

Development of Spreadsheet-Based Applications for Learning of Financial Management

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Abstract—Spreadsheet based applications are needed by students and lecturers to expedite the financial management learning process. The aim of the research was to produce a spreadsheet-based application for financial management that can be used for real learning. Spreadsheet-based application for financial management includes cash, accounts receivable, inventory, fixed assets, liabilities, equity, financial ratios, and time value of money management. his study uses a qualitative approach with descriptive methods. The research model used was adapted from the research and development model with stages: 1) analysis of the needs of teaching materials; 2) development of a draft spreadsheet-based application for financial management; 3) testing draft spreadsheet-based applications for financial management. The results of the study is a spreadsheet-based application for financial management can be used in real learning. The test results show that spreadsheet-based applications have given the same results as the manual calculation results.

Keywords— *application, spreadsheet, learning, management, finance*

I. INTRODUCTION

Financial management courses are not only taught in universities that are on academic paths such as universities, but are also taught in universities on vocational lines such as polytechnics. Financial management courses are generally taught in study programs or departments such as economics, management, accounting, and others.

At the Bali State Polytechnic, financial management courses are also taught in study programs under the Department of Accounting, Business Administration, and also the Department of Tourism. Financial management courses provide understanding, explanation and practice regarding financial performance evaluation, working capital management such as management, accounts receivable, inventory, debt, capital, applying the concept of *time value of*

money, and making investment decisions in securities and fixed assets.

The financial management teaching materials used at the Bali State Polytechnic are still manual. Learning material for spreadsheet -based financial management has not been used because teaching materials for introducing spreadsheet -based financial management as needed are not yet available. According to [1], spreadsheet still widely used in conjunction with other software in business processes for more efficient financial processes. Therefore, teaching materials spreadsheet-based financial management need to be developed. In accordance with what was stated by [2], that the development of teaching materials needs to be done if the teaching material of a subject is difficult to obtain or the subject matter is quite difficult.

Learning material for spreadsheet -based financial management will very useful not only for students and lecturers at polytechnics but also useful for other universities because the content of teaching financial management at other Polytechnics and Universities is relatively the same. Use of spreadsheet -based financial management teaching materials expected to increase student learning activities [3].

The general objective of this study is to produce spreadsheet -based applications for financial management and application-based financial management teaching materials spreadsheet that can be used for real learning.

II. RESEARCH METHODS

This study uses a qualitative approach with descriptive methods. The research model used was adapted from the model of research and development (*Research & Development*) Borg & Gall are modified according to needs.

The procedure of research and development (*Research & Development*) module adapted from Borg & Gall modified research in six stages: 1) needs analysis Subjects, 2)

Development Application Draft *Spreadsheet*- based, 3) Draft Testing *Spreadsheet* -based applications for financial management, 4) Determine teaching material models, 5) Development of draft teaching materials, 6) Testing draft teaching materials

This type of data, data collection methods and instruments used in the development of the first year can be seen in Table 1 and 2.

Table 1. Types of Data, Methods and Data Collection Instruments

No.	Data Type	Method of collecting data	Instrument
1	Curriculum, SAP, Types of teaching materials	Documentation	Guidelines for recording curriculum documents
2.	Student assessment of teaching materials	Survey Interview	Questionnaire interview guidelines
3.	Student expectations for teaching materials	Survey Interview	Questionnaire interview guidelines

Table 2. Application Performance Data Collection Instrument

No.	Measured Aspects	Data source	Instrument
1	Technical Performance	Student / Lecturer, Expert, and Practitioner	Questionnaire
2.	Operations Performance	Student / Lecturer Expert, and Practitioner	Questionnaire

III. RESULTS AND DISCUSSION

Finance is one of the main functions in the company in addition to the functions of marketing, personnel, production and accounting. Financial Management is management of financial functions. Function is the main activity that must be carried out by those responsible in certain fields. Financial management is a combination of science and art that discusses, studies, and analyzes about efforts to obtain, manage, and share funds [4,5,6]. The task of financial management according to [7] is included in three financial decisions, namely: 1) determining the allocation of funds; 2) decide on alternative financing; and 3) policy in dividend distribution. The decision to determine the allocation of funds is reflected on the left side of the statement of financial position which shows the shape of the company's wealth.

The Research & Development approach developed by Borg & Gall is often used in teaching material development research [2]. [8, concerning Development of Instrument and Teaching Materials to Improve Communication, Reasoning, and Mathematical Connections in Integral Concepts. [9], about the development of fixed asset modules based on the scientific approach as supporting the implementation of K-13. [10], concerning the development of a receivable accounting

module based on scientific approach to financial accounting subjects. According to [11], the use of computer-based accounting introductory laboratory modules can improve the implementation of learning programs, learning activities, and learning outcomes.

Some researchers have conducted research on the use of Microsoft Excel in learning. The use of Microsoft Excel can produce accurate information faster than the manual method [12]. The use of spreadsheet applications in accounting learning can improve understanding and mastery of teaching materials. [13,14], examined the use of excel programs to improve teaching and learning processes in introductory accounting courses. According to [3], the use of the practice module of the basics of computer-based accounting with the transaction cycle approach can improve the achievement of student competence.

Application development stages are as follows:

A. Needs Analysis Teaching Material

At this stage of the needs analysis teaching material conducted exploration about the curriculum, SAP, and teaching materials that are being used by faculty and students. Needs analysis is done so that the teaching material produced is in accordance with the needs. Learning material for *spreadsheet*-based financial management not available at the Bali State Polytechnic, so that for financial management courses it is necessary to explore units of teaching events and learning outcomes to be able to develop a draft *spreadsheet*-based application. Student assessment of financial management teaching materials and students' expectations of financial management teaching materials is carried out by conducting surveys and interviews using questionnaires.

B. Development Application Draft Based Spreadsheets for Financial Management

At the stage development of draft *spreadsheet*-based applications for financial management the design of the company's financial analysis is needed. Next, the relevant automation is carried out on the application by optimizing the use of functions and formulas for:

- 1) Information general contains information about company information, information about financial report data. Company information includes the company name, address and city where the company is located. Information on accounting report data includes; cash, accounts receivable, inventories, working capital, debt and fixed assets investment.
- 2) The spreadsheet application for the cash budget contains menus, data relating to cash, both concerning cash inflows and cash outflows, company operational transactions related to cash usage and operational and financial transactions.
- 3) The spreadsheet application for short-term investment and the effect contains the main menu, list of types of short-term investments in the form of securities and other short-

term investments, straight-line methods and effective interest methods.

- 4) The spreadsheet application for accounts receivable management contains the initial menu, the initial data on the amount of accounts receivable owned by the company, how to pay and how to pay from customers, receivables 1, receivables 2 and summary scenarios along with the collection of receivables.
- 5) The spreadsheet application for inventory management contains the main menu, inventory calculation with Economic Order Quantity by considering material requirements, order costs and storage costs, reorder points that indicate when the order must have been made and the amount of safety supplies to avoid running out of supply when delays in the availability of supplies ordered.
- 6) The spreadsheet application for fixed asset management contains the initial menu, cases in fixed asset investment, project investment data A, project investment data B and comparison of the calculation of an A project investment assessment with project B, using the average rate of return calculation method and cash flow method which consists of a payback period or time needed for return on investment, net present value, profitability index, internal rate of return.
- 7) The spreadsheet application for dividends contains the main menu, the case of dividend distribution in a company, the calculation of dividend distribution and dividend distribution.
- 8) Spreadsheet application for management time the value of money contains the main menu, the case of calculating the time value of money, future value 1, future value 2, present value 1, present value 2, the future value of the annuity is not the same, PMT, rate, NPER, IPMT AND PPMT.
- 9) Spreadsheet application for earnings balance management-dividends contain the main menu, dividend and dividend distribution cases 1
- 10) The spreadsheet application for financial ratio analysis contains the initial menu, financial report data, the results of ratio analysis involving liquidity ratios, debt ratios, activity ratios and profit ratios, du Pont systems and common sizes.
- 11) The spreadsheet application for Break event point (BEP) contains the initial menu, the initial data is the break event point calculation scenario which is a breakdown of variable costs and fixed costs incurred by the company and the results of the break event point calculation scenario.
- 12) The spreadsheet application for financial optimization contains menus, initial data on financial optimization, initial master calculations, financial optimization calculations and answer report.

C. *Test Draft Spreadsheet-based Applications for Financial Management*

- 1) Trial Design Validation was carried out by experts by filling out instruments in the form of questionnaires and advising on product development. After analysis and revision, the user test is then carried out consisting of tests of students, lecturers, and practitioners' tests.
- 2) Try Out Subjects, the subjects of the trials in this study were expert groups and users. User groups are divided into internal users (students and lecturers), and external users (practitioners). The trial subjects consisted of 10 experts, 2 lecturers, 50 students, and 25 practitioners.
- 3) In instruments are trial, spreadsheet-based application for financial management by experts including aspects of technical performance and operational performance. Technical performance includes: 1) hardware capabilities and operating systems supporting applications; 2) simplicity and ease of use. Operational performance includes: 1) Appropriateness of the application with user capabilities; 2) the ability of the application to produce information; 3) control of the application.
- 4) Trial Data, Data obtained in the form of quantitative and qualitative data, obtained from primary sources and secondary sources. This type of data, data collection methods and instruments used in the development of the first year can be seen in Table 1 and 2.
- 5) Data Analysis, qualitative data were analyzed using descriptive qualitative analysis techniques, while quantitative data analyzed using the percentage analysis technique that is by comparing the number of answers in 1 (one) item with the number of ideal answers in 1 (one) item.

Based on the tests that have been conducted, spreadsheet-based applications for financial management learning have met the technical and operational eligibility requirements. The test results show that spreadsheet-based applications have given the same results as the manual calculation results.

IV. CONCLUSION

The spreadsheet application for financial management consists of: a *spreadsheet* application for financial ratio analysis; *spreadsheet* application for management time *value of money*; *spreadsheet* application for cash management; spreadsheet application for accounts receivable management; spreadsheet application for inventory management; spreadsheet application for long-term investment management; spreadsheet application for fixed asset management; spreadsheet application for liability management; spreadsheet application for equity management. Based on the tests that have been conducted, spreadsheet-based applications for financial management learning have met the technical and operational eligibility requirements. The test results show that spreadsheet-based applications have given the same results as the manual calculation results. The

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