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Design and Build a Learning Model for Cost Control Courses Based on Material Control Systems

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***Abstract*—Cost control learning is one of the important courses in the tourism department that deserves attention, especially the development of the learning model. The importance of developing a learning model for cost control courses because this course has a major role in increasing student competence in the industry, especially the hospitality industry. Learning cost control courses at the Tourism Department of PNB is still manual, not using a system. The Bali State Polytechnic Tourism Department itself already has an integrated material control system from Oracle but it has not been applied to the learning process for cost control courses. Based on the above background, the author is interested in designing a learning model for cost control courses based on a material control system. Before compiling the model, the author will conduct a survey and collect field data in several hotels that have MOUs with PNB to see how the implementation of cost control is applied in these hotels and conduct case studies in classes taking cost control courses. The research method used in this research is quasi-experimental with pretest-posttest design using a control group (Control Group Pretest-posttest Design). The research subjects are second semester students of the Hospitality Study Program, Department of Tourism, Bali State Polytechnic. The result of this research is that the learning outcomes of the experimental class are greater than those of the control class. This can happen because in the experimental class, using the material control system method with the Opera application, which makes it easier to improve students' understanding of cost control. In the control class students experience learning activities through conventional methods so that students work on all the cases given manually and by using many forms so it is less effective and efficient.**

Keywords: learning system, cost control subject, cost control system, Material Control, Oracle

I. BACKGROUND

Efforts to improve the quality of education is a process that is carried out continuously and continuously. Improving the quality of learning is carried out with the aim of achieving good educational goals. Various efforts have been made by the government to improve the quality of national education. These efforts include improving and developing the curriculum, improving the evaluation system, improving educational facilities and infrastructure, and developing learning materials and models. Cost control learning is one of the important courses in the tourism department that deserves attention, especially the development of the learning model.

In running a business, a company not only thinks about its business and marketing strategy but also has to think about how to manage and control costs. The company's operational costs if there are leaks, especially if the leaks are subtle or small, then the company is in an unhealthy condition even though in terms of income it continues to increase. According to Sondang. S. Giagian (1999: 16) states that cost

control is a systematic process or effort in setting implementation standards aimed at planning, feedback information systems, comparing actual implementation with planning, determining and regulating deviations and making corrections according to with a predetermined plan,

The service industry, especially in the hospitality and culinary fields, is growing. This development is always followed by the high level of competition between industries. The Hospitality Industry is an industry related to Food Service, Lodging, Tourism and Entertainment. However, it is often narrowly associated with the hospitality industry. Hospitality industry operations are generally labor intensive or use a lot of labor (labor intensive) and require serious control compared to other industries. Products from the hospitality industry are very different from manufactured products. Hospitality products are perishable and cannot be stored back in the warehouse if they are not sold.

An important question in hotel operations, namely: What to control?'. Most of the hotel operational costs are labor, food and beverages, so these three costs are the main things that must be monitored by management. Management must strive to keep the three costs on track or the standards that have been set. The combination of these three costs can be found in Food Service or Restautant operations. Without a control on these costs, the restaurant will lose its competitiveness. Cost control needs to be carried out in the entire process from purchasing, storing, preparation and service. Products must be purchased according to the most optimal specifications and prices. Products stored in warehouses in minimum quantities to prevent damage or theft. Management always observes the production process, asks guests' opinions and evaluates things that deviate from the standard. Management must provide feedback on employee performance, whether good or bad, consistently. Employees need feedback so that they know whether their work is up to standard or not, so mistakes won't happen again.

Seeing the importance of cost control in the hospitality industry, it is necessary to prepare competent human resources to carry out the cost control function. in the Hospitality Industry. To prepare this S DM, at the Bali State Polytechnic, the Department of Tourism, the Hospitality Study Program has one course that studies cost control, namely the Cost Control course. Most of the cost control systems carried out in hotels are system-based, for example in purchasing goods, releasing raw materials from warehouses, calculating food costs and so on, while learning cost control courses in the PNB Tourism Department is still manual and does not use the system. The use of a cost control system in hotels and manual cost control courses causes concerns about the creation of human resources who are not able to quickly adapt to the system implemented in the industry. The Bali State Polytechnic Tourism Department itself already has an integrated material control system from Oracle but it has not been applied to the learning process for cost control courses.

Based on the above background, the author is interested in designing a learning model for cost control courses based on a material control system. Before compiling the model, the author will conduct a survey and collect field data in several hotels that have MOUs with GNI to see how the implementation of cost control is applied in these hotels and conduct case studies in classes taking cost control courses.

Based on the above background, the formulation of the problem in this study is:

1. How is the application of a cost control system that is run in each hotel that has a collaboration with the Bali State Polytechnic?
2. Is there a difference in students' understanding of the cost control course between students who apply material control system-based learning and students who do not apply material control system-based learning.
3. How is the learning model for cost courses based on the material control system to suit current industry needs in accordance with the results of data collection in several hotels that have cooperation with the Bali State Polytechnic.

II. LITERATURE REVIEW

2.1 Learning system

There are three concepts that will be explained in this paper, namely systems, learning, and learning systems. The system is the parts that make up the whole that are interdependent and work together in achieving the goals that have been set. These parts cannot stand alone, but need each other and interact so that the goals that are needed can be achieved.

The next concept that needs to be explained is the concept of learning. The concept of learning (instructional) can be distinguished from the concept of teaching (teaching). Learning is a deliberate, purposeful, and controlled effort so that others learn or there is a relatively permanent change in a person. The teaching is an effort to guide and direct the learning experience to students which usually takes place in an official or formal situation. In order for changes to occur as expected, learning must be planned and programmed properly. Furthermore, in order for the learning program that has been prepared to run well, the program must have

attractiveness, usability (effectiveness), and usability (efficiency).

2.2 Definition of Cost

Cost is a sacrifice or expense made by a company or individual that aims to obtain more benefits from the activities carried out (Raharjaputra, 2009). In terms of costs, sometimes it is quite inconvenient to distinguish between costs and expenses. To distinguish them, it is explained as follows.Costs are costs in the sense of sacrifices/expenditures made by a company or individual that are directly related to the output/product produced by the company/individual. For example: raw and auxiliary materials, direct labor costs, and general factory costs (factory foreman/supervisor, factory GM, fuel, factory supply, factory electricity, and others). In the structure of the company's Profit/Loss report it is usually called the Cost of Production.

Expenses are costs incurred by companies or individuals that are only supporting activities, for example: general and administrative costs, and marketing/sales costs, such as salaries for head office employees, telephone/water/gas/AC costs for head office, sales and marketing costs , and others.

2.3 Oracle Hospitality Materials Control System

Oracle Hospitality Materials Control is a comprehensive procurement, inventory and cost control system tailored to meet the requirements of the hospitality industry. This solution manages all property inventory, provides critical real-time information on cost of sales, effective revenue, stock on hand, order proposals, and stocking requirements, and brings efficiencies to daily workflows and food cost management.

Efficient Food and Beverage Management Oracle Hospitality Materials Control enables unprecedented effectiveness in inventory management. Daily sales data is automatically imported into the system from the point of sale system and will reduce the stock based on the associated recipe. Comparison with actual stock usage allows for rapid management intervention when nonconformities are revealed. The ability to log and monitor waste and spills for each outlet allows you to identify and track patterns. Multilevel purchasing authorization allows cash flow monitoring to minimize overstocking. Real-Time Analysis Real-time data provided by Oracle Hospitality Materials Control enables a wide range of analysis, from cost of sales to revenue. Stock available, ordering templates, and par lists are also available. Information can be easily reviewed by outlets, properties or entire portfolios. Improved data validity for all departments with an interface to the back-office system. In addition, Oracle Hospitality Materials Control streamlines the reconciliation and month-end accounting process. Improved Operations Workflow Oracle Hospitality Materials Control streamlines daily processes related to purchasing, supplier and price management, and internal requisitions. To speed up the ordering and receiving process, you can send purchase orders directly to suppliers from within the app via email, fax, or B2B interface. Using the Oracle Hospitality Materials Control web client, you can deploy internal requests paperless. Information can be easily reviewed by outlets, properties or entire portfolios. Improved data validity for all departments with an interface to the back-office system. In addition, Oracle Hospitality Materials Control streamlines the reconciliation and month-end accounting process. Improved Operations Workflow Oracle Hospitality Materials Control streamlines daily processes related to purchasing, supplier and price management, and internal requisitions. To speed up the ordering and receiving process, you can send purchase orders directly to suppliers from within the app via email, fax, or B2B interface. Using the Oracle Hospitality Materials Control web client, you can deploy internal requests paperless. Information can be easily reviewed by outlets, properties or entire portfolios. Improved data validity for all departments with an interface to the back-office system. In addition, Oracle Hospitality Materials Control streamlines the reconciliation and month-end accounting process. Improved Operations Workflow Oracle Hospitality Materials Control streamlines daily processes related to purchasing, supplier and price management, and internal requisitions. To speed up the ordering and receiving process, you can send purchase orders directly to suppliers from within the app via email, fax, or B2B interface. Using the Oracle Hospitality Materials Control web client, you can deploy internal requests paperless. Improved data validity for all departments with an interface to the back-office system. In addition, Oracle Hospitality Materials Control streamlines the reconciliation and month-end accounting process. Improved Operations Workflow Oracle Hospitality Materials Control streamlines daily processes related to purchasing, supplier and price management, and internal requisitions. To speed up the ordering and receiving process, you can send purchase orders directly to suppliers from within the app via email, fax, or B2B interface. Using the Oracle Hospitality Materials Control web client, you can deploy internal requests paperless. Improved data validity for all departments with an interface to the back-office system. In addition, Oracle Hospitality Materials Control streamlines the reconciliation and month-end accounting process. Improved Operations Workflow Oracle Hospitality Materials Control streamlines daily processes related

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Purchase Manager module Oracle Hospitality Materials Control offers a Purchase Manager module, which solves today's complex booking processes in the hotel industry and other markets. The hotel restaurant manager continually submits purchase requisitions to the purchasing department. The Purchase Manager module allows purchasing managers to review and approve a single purchase requisition or combine multiple requests from multiple food and beverage outlets into a single order.

III. RESEARCH METHODS

3.1 Location and respondents

The research will be carried out in hotels that have an MOU with Bali State Polytechnic, the respondents are cost controllers in each hotel and in the Hospitality Study Program, Department of Tourism, Bali State Polytechnic, the respondents are 2nd semester students taking cost control courses.

3.2 Technique data collection

The population of this research is second semester students who take cost control courses and also cost controllers at hotels that have an MOU with PNB.

3.3 Data Type

The data used in this study are primary data and secondary data. The explanation is as follows.

1. Primary data
   The primary data used by the researcher are: the results of interviews according to the question items, the results of case studies, and so on
2. Secondary Data
   Secondary data used by researchers in this scientific work is literature on learning models, cost control and material control systems

3.4 Data Analysis Techniques

Previously, the author made direct observations on how to apply cost control in the field and conducted interviews with cost controllers in several hotels that have MOUs with the Bali State Polytechnic.

The research method used in this research is quasi-experimental with pretest-posttest design using a control group (Control Group Pretest-posttest Design) (Arikunto, 2006). The research subjects are second semester students of the Hospitality Study Program, Department of Tourism, Bali State Polytechnic. The experimental group consisted of 27 people, while the control group consisted of 27 people. The experimental group was given a learning model using the control system material and the control group with a conventional learning model. Material control system-based learning is carried out by working on practice questions in the cost control module which is carried out using the Material Control System software from Oracle.

IV. DISCUSSION

4.1 Application of Cost Control System in Hotels

The hotel is a business unit that offers room services, meeting rooms, food, beverages and various other services, all of which are intended to serve staying guests. Room service revenue contributes approximately 55% of total hotel revenue, and the second largest revenue is from food and beverage which contributes approximately 40%, and for the percentage range of basic prices, it really depends on the type of hotel class and the profit target determined by the management. . For standard III and IV star hotels, specifically for food, the basic price ranges from 30-40% of the selling price, while for drinks it is between 25-30% of the selling price, this data is based on the results of a survey of several hotels that were respondents in this study. To achieve revenue and effectiveness targets, hotels need an accurate budget and cost control system as a management guide that can be improved in terms of service, menu and consistency of taste, dosage, appearance, and quality of raw materials used for operational purposes. In the process of controlling hotel operational costs, respondents in this study have carried out several control measures including:

1. Carry out recording and authorization for expenses.
2. Establish a budget as the basis for measuring operational costs.
3. Comparing the realization of costs with the hotel budget and measuring the level of management performance that is effective in managing hotel costs.
4. Determine the analysis of the difference and report the cause and after knowing the realization that occurred in that period, a comparison is made between the realization and the budget that has been determined.

The main factor that causes high hotel operating costs is the Cost of Production (HPP), especially food and beverages as well as overhead costs that go into HPP, by controlling the quality of food and beverage products offered in accordance with those determined by hotel standards, the cost of food and beverages must be can be controlled and must also determine the standard size (standard portion size) to achieve the profit target set by the hotel management. The profit target can be achieved if the cost of goods can be controlled and to improve the operational efficiency of food and beverage production, menus that are not popular or not sold can be replaced with other menu items in order to optimize hotel profits.

The target price for F&B can be achieved if there is good coordination between the purchasing function (purchasing), receiving, storage and production (store), production (kitchen) and the sales function (sales/restaurant). , the process of releasing goods and the production process up to a good sales function. To determine the cost of production, three important elements are needed in each hotel, namely direct costs (raw materials, direct labor costs and indirect hotel overhead costs).

As explained by accounting experts that cost management must be considered because it will have a negative impact on hotel profits if it is managed poorly and will become a benchmark for the hotel's performance of each department on the results it has achieved, whether it is normal, sufficient or not. maybe even give a lot of changes to the Hotel. One of the control systems used in hotel management is as follows:

1. Planning / Planning, in the formulation of hotel planning based on democracy, namely uniting the opinions of all employees.
2. Organizing / Organizing means bringing many functional units from one hotel into a coordinated structure and assigning authority and responsibility to individuals.
3. Actuating / Implementing everything that has been planned by management so that it is directed and carries out what has been determined. The implementation itself is carried out by all elements in the hotel and supervised by operational managers under the command of the general manager who prioritizes operational activities so that they run according to plan.
4. Controlling for each activity is monitored continuously to ensure the results are within the desired limits and evaluated every month from the development of the hotel's performance in order to maintain and monitor the rate of development of the hotel.

4.2 Quasi Experimental Research

The implementation of this quasi-experimental research involved 2 groups, namely the experimental group and the control group. The experimental group used a learning model using a material control system, the control group used a conventional method. In this study the author acts as an observer. The activities carried out at the planning stage of this research are preparing the syllabus, Semester Learning Plan (RPS), making assessment guidelines, preparing materials that are in accordance with the competencies to be taught and making learning media.

The assessment aspect is making Purchase Requitition, Purchase Order, Daily Receiving Report, Bincard and Cardex forms. Another aspect of the assessment is to calculate the value of inventories and costs of raw materials issued by physical and perpetual methods.

4.3 Student Learning Outcomes with Material Control System Method

The initial learning activities using the control system material in the experimental class began with preparing learning as usual, the lecturer prepared case examples regarding the purchasing and dispensing system of supplies that usually occurs in the hotel industry and students were assigned to make the related forms in it. In the initial test, the lecturer gave an overview of the system of purchasing and dispensing supplies at the hotel and divided the students into six groups. Students are given several cases and questions. After the students have finished discussing their group assignments, then the lecturer appoints one student in each group to answer questions and the other friends are not allowed to help. This is because all group members are ready and understand the learning material so that the group does not only rely on certain students. After students answer student questions, the lecturer gives an assessment. Students are so enthusiastic to understand the material and their group assignments because each student determines the value of his group. The group that gets the highest score gets an award. At the end of the lesson, the lecturer gives a final test to find out

how far the students understand the lesson. The final test is carried out by assigning students to compile the forms needed in the inventory purchasing and dispensing system and determine the inventory value and raw material costs by doing it through the material control system. Students are so enthusiastic to understand the material and their group assignments because each student determines the value of his group. The group that gets the highest score gets an award. At the end of the lesson, the lecturer gives a final test to find out how far the students understand the lesson. The final test is carried out by assigning students to compile the forms needed in the inventory purchasing and dispensing system and determine the inventory value and raw material costs by doing it through the material control system. Students are so enthusiastic to understand the material and their group assignments because each student determines the value of his group. The group that gets the highest score gets an award. At the end of the lesson, the lecturer gives a final test to find out how far the students understand the lesson. The final test is carried out by assigning students to compile the forms needed in the inventory purchasing and dispensing system and determine the inventory value and raw material costs by doing it through the material control system.

In the initial test, there were 3 students who got good predicate, 22 students who got enough predicate, 2 students who got less predicate, very good predicate and none at all. NThe highest score in this initial test was 78 and the lowest score was 55. As for the results of the final test held after learning, the number of students who got a very good predicate as many as 6 students, who got a good predicate as many as 16 students, who got a sufficient predicate as many as 5 students, who got a less predicate and none at all.

4.4 Student Learning Outcomes with Conventional Methods

The initial learning activity using conventional methods in the control class begins with preparing learning as usual, the lecturer conducts an explanation and initial test by making a case regarding the inventory purchasing and dispensing system that usually occurs in the hotel industry and students are assigned to make forms related to it. . At the end of the lesson, the lecturer gives a final test to find out how far the students understand the lesson. The final test is carried out by assigning students to compile the forms needed in the inventory purchasing and dispensing system as well as determining the inventory value and raw material costs by doing it manually.

In the initial test, the number of students who received good predicates was 8 students, 19 students received sufficient predicates, very good predicates, less and none at all. NThe highest score in this initial test was 78 and the lowest score was 61 out of a maximum score of 100. After learning the final test was held, the number of students who received a very good predicate as many as 2 students, 12 students received a good predicate, 14 students received a sufficient predicate, and none received a poor predicate.

4.5 Discussion of Requirements Analysis

Normality test

Normality test was conducted to determine whether the study population was normally distributed or not. For this test using the Kolmogorov-Smirnov test formula. This normality test was carried out on the experimental class and control class data including the results of the initial and final tests of each group. Based on the Kolmogorov-Smirnov calculation from table 1.

Table 1. Normality Test of Experimental Group Data

Test	N	mean	D_{max}	D_{table}
Pre-Test	27	65.52	-0.09453	0.2730
Final Test		77.53	-0.1682	

In the initial test obtained Dmax < D table, the population of the initial test data for the experimental group was normally distributed. In the final test, Dmax < Dtable, the population of the final test data for the experimental group is normally distributed.

Table 2. Normality Test of Control Group Data

Klmpk	N	Varians (s)	χ^2 count	χ^2 table	Keterangan
Eksp	27	5,3	0,40	3,52	Homogen
Ktrl	27	5,15	0,9	3,52	Homogen

By using the Kolmogorov-Smirnov formula, based on the calculation of Dmax < D table, the population of the initial test data for the control group was normally distributed. In the final test, Dmax < Dtable, the population of the control group's final test data was normally distributed.

A. *Homogeneity Test*

The results of the homogeneity test calculation can be seen in table 3

Table 3. Homogeneity Test

Test	N	mean	D_{max}	D_{table}
Pre-Test	27	67	0.04120	0.2235
Final Test		73.31	-0.07122	

Based on the table above, it shows that the data from the two groups have a homogeneous variance where the value of 2 count < 2 table. so that the next test can be carried out, namely hypothesis testing.

B. *Hypothesis test*

After doing the normality test and the homogeneity of variance test so as to get the results of data that are normally distributed and get homogeneous variances. Next, perform a statistical test t. Below will be presented the data from the statistical test t. The results of the initial test differences between the experimental group and the control group can be seen in the table below:

Table 4. Differences in the initial test of the experimental group and the control group

Group	N	mean	Md	T_{count}	T_{table}
Experiment	27	65.24	-1.44	-0.33	2.056
Control	27	67			

From the t-test, it can be obtained that the t-count value is -0.33 which is actually smaller than the 5% t-table value, which is 2.056. Thus, it means that the initial test has no significant difference between the experimental group and the control group.

After each group was given treatment, the researcher conducted a final test on each group. From the final test data obtained, the difference between the initial test and the final test in the experimental group and the control group can be seen in table 10 below:

Table 5. Differences in the final test of the experimental group and the control group

Group	N	mean	Md	T_{count}	T_{table}
Experiment	27	77.33	4.33	3.31	2.056
Control	27	73.21			

From the t-test, it can be obtained that the t-count value is 3.31 which is actually greater than the t-table value of 5%, which is 2.056. Thus, it means that in the final test there is a significant difference between the experimental group and the control group.

From the final test data obtained, the difference between the initial test and the final test in the experimental group and control group can be seen in the table below:

Table 6. Calculation of the difference in the value of the initial test and post-test of th experimental group

Tes	N	Mean	Md	T_{count}	T_{table}
Tes Awal	27	67,46	11,96	16,16	2,056
Tes Akhir	27	79,55			

From the t-test that was carried out, it was obtained that the t-count value was 16.16, which turned out to be greater than the t-table value of 5%, which was 2.056. This means that there is a significant difference between the initial test and the post-test in the experimental group.

Table 7. Calculation of the difference in the value of the initial test and the control group post-test

Test	N	mean	Md	T count	T table
Pre-Test	27	69	6.18	14.71	2.056
Final Test	27	75.53			

From the t-test performed, it can be obtained that the t-count value is 14.71 which turns out to be greater than the t-table value of 5%, which is 2.056. This means that there is a significant difference between the initial test and the post-test in the control group.

Based on the test results from the initial and final tests above, it can be concluded that the students' initial abilities between the experimental class and the control class are the same while their learning outcomes after receiving treatment are different. Thus the research hypothesis which reads "There are differences in student learning outcomes using the material control system-based learning method and conventional methods in cost control courses" can be accepted.

C. *Discussion*

From the research data that has been analyzed, it is found that the average initial test score for the experimental class = 65.24, this shows that the initial ability of students about the material being tested is still very low because generally students have not studied it. In doing this initial test, students basically make this discourse just by guessing. After being given treatment in the form of learning with the material control system method, a final test was held with the average score of 77.33. An increase in the results of this test, because students make discourses based on the knowledge they have learned from the learning treatment that has been given.

In the control group who were given learning using conventional methods, the average score of the initial test given was 67. As in the experimental class, students generally answered this initial test by guessing because they had not studied the material being tested. While the results of the final test given after students received learning treatment with the manual method, obtained an average value of 73.21, which means an increase compared to the results of the initial test.

When compared to the average initial test scores of the two study groups, it can be seen that the learning outcomes of the experimental class are greater than those of the control class. This can happen because in the experimental class, using the material control system method with the Opera application, which makes it easier to improve students' understanding of cost control. In the control class students experience learning activities through conventional methods so that students work on all the

cases given manually and by using many forms so it is less effective and efficient.

From the two learning activities discussed above, it can be understood that in learning with a material control system, students get a deeper learning experience so that they get better learning outcomes compared to conventional learning methods.

4.6 Material Control System-Based Learning Model

Seeing the results of the study where students who received learning using the material control system got a better understanding than conventional methods, it is very necessary that the Bali State Polytechnic, especially the tourism department, change the learning method for cost control courses based on the material control system through Opera.

V. CONCLUSION

The conceptual model is a description of the model to be developed which consists of theories and principles that are the background for the design of the cost control learning system development material based control system. The flow of the conceptual model of SPBK refers to the theory and principles of system development proposed by experts.

The output of this procedural model resulted in a program for developing cost control courses based on the Material Control System. The steps for developing this learning model produce learning tools, namely learning materials consisting of syllabus, lesson plans, guides for lecturers, guides for students and control system materials. The models used as the basis for development include Borg and Gall, Dick and Carey as well as Hannafin and Peck. The Borg and Gall models emphasize research models in general. Dick and Carey's model on the development of instructional design and Hannafin and Peck put more emphasis on the simplified stages of research and development activities.

The final draft of the development of this learning model is the procedure for using the Material Control System

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