

POLYTECHNIC UNIVERSITY OF THE PHILIPPINES ELECTRONICS AND COMMUNICATIONS ENGINEERING AUTOMATED LABORATORY (AUTOLAB) SYSTEM FOR TRANSACTION AND EQUIPMENT MONITORING

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Abstract

The aim of the study is to implement bar coding system as mechanism for the PUP ECE Laboratory Transaction recording and monitoring. The study was concerned on proper documenting and managing the daily transaction of the ECE Laboratory particularly to automate the existing manual mechanism procedure with the proposed AutoLab System. The study used Quasi-Experimental method as it included both experimental and descriptive method to gather data for the study. Experimental in a way that the system was subjected to series of experiments to test its accuracy, efficiency, effectiveness and reliability using the single-group design. Two main experiments have been conducted - the test for accuracy of the system in transaction recording and the equipment inventory monitoring. Test for accuracy was divided into four parts namely (1) Borrowing of Key; (2) Borrowing of Equipment; (3) Returning of Keys; and, (4) Returning of Equipment. On the other hand, the equipment inventory monitoring incorporates the analysis of the equipment utilization; from such as what equipments are usually borrowed, in what subjects a certain equipment is being used and the history of usage for a given equipment. The descriptive part was used to evaluate the system in three variables - the Graphical User Interface, the Accuracy of Information displayed and the Transaction Recording - daily rated from scales 1 to 5; 5 being the highest through survey among the ECE students and faculty members. The ECE Room Utilization Log Book, ECE Transaction Log Book and the Borrower's Slip have been analyzed to assess the existing transaction recording and inventory monitoring. Results showed that the AutoLab System effectively automated the recording of transactions merging the existing manual method into one recording mechanism. Manual transaction recording cannot provide a 100% effectivity since there were percentages of 9.39% of the 2300 ECE Room Utilization Log Book transactions, 41.38% of the 742 Borrower's Slip transactions and 43.94% of the 603 ECE Transactions Log Book entries that were analyzed. A 100% complete data being filled-out on the ECE Borrower's Slip and the ECE Transactions Log Book permits a more comprehensive study of equipment inventory monitoring which gives a detailed room utilization for the ECE Room Utilization Log Book. The Automated Laboratory coined as AutoLab merged the ECE Room Utilization Log Book, ECE Borrower's Slip and the ECE Transaction Log Book into one complete package in terms of transaction recording and equipment inventory monitoring incorporating four databases- the class list, the room utilization, the class schedule and the equipments. As PUP Student Identification Cards have bar codes that embed the student number, the system utilized the information to extract details regarding the identity of the student necessary for transaction and equipment inventory monitoring. Two hundred sixty seven (267) ECE students from the 1142 ECE student population and 19 ECE Faculty Members served as respondents for the study. The respondents assessed the system in three areas - the Graphical User Interface (GUI), the Accuracy of Information Displayed and the Transaction Recording. Respondents rated the GUI in terms of design, user friendliness, minimal amount of time to perform its function and reliability. Overall rating of the system in terms of design was 4.22 (Effective); user friendliness was 4.50 (Effective); minimal amount of time to perform function was 4.51 (Highly Effective) and reliability to be 4.50 (Effective). In terms of the Accuracy of Information Displayed, the overall assessment for accuracy of reading of student Identification card was 4.72 (Highly Effective), accuracy of information being displayed was 4.71 (Highly Effective), accuracy of reading for room key to be 4.74 (Highly Effective) and equipment with 4.75 (Highly Effective). Overall rating of the system in terms of recording of borrower's information as 4.72 (Highly Effective), recording of key 4.71 (Highly Effective), recording of equipment 4.68 (Highly Effective) and updating of record to be 4.70 (Highly Effective). The results from the faculty and student respondents were subjected to T-test analysis to determine whether there is a significant difference between their assessments. Results have shown that there was no significant difference between student and faculty assessment.

Keywords: Laboratory Management, Automation, Equipment Inventory Monitoring, Bar Coding

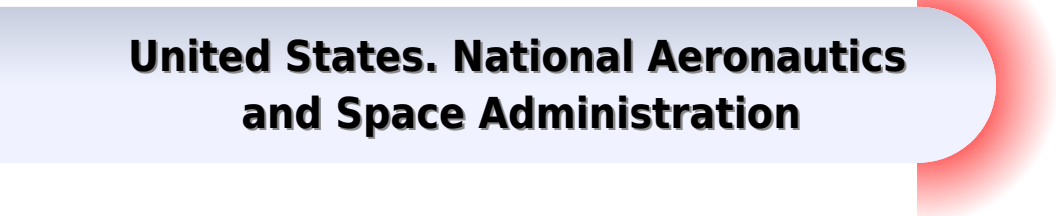
1. INTRODUCTION

Engineering is a vital field for economic and technological modernization in a country nowadays. It encompasses the application of scientific and practical knowledge to invent,

design, build, maintain and improve structures, systems and processes scattered through the different area of specializations where the Electronics and Communications belong.

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web following is the equation which can be used for the shear force calculation shear force w a l here w is a the applied load on beam a is the distance between the pivot point and point of force application 400 l is the total length of the beam 440 for w 0 shear force w a l 0 400 440 0 n

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