# LEVEL OF SATISFACTION AND PERFORMANCE IN LABORATORY SUBJECTS OF COMPUTER ENGINEERING COURSES

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***ABSTRACT:*** *This study ascertained the level of satisfaction in laboratory facilities in terms of availability, adequacy, efficiency, laboratory space, and computer upgrade as well as the performance in laboratory subjects of computer engineering subjects in terms of mastery, student-teacher rapport, teaching methodology, assessment of students, and laboratory management in Caraga Administrative Region. Differences among the levels of satisfaction and performance of teachers and the relationship between these variables were also measured. Data were gathered from 221 students from colleges and universities across Caraga Region offering Bachelor of Science in Computer Engineering program through a researcher-made questionnaire. Data were analyzed using mean and ordinal rank, One-way Analysis of Variance (ANOVA) for Correlated Samples and Scheffe's test, and Pearson-r and t-test for the significant relationship.*

*The study found that the respondents are satisfied with the laboratory facilities in terms of availability, adequacy, efficiency, laboratory space, and computer upgrade. The performance of teachers in laboratory subjects is satisfactory as to mastery, student-teacher rapport, teaching methodology, assessment of students, and laboratory management. Moreover, there is no significant difference among the levels of satisfaction of the respondents in laboratory facilities but significant difference exists among the performance of teachers in laboratory subjects. There is a significant relationship between the level of satisfaction in laboratory facilities and the performance of teachers in laboratory subjects. On the basis of the results, a Prioritized Technology-Based Instruction and Satisfaction Model was formulated.*

**Keywords:** Computer Laboratory, Student Satisfaction, Teaching Performance, Model

## 1. INTRODUCTION

This study aimed to form a model based on the level of student satisfaction and teaching performance in computer engineering laboratory courses in Caraga Administrative Region [1-4]. In the Philippines, the Commission on Higher Education (CHED) includes requirements on facilities and equipment in allowing Higher Education Institutions (HEI's) offer courses to students specially those which are highly technical like engineering programs including colleges and universities in Caraga Administrative Region who are offering Bachelor of Science in Computer Engineering (BSCoE) program [5]. It is then imperative to check whether or not the performance of the teachers in these subjects is related to their satisfaction level in the laboratory facilities of the college/university where they are in as students tend to fail in laboratory subjects. This study is also rooted on CHED Memorandum Order(CMO) No.53, Series of 2006 on "Policies and Standard for Information Technology Education (ITE) Programs [6,7]."

## 2. METHODOLOGY

The study used quantitative research method specifically descriptive, differential and correlational designs. Data were gathered from 221 BS Computer Engineering students in the higher education institutions offering the programs.

A researcher-made questionnaire was used for data collection. The instrument was revised based on the corrections of the experts and concerns of the students during the dry-run. Reliability testing through run-rerun method using Pearson Product Moment Correlation for reliability was conducted to 23 graduating computer engineering students who were the respondents of the study with t-values of 2.45, 2.61, 2.35, 3.18, 4.18, 2.49, 3.29, 2.54, 2.41, and 4.20 for availability, adequacy, efficiency, laboratory space, computer upgrade, mastery, student-teacher rapport, teaching methodology, assessments of students, and laboratory management are greater than the critical t-value of 2.08 at 21 degrees of freedom leading to the rejection of the null hypotheses.. Data were analyzed using Frequency Count and Percent to determine the profile of the respondents as to sex and year level, Weighted Mean and Ordinal Rank to determine the levels of satisfaction of the respondents on laboratory facilities and of performance of the teachers in laboratory subjects, One-Way Analysis of Variance (ANOVA) for Correlated Data and Scheffē Test to determine the significant difference among the levels of satisfaction to laboratory facilities and performance of teachers in laboratory subjects as well as the significant difference of these variables when grouped by sex and year level, and Pearson-r and t-test to determine the significant relationship between the levels of satisfaction of the respondents to laboratory facilities and performance of teachers in laboratory subjects.

## 3. RESULTS AND DISCUSSION

### *Satisfaction in Laboratory Facilities*

**Table 1**
**Level of Satisfaction in Laboratory Facilities**

| Facilities | Mean | Rank | VI | QD |
|---|---|---|---|---|
| **Availability** | 3.05 | 3 | Agree | Satisfied |
| **Adequacy** | 2.82 | 5 | Agree | Satisfied |
| **Efficiency** | 3.25 | 2 | Agree | Satisfied |
| **Laboratory Space** | 3.34 | 1 | Agree | Satisfied |
| **Computer Upgrade** | 3.01 | 4 | Agree | Satisfied |
| **Grand Mean** | **3.12** | | **Agree** | **Satisfied** |

The grand mean of 3.12 indicates that the respondents are satisfied with the computer laboratories in their respective schools.

### *Teaching Performance in Laboratory Subjects*

The Table shows that the performance of the teachers is satisfactory based on the grand mean of 3.44.

**Table 2**
**Level of Performance of Teachers in Laboratory Subjects**

| Areas | Mean | Rank | VI | QD |
|---|---|---|---|---|
| **Mastery** | 3.43 | 3.5 | Agree | Satisfactory |
| **Student-Teacher Rapport** | 3.48 | 1 | Agree | Satisfactory |
| **Teaching Methodology** | 3.43 | 3.5 | Agree | Satisfactory |
| **Assessment of Students** | 3.46 | 2 | Agree | Satisfactory |
| **Laboratory Management** | 3.30 | 5 | Agree | Satisfactory |
| **Grand Mean** | **3.44** | | **Agree** | **Satisfactory** |

***Difference among Levels of Satisfaction and Teaching Performance***

Table 3 reveals the results on difference among the levels of satisfaction in laboratory facilities and among the levels of performance of teachers in laboratory subjects. The Table shows that there is no significant difference among the levels of performance of the teachers in laboratory subjects as it obtained an F-value of 1.09 which is less than the critical F-value of 2.38 at 4/880 degrees of freedom. This implies that their teaching areas are comparable [8-12].

**Table 3**
**Difference among Levels of Satisfaction in Laboratory Facilities and Performance of Teachers in Laboratory Subjects**

| Variable | df | F | F0.05 | Decision on Ho | Interpretation |
|---|---|---|---|---|---|
| **Satisfaction** | 4/880 | 16.84 | 2.38 | Rejected | Significant |
| **Performance** | 4/880 | 1.09 | 2.38 | Not Rejected | Not Significant |

However, the levels of satisfaction of the respondents in the laboratory facilities obtained an F-value of 16.84 which is greater than the critical F-value of 2.38 causing the rejection of the null hypothesis indicating that there is a significant difference among the levels of satisfaction in laboratory facilities in terms of five areas.

**Table 4**
**Scheffe's Test Results on Difference among Levels of Satisfaction in Laboratory Facilities**

| Laboratory Facilities | | F' | Decision on Ho | Interpretation |
|---|---|---|---|---|
| **Availability (M=3.05)** | **Adequacy** (M=2.82) | 10.27 | Rejected | Significant |
| | **Efficiency** (M=3.25) | 8.31 | Not Rejected | Not Significant |
| | **Laboratory Space** (M=3.34) | 16.82 | Rejected | Significant |
| | **Computer Upgrade** (M=3.01) | 0.33 | Not Rejected | Not Significant |
| **Adequacy (M=2.82)** | **Efficiency** (M=3.25) | 37.06 | Rejected | Significant |
| | **Laboratory Space** (M=3.34) | 53.36 | Rejected | Significant |
| | **Computer Upgrade** (M=3.01) | 6.90 | Not Rejected | Not Significant |
| **Efficiency (M=3.25)** | **Laboratory Space** (M=3.34) | 1.48 | Not Rejected | Not Significant |
| | **Computer Upgrade** (M=3.01) | 11.97 | Rejected | Significant |
| **Laboratory Space (M=3.34)** | **Computer Upgrade** (M=3.01) | 21.88 | Rejected | Significant |

Results entail that the computer laboratories for engineering courses are prioritizing the space of the laboratory to accommodate their students as well as the maintenance of their machines for efficient functions than the availability, upgrade and adequacy of computers and other devices. This goes to show that available gadgets are efficiently working [13-14].

***Relationship between Levels of Satisfaction and Teaching Performance***

Table 5 presents the results on relationship between levels of satisfaction and teaching performance. The Table above reveals that the t-values obtained for each pair of factor in levels of satisfaction and performance of teachers are greater than the critical t-value of 1.97 at 219 degrees of freedom. These brought the rejection of the null hypotheses.

**Table 5**
**Correlates of Satisfaction in Laboratory Facilities and Performance of Teachers in Laboratory Subjects**

| Satisfaction | Performance | r | t | Decision on Ho | Interpretation |
|---|---|---|---|---|---|
| **Availability** | Mastery | 0.56 | 10.01 | Rejected | Significant |
| | Student-Teacher Rapport | 0.58 | 10.65 | Rejected | Significant |
| | Teaching Methodology | 0.56 | 10.06 | Rejected | Significant |
| | Assessment of Students | 0.60 | 11.02 | Rejected | Significant |
| | Laboratory Management | 0.58 | 10.43 | Rejected | Significant |
| **Adequacy** | Mastery | 0.42 | 6.91 | Rejected | Significant |
| | Student-Teacher Rapport | 0.44 | 7.23 | Rejected | Significant |
| | Teaching Methodology | 0.48 | 8.00 | Rejected | Significant |
| | Assessment of Students | 0.42 | 6.90 | Rejected | Significant |
| | Laboratory Management | 0.52 | 9.04 | Rejected | Significant |
| **Efficiency** | Mastery | 0.52 | 8.93 | Rejected | Significant |
| | Student-Teacher Rapport | 0.54 | 9.49 | Rejected | Significant |
| | Teaching Methodology | 0.51 | 8.75 | Rejected | Significant |
| | Assessment | 0. | 9.0 | Rejected | Significant |

| | | | | | |
|---|---|---|---|---|---|
| | of Students | 52 | 0 | | t |
| | Laboratory Management | 0.58 | 10.49 | Rejected | Significant |
| **Laboratory Space** | Mastery | 0.45 | 7.42 | Rejected | Significant |
| | Student-Teacher Rapport | 0.54 | 9.44 | Rejected | Significant |
| | Teaching Methodology | 0.46 | 7.58 | Rejected | Significant |
| | Assessment of Students | 0.54 | 9.40 | Rejected | Significant |
| | Laboratory Management | 0.51 | 8.78 | Rejected | Significant |
| **Computer Upgrade** | Mastery | 0.51 | 8.88 | Rejected | Significant |
| | Student-Teacher Rapport | 0.50 | 8.65 | Rejected | Significant |
| | Teaching Methodology | 0.50 | 8.51 | Rejected | Significant |
| | Assessment of Students | 0.47 | 7.89 | Rejected | Significant |
| | Laboratory Management | 0.58 | 10.65 | Rejected | Significant |

***Technology Management Philosophy***

Based on the results of the study, this Prioritized Technology-Based Instruction and Student Satisfaction Model is formulated.

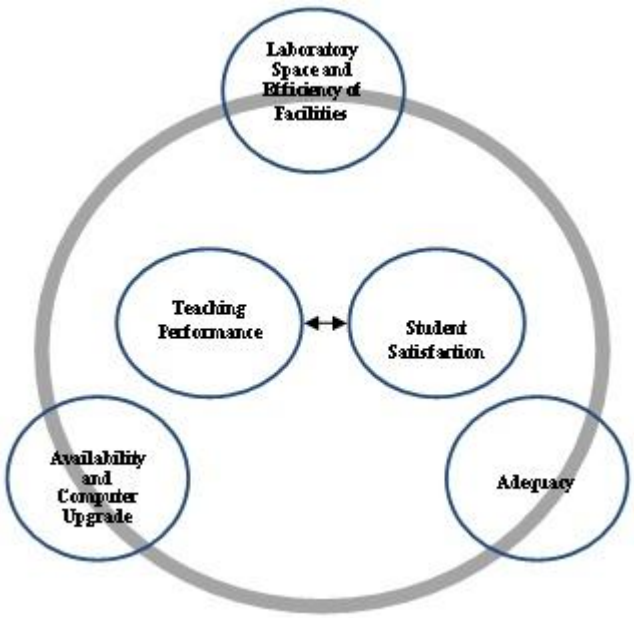


**Figure 1**
**Prioritized Technology-Based Instruction and Student Satisfaction Model**

The schools take into consideration the efficiency of whatever is available to at school since maintenance requires only manpower of the technical support group of the college or university. Laboratory spaces would be given attention since these are necessary to fit students into the room. These would have influence to instruction and performance of teachers. The performance of teachers which is influenced by technology will in turn influence satisfaction of students in laboratory facilities [15-16].

## 4. CONCLUSIONS

The findings of the study drew the following conclusions.

The computer engineering program of colleges and universities in Caraga Region is equipped with laboratory facilities that adhere to CMO 25, Series of 2005. Laboratory classes are held in spacious computer laboratories with efficient and updated computers and other paraphernalia. The instructors and professors of computer engineering programs in Caraga Region taught laboratory subjects are intellectually and pedagogically competent. The colleges and universities in Caraga Region give top priority to efficiency of laboratory space and facilities. Provision of state-of-the-art computer laboratory facilities influence teaching performance in laboratory subjects. Prioritizing laboratory space and efficiency of available facilities followed by availability and computer upgrade with adequacy as the last concern leads to satisfactory teaching performance and satisfied students.

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