

LEARNING DIFFICULTIES IN BUILDING MEASUREMENT

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Abstract

Building measurement is a course taken by students in construction related programmes. It provides the basic skill required for evaluating the cost of proposed construction work and the calculation of final accounts for work executed. Building measurement is calculation-based and requires great skill in mensuration and a good understanding of design and construction. Competence in building measurement holds great benefits for students and the construction industry at large. Students who have an understanding in the course would likely perform better than those who have difficulties in the course. Furthermore, students who graduate with a proficiency in building measurement would likely be absorbed into the industry to augment existing building economists and replace ageing ones. However, it has been noted that students' generally have learning difficulties with calculation courses. Hence, the study sets out to identify the learning difficulties encountered by students in building measurement. The study adopted a qualitative research design with the use of in-depth semi structured interviews in order to obtain a full understanding of the difficulties encountered by students in building measurement. Twenty five students of building department from a university in Nigeria were interviewed. Data generated from the interview were tape-recorded, transcribed and then analyzed with the use of the NVivo software. The interviews revealed three sources of learning difficulties namely: lecturer, lecture and learning facilities. The interviewees noted that in some cases the teaching style of the lecturer made it difficult for students to comprehend the course. Students desired that lecturers would not assume that they already possess knowledge but rather teach them step-by-step and not rush over the lecture in a bid to cover up the course outline. The interviews further revealed insufficient examples and non-interactive nature of lectures as lecture sources of learning difficulties. Some of the students noted that examples given in class were not illustrative enough which makes comprehension difficult. The students also desired student – centered - learning that would encourage students' participation and increase understanding of the course. Lack of exposure to soft wares and indigenous textbooks on building measurement were identified as the learning facilities sources of learning difficulties. Most of the students reported that the use of soft wares would aid in visualizing and understanding the theories of construction process which is needed for building measurement. The interviewees noted that text books written by indigenous people would further increase understanding of the course. The students pointed out that foreign textbooks emphasis the use of certain building fabric that are not used in Nigeria thereby making comprehension a little difficult. Recommendations for improving students learning in building measurement include: site visits, sufficient examples, reference to indigenous textbooks, interactive teaching sessions and use of 3D drawings and videos. Learning difficulties identified in this study would be operationalized in further studies using quantitative research design with well-structured questionnaire to determine the extent of learning difficulties in building measurement among students of other higher institutions in Nigeria.

Keywords: building, building measurement, learning difficulties, Nigeria, students.

1 INTRODUCTION

Building measurement is a course taken by students in construction related programmes like Quantity Surveying and Architecture. It involves the conversion of building drawings into words and numbers in accordance with a strict set of rules [1]. It provides the basic skill required for evaluating the cost of proposed construction work and the calculation of final accounts for work executed. Quantities from building are usually compiled into bills of quantities which are used to establish an estimate for construction cost and subsequent control of the construction work [2]. Competence in building measurement holds great benefits for students and the construction industry at large. Students who have an understanding in the course would likely perform better than those who have difficulties in the course. Furthermore, students who graduate with a proficiency in building measurement would likely be absorbed into the industry to augment existing building economists and replace ageing ones. However, building measurement is calculation-based and requires great skill in mensuration and a

good understanding of design and construction. Generally, students have challenges in grasping calculation based courses like mathematics, physics and chemistry. In an intermediate mechanics course, [3] observed that some students having difficulty combining physics ideas with mathematical calculations. [4] also provide evidence that reveal that students have trouble interpreting equations in an upper-division chemistry course. Calculation is perceived as difficult for many students because it involves several different components like geometry, symmetry, vector calculus and integrals and task requirement vary with respect to these components [5]. It also deals with a lot of thinking and interpretation of several components [6]. Since building measurement is calculation based, the study sets out to identify the learning difficulties encountered by students in the course.

2 FACTORS AFFECTING STUDENTS' LEARNING

Several factors have been identified as sources of learning difficulties. Many of these factors can also be categorized as factors affecting students' learning and many of them are generic. These factors can be grouped into demographic, teaching strategy, curriculum and learning facilities [7].

Demographic factors include factors of gender, socio-economic status of parents and parents educational level. According to [8] male and female students have different attitudes towards learning. For instance, female students learn mathematics by means of rules and cooperative activities while their male counterparts learn better when they compete with one another. [9] and [10] noted that children with parents that have high economic status perform better academically. Moreover, parents with higher educational level are more likely to encourage their children to pursue higher educational goals [11].

Type of teaching strategy affects students learning. Strategies that enable students to construct their understanding and knowledge of the subject usually enhance their performance [12].

Learning conditions also influence students learning. School climate (Reynolds et al., 1996) and classroom temperature [13] have also been found to affect students' learning.

Curriculum has some effect on students learning. [14] and [15] suggest that curriculum should emphasize more of comprehension and application rather than memorization.

[16] carried out a research on the pedagogical difficulties with building measurement in Quantity Surveying and found the following challenges in order of importance: process of teaching measurement, calculations involved in measurement, insufficient use of technology, rulings in taking off sheet and difficulty in reading drawings.

3 METHODOLOGY

The study adopted a qualitative research design with the use of in-depth semi structured interviews in order to obtain a full understanding of the difficulties encountered by students in building measurement. Twenty five students of building department from a university in Nigeria were interviewed. Data generated from the interview were tape-recorded, transcribed and then analyzed with the use of the NVivo software.

4 FINDINGS

4.1 Do you feel Building Measurement is Relevant to your Profession?

All the students interviewed believe that building measurement is relevant to their profession. Typical responses are:

'Building measurement is important to my profession because it provides the basis for good estimation of building works'.

4.2 What are the Challenges Encountered in the Course Building Measurement?

'My lecturer assumes that we already know. He rarely explains some basic arithmetic formula especially in mensuration'.

'I enjoy my building measurement class except that my lecturer glosses over topics when examination is approaching maybe to cover up the syllabus'.

'I will prefer more interactive and student centered learning'.

'More examples would enhance understanding of the course'.

'In my school classroom size is adequate, there is sufficient ventilation, good lightning, and access to the internet'.

'There are no textbooks written by indigenous authors in my school library. Available textbooks by foreign authors are good but do not showcase some of the building fabrics or methodology used in our construction industry'.

Soft wares would aid in visualizing and understanding the theories of construction process which is a prerequisite to building measurement.

4.3 What do you feel can be done to help Students Perform better in Building Measurement?

'Sufficient examples and practical site visits will enhance students' understanding in the course'.

'I will prefer more interactive teaching sessions'.

'The use of 3D drawings and videos would be helpful'.

5 DISCUSSIONS

The interviews revealed that in some cases the teaching style of the lecturer made it difficult for students to comprehend the course. This resonates well with the findings of Wilson [12] who suggested that teaching strategies that enable students to construct their understanding and knowledge of the subject usually enhances their performance. In particular, teaching speed and lack of thoroughness were identified as lecturer challenges that inhibit students' learning. Students desired that lecturers would not assume that they already possess knowledge but rather teach them step-by-step and not rush over the lecture in a bid to cover up the course outline. The interviews further revealed insufficient examples and non-interactive nature of lectures as lecture sources of learning difficulties. Some of the students noted that examples given in class were not illustrative enough which makes comprehension difficult. The students also desired student – centered - learning that would encourage students' participation and increase understanding of the course. Ostrowski [16] identified the process of teaching building measurement as the most significant pedagogical difficulty in building measurement. Lack of exposure to soft wares and indigenous textbooks on building measurement were identified as the learning facilities sources of learning difficulties. Most of the students reported that the use of soft wares would aid in visualizing and understanding the theories of construction process which is needed for building measurement. This finding is also similar to [16] who identified insufficient use of technology as one of pedagogical difficulty in building measurement. Textbooks enhance learning especially self-directed learning. However, most of the students interviewed revealed that they do not have access to textbooks written by indigenous authors. Even though, textbooks by foreign authors are rich in content and self-explanatory, some of the building fabrics and construction methodology are slightly different from those used in the Nigerian construction industry.

6 RECOMMENDATION AND CONCLUSION

Learning difficulties in building measurement have been identified. Since building measurement holds great benefits for students and the construction industry at large, the study recommends the following to improve students' learning in the course: be regular site visits, use of sufficient examples, reference to indigenous textbooks, interactive teaching sessions, use of 3D drawings and videos.

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