Building Construction Students’ Competence and Cost Control of Resources in Construction Industry

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Abstract

The study sought to determine building construction students’ competence and cost control of resources in construction industry. The study adopted survey design approach. The study was conduction in three state polytechnics in Akwa Ibom, Cross River State, and Delta State. The population of the study is 256 building construction student consisting of 23 females and 233 males. With 85% of the total population a sample size of 218 was obtained using simple random sampling technique. The researcher developed 38-item instruments for data collection. The instruments were tagged Building Construction Students’ Competence Questionnaire (BCSCQ) and Control of Resources in Construction Industry Questionnaire” (CRCIQ). Face validation of the instruments was obtained through the judgment of three specialists, one drawn from the Building Construction Technology Instructor in Akwa Ibom Sate Polytechnic and two from the Department of Vocational Education, University of Uyo, Uyo. The reliability of the instruments was determined using a different population who were not part of the study but possess the same traits of those used in the study. The instrument was tested for reliability using the split-half measurement technique. The lecturers’ instrument (BCSCQ) has the Pearson’s correlation coefficient (r) of the two halves to be 0.78 while the reliability coefficient (R) of (CRCIQ) was computed to be 0.73. The questionnaires were distributed with the aid of trained research assistants to the respondents. Data collected were analyzed using simple linear regression analysis for research questions and for all the null hypotheses. Finding of the study among others revealed that there is a statistically significant prediction of building construction students competence on cost control of resources in construction industry. Based on the findings, it was recommended that polytechnics should ensure that students in building construction courses are trained to be competent in skill related to cost control of building resources as it serves cost and put up the construction company on the pedestrian of high profit making.

Keywords: Building Construction Industry, Students’ Competence, Cost Control of Resources

Background of the Study

The Building Construction Technology Programme at Nigerian Polytechnic offers a comprehensive construction education. Practical training are given to student in estimating building costs, carpentry, cabinet making, building plan reading, brick masonry, construction, building codes and safety among others. As a building construction technology student, it is expected to receive one-on-one instruction from the experienced technology instructors, develop the discipline of teamwork skills, and sense of pride in the work required to excel as a builder.
Students are exposed to every aspect of the construction business including cost control, as hands-on application is stressed as a vital re-enforcement of classroom instruction.

Cost control in construction industry according to Patterson, (2002) entails an efforts construction managers make to monitor, evaluate, and trim expenditures. In Ezeji, and Onoh, (2008b) they viewed that cost control of building in construction industry is generally accepted to mean applying control to a schedule of items, labour, materials, equipment, time, money, plant, tools, raw materials, dividends, development resources, contract execution, payment of salaries to workers in order to obtain an approximation of the cost of construction project and at the same time safe money. From the above views Usoro and Anah (2012) noted the following as the relevance of cost control in construction industry;

1. Cost control determines the probability cost of a building and also relates the cost of the design to the development of the building throughout the projects.
2. It dictates the nature of the most important characteristics of the design, the plan shape, foundation storey height, materials used, type of finishing and so on.
3. It exerts continuous influence on the target cost, as well as guides the execution of the building project.
4. It determines the types of materials that have to be incorporated into the structure.
5. It avoids uneconomical cost distribution at the outset which can result in such permanent waves of unsettlement resulting in project re-design, costly delays and so on.
6. In maintenance, cost control is inescapable as it plays vital role from the selection of the materials, through building to the completion and maintenance level.
7. It ascertains the deviations of actual cost from anticipated costs for all stages of work and this provides important information for the management.
8. It ensures the figures from each cost stage are made available in-order that major deviations of actual cost from the anticipated cost can be appreciated promptly.

According to Covington, (2015) noted that good construction managers focuses upon future revenues, future costs and technical problems. It is expected that building construction students from the Polytechnic should imbibe and be competence in the forecasting mechanism used to assess the project status. Ezeji, & Onoh, (2008a) asserted that Construction managers schedule
the way workers will perform their duty, then they implement procedures to determine whether actual performance complies with these plans schedules.

For control and monitoring purposes, the original detailed cost estimate is typically converted to a project budget, and the project budget is used subsequently as a guide for management. Chanpong, (2009) noted that expenses incurred during the course of a project are recorded in specific job cost accounts to be compared with the original cost estimates in each category. Thus, individual job cost accounts generally represent the basic unit for cost control. Alternatively, Gange, (2005) noted that job cost accounts may be disaggregated or divided into work elements which are related both to particular scheduled activities and to particular cost accounts. For the purpose of project management and control, it is not sufficient to consider only the past record of costs and revenues incurred in a project.

Patterson, (2002) asserted that competencies in control reports are informational reports that tell management about a company's activities. Control reports are only for internal use, and therefore management directs the accounting department to develop tailor-made reporting formats. Accounting provides management with a format designed to detect variations that need investigating. In addition, management also refers to conventional reports such as the income statement and balance sheet, and to external reports on the general economy and the specific industry.

Control reports competencies according to Mitchell (2014) are need to provide an adequate amount of information so that management may determine the reasons for any cost variances from the original budget. A good control report highlights significant information by focusing management's attention on those items in which actual performance significantly differs from the standard. The effective implementation of a cost control and reduction program takes planning and time. It should be seen as a continuous process and one that will need ongoing attention.

Statement of the Problem

This cost control technique has enormous contributions in stimulating and eliciting confidence in the figures that are produced by construction industry. Essential condition of success in a construction industry is to keep constant control on cost over the finance, budgeting,
Many potentially prosperous enterprises die not due to lack of money, but because cost control initiative was neglected. As could be observed the products of building construction in polytechnics who are trained to be managers in the construction site seem not competence on hands-on experience, applying what they’ve learned in the classroom at the building construction site.

Building construction students could not participate in various construction projects including cost control and get experience with a full, start-to-finish residential construction project. It is expected that each day a building construction student should be different based on what he is studying. From blueprints to estimating building costs to carpentry, students seem not properly engaged in all aspects of construction.

During the execution of a project, procedures for project control and record keeping become indispensable tools to construction managers and other participants in the construction process. These tools serve the dual purpose of recording the financial transactions that occur as well as giving managers an indication of the progress and problems associated with a project.

These students are not confident that the skills they develop are useful and highly valued as they cannot turn their goals of satisfying work and financial stability into meaningful action. When employ in the construction industry they could not fill their day with more excitement and a higher sense of accomplishment. From the aforementioned it becomes pertinent to examine building construction students’ competence and cost control of resources in construction industry.

**Purpose of the Study**

The main purpose of the study is to determine building construction students’ competence and cost control of resources in construction industry. Specifically the study sought to:
1. Determine the extent to which competence in scheduling predicts building construction students’ attainment in cost control of building resources in construction industry.

2. Determine the extent to which competence in control report predicts building construction students’ attainment in cost control of building resources in construction industry.

3. Determine the extent to which competence in monitoring predicts building construction students’ attainment in cost control of building resources in construction industry.

4. Determine the extent to which competence in forecasting predicts building construction students’ attainment in cost control of building resources in construction industry.

**Research Questions**

1. to what extent does competence in scheduling predicts building construction students’ attainment in cost control of building resources in construction industry

2. to what extent does competence in control report predicts building construction students’ attainment in cost control of building resources in construction industry.

3. to what extent does competence in monitoring predicts building construction students’ attainment in cost control of building resources in construction industry.

4. to what extent does competence in forecasting predicts building construction students’ attainment in cost control of building resources in construction industry.

**Null hypotheses**

1. Competence in scheduling does not significantly predict building construction students’ attainment in cost control of building resources in construction industry.
2. Competence in control does not significantly predict building construction students’ attainment in cost control of building resources in construction industry.

3. Competence in monitoring does not significantly predict building construction students’ attainment in cost control of building resources in construction industry.

4. Competence in forecasting does not significantly predict building construction students’ attainment in cost control of building resources in construction industry.

Methodology:
The study adopted survey design approach, The study was conduction in three state polytechnics of Akwa Ibom, Cross River State, and Delta States. The population of the study is 256 building construction students consisting of 23 females and 233 males. (Data obtained from the personnel officers, Department of Building Technology). With 85% of the total population a sample size of 218 was obtained using simple random sampling technique. The researchers developed 38-item instruments for data collection. The instruments were tagged Building Construction Students’ Competence Questionnaire (BCSCQ) and Control of Resources in Construction Industry Questionnaire” (CRCIQ). Each of the instruments was divided into sections A and B. Section A inquired for bio-data of the students while Section B was categorized into sub-sections. Each item in Section B of the BCSCQ and CRCIQ has 5 levels of response options of Very High (VH, 5 points), High (H, 4 points), Moderate (M, 3 points), Low (L, 2 points) and Very Low (VL, 1 point) respectively. Face validation of the instruments was obtained through the judgment of three specialists one drawn from the Building Construction instructor in the polytechnique and two from the Department of Vocational Education, University of Uyo, Uyo. The reliability of the instrument was determined using a different population who were not part of the study but possess the same traits of those used in the study. The instrument was tested for reliability using the split-half measurement technique. The internal consistency of the two-halves was determined using Pearson’s Product Moment Correlation coefficient (r) and a reliability coefficient (R) was computed using Spearman-Brown prophesy formula: The instructor’s
Benchmark Journals Instrument (BCSCQ) has the Pearson’s correlation coefficient (r) of the two halves to be 0.78 while the reliability coefficient (R) of (CRCIQ) was computed to be 0.73. The questionnaires were distributed with the aid of trained research assistants to the respondents. The questionnaires were distributed with the aid of trained assistants to the respondents. The total number of 203 questionnaires distributed were completed and returned successfully by the respondents. Fifteen questionnaire was voided. Hence a ninety three percent (93%) response rate was attained. Data collected were analyzed using simple linear regression analysis for research questions and all the null hypotheses.

**Research Question 1:** To what extent does competence in scheduling predicts building construction students’ attainment in cost control of building resources in construction industry?

**Table 1:** Result of R, R square in regression analysis on prediction of competence in scheduling predicts building construction students’ attainment in cost control of building resources in construction industry.

<table>
<thead>
<tr>
<th>Variables</th>
<th>n</th>
<th>R</th>
<th>R square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scheduling competence</td>
<td>203</td>
<td>.634</td>
<td>.690</td>
</tr>
<tr>
<td>Cost control</td>
<td>203</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1 reports the extent to which competence in scheduling predicts building construction students’ attainment in cost control of building resources in construction industry. The analysis revealed a correlation (R) of .634. This value is high and shows a strong and positive prediction. Also the result of the test revealed the coefficient of determination $R^2$ value of .690 meaning 69.0% competence in scheduling predicts students attainment in cost control resources in construction industry.

**Research Question 2:** To what extent does competence in control report predicts building construction students’ attainment in cost control of building resources in construction industry?

**Table 2:** Result of R, R square in regression analysis on prediction of competence in control report predicts building construction students’ attainment in cost control of building resources in construction industry.

<table>
<thead>
<tr>
<th>Variables</th>
<th>n</th>
<th>R</th>
<th>R square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control report</td>
<td>203</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 2 reports the extent to which competence in control report predicts building construction students’ attainment in cost control of building resources in construction industry. The analysis revealed a correlation (R) of .537. This value is high and shows a strong and positive prediction. Also the result of the test revealed the coefficient of determination $R^2$ value of .733 meaning 73.3% competence in control report predicts students attainment in cost control resources in construction industry.

**Research Question 3:** To what extent does competence in monitoring predicts building construction students’ attainment in cost control of building resources in construction industry.

Table 3: Result of R, R square in regression analysis on prediction of competence in monitoring predicts building construction students’ attainment in cost control of building resources in construction industry.

<table>
<thead>
<tr>
<th>Variables</th>
<th>n</th>
<th>R</th>
<th>R square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monitoring competence</td>
<td>203</td>
<td>.776</td>
<td>.602</td>
</tr>
<tr>
<td>Cost control</td>
<td>203</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3 reports the extent to which competence in monitoring predicts building construction students’ attainment in cost control of building resources in construction industry. The analysis revealed a correlation (R) of .776. This value is high and shows a strong and positive prediction. Also the result of the test revealed the coefficient of determination $R^2$ value of .602 meaning 60.2% competence in monitoring predicts students attainment in cost control resources in construction industry.

**Research Question 4:** To what extent does competence in forecasting predicts building construction students’ attainment in cost control of building resources in construction industry in Akwa Ibom State.
Table 3: Result of R, R square in regression analysis on prediction of competence in forecasting predicts building construction students’ attainment in cost control of building resources in construction industry in Akwa Ibom State

<table>
<thead>
<tr>
<th>Variables</th>
<th>n</th>
<th>R</th>
<th>R square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forecasting competence</td>
<td>203</td>
<td>.445</td>
<td>.487</td>
</tr>
<tr>
<td>Cost control</td>
<td>203</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3 reports the extent to which competence in forecasting predicts building construction students’ attainment in cost control of building resources in construction industry. The analysis revealed a correlation (R) of .445. This value is moderate and shows a positive prediction. Also the result of the test revealed the coefficient of determination $R^2$ value of .487 meaning 48.7% forecasting competence predicts students attainment in cost control resources in construction industry.

**Null Hypothesis 1 Competence in scheduling does not significantly predict building construction students’ attainment in cost control of building resources in construction industry.**

Table 5 Result of significant level in Linear regression analysis on competence in scheduling as a predictor of building construction students’ attainment in cost control of building resources in construction industry.

<table>
<thead>
<tr>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Regression</td>
<td>1</td>
<td>8.827</td>
<td>19.61</td>
<td>.039</td>
</tr>
<tr>
<td>Residual</td>
<td>202</td>
<td>.450</td>
<td>.</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>203</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

R = .634, $R^2 = 0.690$

Table 5 shows the linear regression result that competence in scheduling is significantly a predictor of building construction students’ attainment in cost control of building resources in construction industry. $F(1,202) = 19.61$, $P = .039$ since the p-value was less than the significant level of .05, the null hypothesis was rejected. Thus, competence in scheduling was accounted for approximately 69.0% of the explained variability in building construction student cost control of resources. The regression was: 634 +.690 (scheduling competence). This implies that for every unit increase in scheduling competence, building construction students attainment of cost control of resources in building construction industry, will increase on the average by .690 times. This means that 69.0% variation in building construction students attainment of cost control of resources in building construction industry was as a result of scheduling competency.

**Null hypothesis 2:** Competence in control report does not significantly predict building construction students’ attainment in cost control of building resources in construction industry.

**Table 5 Result of significant level in Linear regression analysis on competence in control report as a predictor of building construction students’ attainment in cost control of building resources in construction industry.**

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Regression</td>
<td>9.767</td>
<td>1</td>
<td>9.767</td>
<td>18.60</td>
<td>.019</td>
</tr>
<tr>
<td>Residual</td>
<td>26.435</td>
<td>202</td>
<td>.525</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>36.202</td>
<td>203</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

R = .537, $R^2 = 0.733$

Table 6 shows the linear regression result that competence in cost report is significantly a predictor of building construction students’ attainment in cost control of building resources in construction industry. $F(1,202) = 18.60$, $P = .019$ since the p-value was less than the significant
level of .05, the null hypothesis was rejected. Thus, competence in cost report was accounted for approximately 73.3\% of the explained variability in building construction student cost control of resources. The regression was: 537 +.733 (cost report competence). This implies that for every unit increase in cost report competence, building construction students attainment of cost control of resources in building construction industry, will increase on the average by .733 times. This means that 73.3\% variation in building construction students attainment of cost control of resources in building construction industry was as a result of cost report competency.

**Null hypothesis 3 Competence in monitoring does not significantly predict building construction students’ attainment in cost control of building resources in construction industry in Akwa Ibom State.**

**Table 6 Result of significant level in Linear regression analysis on competence in monitoring as a predictor of building construction students’ attainment in cost control of building resources in construction industry.**

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Regression</td>
<td>6.491</td>
<td>1</td>
<td>6.491</td>
<td>12.72</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>24.489</td>
<td>202</td>
<td>.510</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>30.980</td>
<td>203</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

R = .776, R^2 = 0.602  

Table 7 shows the linear regression result that competence in monitoring is significantly a predictor of building construction students’ attainment in cost control of building resources in construction industry. F(1,202) =12.72, P=.045 since the p-value was less than the significant level of .05, the null hypothesis was rejected Thus, competence in monitoring was accounted for approximately 60.2\% of the explained variability in building construction student cost control of resources. The regression was: 776 +.602 (monitoring competence). This implies that for every unit increase in monitoring competence, building construction students attainment of cost control of resources in building construction industry, will increase on the average by .602 times. This means that 60.2\% variation in building construction students attainment of cost control of resources in building construction industry was as a result of monitoring competency.
Null Hypothesis 4. Competence in forecasting does not significantly predict building construction students’ attainment in cost control of building resources in construction industry.

Table 6 Result of significant level in Linear regression analysis on competence in forecasting as a predictor of building construction students’ attainment in cost control of building resources in construction industry

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>9.491</td>
<td>1</td>
<td>9.491</td>
<td>14.58</td>
<td>.028</td>
</tr>
<tr>
<td>Residual</td>
<td>24.400</td>
<td>202</td>
<td>.651</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>33.891</td>
<td>203</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

R = .445, R² = 0.487

Table 8 shows the linear regression result that competence in forecasting is significantly a predictor of building construction students’ attainment in cost control of building resources in construction industry. $F(1,202) = 14.58$, $P=.028$ since the p-value was less than the significant level of .05, the null hypothesis was rejected. Thus, competence in forecasting was accounted for approximately 48.7% of the explained variability in vocational education students self-reliance for economic diversification. The regression was: 445 + .487 (forecasting competence). This implies that for every unit increase in forecasting competence, building construction students attainment of cost control of resources in building construction industry, will increase on the average by .487 times. This means that 48.7% variation in building construction students attainment of cost control of resources in building construction industry was as a result of forecasting competency.
Discussion of the Findings

Table 1 reports the extent to which competence in scheduling predicts building construction students’ attainment in cost control of building resources in construction industry. The analysis revealed a correlation (R) of .634. This value is high and shows a strong and positive prediction. Also the result of the test revealed the coefficient of determination $R^2$ value of .690 meaning 69.0% competence in scheduling predicts students attainment in cost control resources in construction industry. Null hypothesis 1 on table 5 shows that Competence in scheduling significantly predict building construction students’ attainment in cost control of building resources in construction industry. The finding is in line with the report of Ezeji, & Onoh, (2008a) that scheduling assist in making optimum use of available fund and also avoiding exorbitant commitment. This finding implies that scheduling of building resources contribute to stimulating and eliciting confidence that are produced by the construction industry.

Research Question 2 on Table 2 reports the extent to which competence in control report predicts building construction students’ attainment in cost control of building resources in construction industry. The analysis revealed a correlation (R) of .537. This value is high and shows a strong and positive prediction. Also the result of the test revealed the coefficient of determination $R^2$ value of .733 meaning 73.3% competence in control report predicts students attainment in cost control resources in construction industry. Null hypothesis 2 on Table 6 revealed that Competence in control report significantly predict building construction students’ attainment in cost control of building resources in construction industry. The finding is in earlier report by Ezeji, & Onoh, (2008b) and Mitchell, (2014). at different points asserted that derivation of actual cost from anticipated cost for all stages of the work provide important information for the contractor. This finding implies that essential condition for success of a construction industry is to keep constant control on cost over finance, budgeting, purchasing job allocation even during contract of the building project.

Research Question 3 on Table 3 reports the extent to which competence in monitoring predicts building construction students’ attainment in cost control of building resources in construction industry. The analysis revealed a correlation (R) of .776. This value is high and shows a strong and positive prediction. Also the result of the test revealed the coefficient of determination $R^2$ value of .602 meaning 60.2% competence in monitoring predicts students
Research Question 4: on Table 4 reports the extent to which competence in forecasting predicts building construction students’ attainment in cost control of building resources in construction industry. The analysis revealed a correlation (R) of .445. This value is moderate and shows a positive prediction. Also the result of the test revealed the coefficient of determination $R^2$ value of .487 meaning 48.7\% forecasting competence predicts students attainment in cost control resources in construction industry. Null Hypothesis 4. on table 8 revealed that Competence in forecasting significantly predict building construction students’ attainment in cost control of building resources in construction industry. Horngren, George, & Datar, (2013) who asserted that some means of forecasting or projecting the future course of a project is essential for management control. Meigs, Walter, & Meigs, (2008) summaries that forecasting mechanism used to assess the project status in five categories of, Budgeted Cost. Estimated total cost. Cost Committed and Cost Exposure Cost to Date. Over or (Under).This findings implies that competence in forecasting could save waste of material time, and labour.

**Recommendations:**

From the result of the study the following were recommended that:

1. Appropriate measures to control cost and waste must be put in place by the construction managers during planning and execution stages
2. Construction managers should embrace cost cutting as a strategic issue and approach the task from a marketing perspective.
3. Contractor or construction manager should contract is correctly monitoring and executed according to the cost estimation to avoid waste and unexpected expenditure that should affected the industry.

4. The construction manager should apply the technique of regular conferences with the foremen, gang leader by this re-distribution and monitoring of work completion at the expected date could be achieved

Conclusion:

Cost control determines, calculates and compares at regular periods, the cost and work output at various stages in the construction industry. An important function of cost control is the comparison of the actual cost at each stage of the work with the predicted costs allowed for estimating Cost control provides a continual check on profitability throughout the whole contract work. There must be a comparison of the intended and actual performance by means of post-estimating, this will give the construction manager immediate information about the economics of the contract. The evaluation of the weekly and monthly site cost reports is also very important to the technical manager

References


