In creating an effective learning environment (table 5), the tutor should have thorough knowledge of their subjects and should be interested in the subjects that they teach, be able to disclose the necessity for their subjects, and consider the success of their students important (Kenpro, 2010). Teaching students is not always about what is covered per period but how much the knowledge that has been effectively passed on to them.

A picture is worth a thousand words, and sometimes the easiest way to demonstrate something is with an image. This holds true for engineering, with engineering drawings providing an easy to understand graphical illustration of something which has been designed by an engineer. The drawings may represent rough drafts for an object which has not yet been produced, with the drawings being used to explore how the item should be made, and they can also document the process of making or using an item, or simply illustrate how something is supposed to look. The questions that

assessed the view of students on their teachers' teaching method using demonstrative pattern in their teaching revealed that 46 (30.3%) of the students agreed that their teachers are demonstrative in their teaching whereas 25 (16.4%) students hate engineering as a result of poor demonstration. 13 students representing 8.6% of the respondents see engineering as something abstract. On the other hand the students (68.4%) see their teachers as very friendly in the classroom (table 6). This possibly takes the students to class. There is high attendance of students to engineering drawing class as 83.6% of the engineering students reported regular attendance at engineering drawing classes with 25 students representing 16.4% reporting irregular attendance. There is no student who stays away from class trying to study engineering drawing on his/her own. The students do not care about the time the drawing takes, greater number of the class do not see anything wrong with the duration of the engineering drawing class period. About 37.5% and 58.6% of the respondents gets the knowledge first hand from the teachers always and sometimes respectively. Preference for this practice in the always and sometimes categories were reported by 46.7% and 49.3% of the respondents respectively (table 2). The students gave evidence that assignments were usually given by the teachers always at the end of each of the classes with minority (9.2%) reporting regular assignment as being too much. The assessment of the availability of study material showed that there are textbooks available for the personal study among 39.5% of the respondents. A total of 30.9% of the respondents reported being able to apply the basic knowledge passed on to them in the class in other problem and obtain the solution and 40.8% of the respondents reported working more for better personal development (table 7).

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Table 1. Demographic characteristics of the respondents

Table 2. Class attendance and personal opinion across different levels

Table 3. Importance of engineering Drawing

Table 4. Possession of drawing tools

Table 5. Classroom condition

Table 6. Teacher and teaching style

Table 7. Study material and personal development

Conclusion

The attitude of engineering students towards engineering drawing discussed under students' view of their tutors teaching style, classroom environment, individual perceptions and characteristics, pre-knowledge of the course and study materials showed that students have positive attitude towards engineering drawing. The only challenges the students are facing is the teaching style of the teachers. This study has shown that when there is conducive environment, friendly teachers, positive perception and character, good study materials and instruments, the teaching style factor can go a long way to affect the students. The idea of drawing out syllables and covering it at the end of the study year is good but not much more is how many of those things passed on to the students meets the original intent. It is recommended that teachers of engineering drawing should be interested in the subjects that they teach, be able to show the need of the subject to the students and consider the success of their students important.

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