

Developing Accounting Learning Devices for Higher Education Through Problem-Based Learning Approach

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doi: <https://doi.org/10.37745/ijeld.2013/vol12n12637>

Published January 09 2024

Citation: Turi L.O., Dunifa L., and Pracita S. (2024) Developing Accounting Learning Devices for Higher Education Through Problem-Based Learning Approach, *International Journal of Education, Learning and Development*, Vol. 12, No.1, pp.26-37

ABSTRACT: *This research aims to produce a valid design of accounting learning devices in form of lesson plans and student' worksheets on recording material (general journals, ledgers, and trial balances). To achieve the goal, the Plomp Model research and development was applied. The model consists of 5 phases: initial investigation; designing; realization/construction; testing, evaluation, and revision. The research took place at Universitas Sembilanbelas November, Indonesia. The research subjects were students of the first-year of accounting study program, accounting lecturers, as well as learning devices documents. The data were collected through interviews, documentation, questionnaires, and observation. Data analysis was carried out descriptively-qualitatively. The research results showed: (1) the validation of the lesson plan designed was stated to be 83.98% with the category totally valid and feasible; (2) validation of the steps in accounting learning activities amounting to 81.85% with the category totally valid and suitable for use; (3) validation of student' woksheets amounting to 85.31% with the category totally valid and suitable for use. It can be determined that the developed learning devices are feasible to apply. The implication of this research is that students become more active and effective because this accounting learning devices are more student-centered.*

KEYWORDS: learning devices, accounting, problem-based learning model

INTRODUCTION

Education pathways in Indonesia consist of formal, informal and non-formal, which enrich and complement each other. Formal education levels consist of basic education, secondary education and higher education. Indonesian National higher education standards are regulated in Indonesian Ministry of Education Decree Number 3 Year 2020 article 14 paragraph (2) and (3) that state that the learning process through curricular activities must use effective learning methods according

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to the characteristics of the course to achieve the abilities that have been determined in fulfillment graduate learning outcomes (GLO), while the methods that can be used are group discussions, simulations, case studies, collaborative learning, cooperative learning, project-based learning, problem-based learning or other effective student-centred methods or student centered learning (SCR) in order to facilitate the fulfillment of GLO. Meanwhile, the learning process that is generally found today is teacher-centered learning.

Based on the Indonesian Ministry of Education Decree Number 65 Year 2013 concerning basic and secondary education process standards, learning planning is designed in the form of a syllabus and lesson plan which refers to content standards. Learning planning includes preparing learning implementation plans, learning assessment tools, preparing learning media and resources, and learning scenarios. The preparation of the syllabus and lesson plans is adjusted to the learning approach applied. In improving the quality and quality of education, accounting is one of the important subjects to study. Therefore, before starting the learning process, the lecturer's main task is to prepare learning plans such as syllabus, lesson plans, and student worksheets and develop teaching materials in accordance with the curriculum.

Learning tools are a collection of media or tools used by teachers and students in the learning process in the classroom. Learning tools are a number of tools, materials, media, instructions and guidelines that will be used in the learning process (Cahyani, 2014). Preparing tools such as syllabus, lesson plans, worksheets, books and evaluation tools is the initial stage in learning. Therefore, the quality of the devices used also determines the quality of learning. To produce good quality tools, learning tools must be prepared carefully (Tanjung & Nababan, 2018). A syllabus is a learning plan for a particular group of subjects which includes competency standards, basic competencies, main material, learning activities, indicators of competency achievement, assessment, allocation of time and learning resources (Sholeh, 2007). The syllabus is created based on core competencies and basic competencies published by the Directorate of Vocational High School Development which are then developed by teachers both individually and in groups. Meanwhile, a lesson plan is a learning design implemented by teachers in classroom learning (Sholeh, 2007). Lesson plans are developed by teachers based on the syllabus that has been created. A lesson plan should at least contain several things, namely: subject identity, competencies, indicators of competency achievement, learning objectives, learning materials, learning models, learning steps, learning resources, and assessment of learning outcomes (Sulistiyani & Retnawati, 2015; Aji, Hudha & Rismawati, 2017).

Lesson plan is made with the aim of making learning more focused and directed. The planning carried out by a teacher before starting learning is preparing learning tools (Fitri, 2011). Learning tools must continue to be developed so that innovation in learning continues to be available. Learning devices include syllabus, lesson plans and evaluation instruments. Meanwhile, the evaluation instrument includes three aspects, namely cognitive, psychomotor and affective. The evaluation instrument includes at least a grid, questions and assessment rubric. Evaluation focuses

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on students' abilities that can be developed when participating in learning activities and is expected to become a habit for students in everyday life (Listyawati, 2012). Therefore, learning evaluation is an important activity in learning planning.

Problem Based Learning (PBL) is derived from learning theory, namely the process where learners actively construct knowledge (Gijsselaers, 1996). Meanwhile, modern cognitive psychology suggests that learning occurs from learner action, while teachers only facilitate knowledge construction activities by learners and teachers help learners achieve self-directed learning skills. Learners are faced with problem solving situations, problems are prepared as learning stimuli, and teachers only play a role in facilitating the learning process and monitoring the problem solving process.

One model of student-centered learning is PBL (Hansen, 2006). PBL is student-centered learning to develop and train students' higher thinking abilities in decision making (Sulistiyani & Retnawati, 2015). Learning is an effort made to direct students to behave in learning and an effort to teach someone (Farida Jaya, 2019). Teachers play a role in building critical thinking skills and making decisions through the learning activities carried out. However, the focus of attention in successful learning depends on planning in the form of learning tools and good learning management. Meanwhile, PBL also presents learning with complex problems and requires students to develop higher thinking skills (Hansen, 2006; Susanto & Retnawati, 2016; Jailani, Sugiman & Apino, 2017; Ramdiah et. al., 2018) High Order Thinking Skills in Developing Accounting Learning Tools with the PBL Model, (Solikhatun, 2022). PBL is a learning model that actively stimulates and focuses on clinical, community or scientific problems. The main principle in the PBL learning model is a problem, question or puzzle that must be solved by students (Davis & Harden, 1999). PBL functions to bridge the gap that occurs in the classroom and the business world, especially in the field of accounting (Milne & McConnell, 2010). PBL is effectively used to improve students' ability to ask questions, collaborate and solve problems, where the ability to ask questions is a very important ability and is rarely developed in accounting majors (Milne & McConnell, 2010; Stanley & Marsden, 2012). Therefore, the PBL learning model is considered effective enough to be applied in accounting learning (Johnstone & Biggs, 1998; Breton, 1999; Hansen, 2006; Milne & McConnell, 2010; Stanley & Marsden, 2012). With PBL students can learn to manage problems, analyze problems from their perspective, understand problems with previous experience, plan problem solving, solve problems, and look for new sources of knowledge (Wee, 2004; Milne & McConnell, 2010).

The results of the research that has been carried out show that the development of learning tools by lecturers can be used to increase learning activities and outcomes, and can increase lecturer professionalism in the learning process (Sulindawati, 2013). Likewise, the development of learning tools in the form of lesson plans, evaluation tools used with PBL learning to determine higher level thinking abilities and self-confidence have each been tested for validity and feasibility (Solikhatun, 2022). Similarly, the results of research by Rezi and Kinanti (2020) show that

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mathematics learning tools using the PBL Learning Model accompanied by a visual thinking Approach in the form of lesson plans and student worksheets have been tested and are valid.

The learning phenomenon that occurs in the accounting study program at Sembilanbelas November University currently still uses educator-centered learning strategies. Likewise, learning activities starting from planning, implementation and assessment of learning processes and outcomes are still carried out and controlled by the educators themselves, while students act as followers of the activities presented by the educators. Learning tools such as lesson plans have been prepared based on the curriculum, but the model steps and methods used are not clear, the evaluation tools in the lesson plans are also not in sync, lesson plans are not used for one meeting but rather several meetings combined into one meeting. The lesson plan created does not include the benefits of the material studied in everyday life, there is a lack of conformity between the material taught and the basic competencies in the syllabus, it does not include the scope and assessment techniques that will be used, the activities listed are also not specifically detailed (Tanjung & Nababan, 2018). The details of the existing activities are also not in accordance with the syntax of the learning model used, there are no student worksheets available in the learning process. As a result, the quality of the available learning tools is not yet good. This is also supported by the fact that the tools developed by lecturers have never been tested for validity, practicality or effectiveness. In learning, lecturers use teaching materials in the form of students' worksheet that are already available and it is rare for lecturers to design the students' worksheet themselves. From an appearance perspective, the teaching materials used are less attractive because the colors lack variety, even though the colors attract students to read them. The teaching materials used by lecturers are still in the form of material summaries and collections of questions, not student work steps to discover concepts for themselves from the material being studied. So, students are less interested in opening the teaching materials, students prefer to just pay attention to the lecturer's directions without understanding the teaching materials outside of the existing directions.

The teaching and learning process in class shows that students do not want to ask their lecturers even though they actually do not understand the subject matter being taught. The strategies often used by lecturers in teaching are not yet effective, they do not activate students enough, some students still act as spectators, the discussion arena is only controlled by a handful. Therefore, the classroom atmosphere needs to be planned and built in such a way that students have the opportunity to interact with each other, lecturers need to create a learning atmosphere that can encourage students to work together, and innovative and creative learning development is needed that can foster enthusiasm for learning and strengthen students' memory of the material studied. In this way, choosing the right learning model or strategy that is appropriate to the material being taught can support the creation of conducive and enjoyable learning activities.

Accounting is a science that will always be applied in real life in the world of work, so it is certain that graduates are able to think critically in solving accounting problems that occur in the world

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of work. Introduction to Accounting I is a course that can support the above expectations. This course focuses learning on the implementation of the accounting cycle in preparing various financial reports. The accounting cycle is a long process that starts from the beginning of the company's operations in the form of financial transactions, transaction analysis, general/special journals, general ledger, subsidiary ledger, trial balance, adjusting journal, work sheet, financial report, closing journal, balance after closing journal. These working papers are related to one another, so that they end up becoming a financial report. With the complexity of the accounting cycle, it is clear that students' critical thinking skills and abilities are very necessary in solving accounting problems or cases. For this reason, appropriate learning tools are needed, and are oriented towards the development of science and technology in order to improve students' critical thinking skills and abilities in solving various accounting problems. This is in line with what has been stated by Mursyidi (2010) that accounting is the process of identifying financial data, processing and analyzing relevant data to be converted into information that can be used for decision making or can be interpreted as a recording process, classifying, summarizing, reporting, and analyzing an organization's financial data. In developing this learning tool, the accounting material chosen is the accounting cycle, including financial transactions, transaction analysis, general/special journals, ledgers, subsidiary ledgers, trial balances, adjusting journals, work balances, financial reports, closing journals, balance sheets after closing journals.

Based on the description above, the problem formulated in this research is how to develop a design for accounting learning tools in the form of lesson plans, design of accounting learning steps; and design of learning evaluations or student worksheets. This research aims to explore information about the design of developing Accounting learning tools using the problem based learning model which is based on a scientific approach to material from adjustment journals to financial reports regarding the design of lesson plan development, design of accounting learning steps; and design of learning evaluations or student worksheets.

METHOD

The research design used is research and development with a 4D development model, namely the definition, design, development and dissemination stages with the Problem-Based Learning learning model. The steps of development cover: initial investigation phase, designing stage, realization/construction stage, and test, evaluation and revision stage. Initial investigation phase consists of (1) needs analysis and (2) analyzing the problems. Need analysis consists of: (a) reviewing the curriculum; (b) analyze core competencies and basic competencies regarding adjusting journal material and financial reports; (c) compiling material indicators based on core competencies and basic competencies. Analyzing the problems contained in the learning tools in the lesson plan, the steps for learning activities and the existing student worksheets. Designing stage consists of (1) preparing a draft accounting learning tool in the form of a lesson plan, steps for learning activities, and student worksheets; and (2) preparing a draft research instrument,

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namely a validation sheet. Realization/construction stage produces a design for accounting learning tools with a problem based learning model in the form of lesson plans, steps for learning activities and students worksheet. In test, evaluation, and revision stage, the devices that have been developed are then evaluated.

The test subjects in this research were 10 students of first semester of accounting students at USN Kolaka. Research data was obtained from the results of expert validation and student competency tests. After validation, the learning tools will be tested in a limited field. Limited field trials were used to see the level of effectiveness of the learning tools developed.

Techniques of data collection consist of interviews, observation, and documentation. The data were analyzed descriptive-qualitatively. Quantitative data was obtained from validation sheets which were analyzed using descriptive statistics. The validity of learning tools is calculated by counting the level of validity descriptively. Instruments used to measure the validity and feasibility of lesson plans, learning steps and evaluation instruments or student worksheets. The form of product evaluation as a learning resource is validation. Validation was carried out by 3 expert validators, accounting lecturers who were professionally certified. If the product validation results are invalid, revisions are carried out and a revised prototype 1 is produced, then validated and analyzed again. The validation results are said to be valid or require slight revision and produce 2 revised prototypes. The revised product is analyzed to see whether the final evaluated and revised learning device is suitable or not suitable for use. The collected quantitative data is obtained from the validation sheet and analyzed using descriptive statistics (Mean) from the validator results, then the percentage level can be adjusted to the validity criteria table according to (Akbar, 2013) as follows:

Table 2. Validity Criteria

No.	Criteria	Degree of Validity
	80,01% - 100%	Very Valid or can be used without correction
	60,01% - 80.00%	Valid or usable but needs a little improvement
	40,01% - 60.00%	Sufficiently valid or can be used but needs revision
	20,01% - 40.00%	Invalid, it is recommended not to use it because it needs revision
	< 20.00%	Invalid or may not be used

RESULTS AND DISCUSSION

Development Process

The development steps carried out in this research are as follows:

a. Pre investigation step

Initial investigations were conducted through several steps, namely: 1) analyzing needs, namely: (a) reviewing the curriculum; (b) analyzing core competencies (CC) and basic competencies (BC)

Publication of the European Centre for Research Training and Development-UK and the syllabus used in accordance with the curriculum; (c) compiling material indicators based on core competencies and basic competencies. However, the learning models and methods used are still conventional and still lecturer-centred. The analysis focuses on CC, BC, and competency achievement indicators (CAI) for recording cycle material in accounting; 2) analyze the problems contained in the learning tools in the lesson plan, the steps for learning activities and the existing students' worksheet. Based on the results of observations made, there were several students who did not listen and pay attention when the lecturer explained the material in front of the class. So it is necessary to develop learning tools that can increase students' interest in learning.

Data collection was carried out by interviewing lecturers and students, resulting in the fact that in preparing learning tools they still did not use the PBL learning model. So that from the results of the interviews conducted, the researcher created the required learning tools according to needs.

b. Design Stage

The second stage after the initial investigation was designing, which was carried out through several steps, namely: 1) preparing a draft accounting learning tool in the form of a lesson plan, steps for learning activities, and student worksheets; 2) preparing a draft research instrument, namely a validation sheet. The product design that has been created is then validated by selected accounting expert lecturers. The 3 accounting expert lecturers selected from Sembilanbelas November University, Kolaka, Indonesia. The validation result is that the product developed can be used without any revisions. The product designs created include lesson plans, steps for learning activities, and students' worksheet. The tools were made in two meetings with general journal material in accounting at the first meeting and posting material to the ledger and trial balance at the second meeting. Practice questions measure students' level of understanding in each learning activity, while the final evaluation is related to gathering information to determine students' level of understanding of the material that has been taught.

Even though in validation the design of the product being developed can be implemented without any revisions, there are several suggestions that must be fulfilled so that the product being developed can be tested without any shortcomings. The first suggestion is to add practice questions. The second suggestion is the inclusion of a bibliography. When presenting the material, you can use simpler examples, so that students can easily understand the material being presented.

c. Realization/Construction Stage

This stage produces a design for accounting learning tools with a PBL model in the form of lesson plans, learning activity steps and students' worksheet. This product trial was carried out with ten of third semester students. The ten students were selected heterogeneously with different levels of ability. The material is also validated by students, but validation is carried out by means of competency tests. The test that the researcher gave was a test for recording cycle material in accounting. The results obtained from the competency test carried out were that all ten students got a good average score. After product trials were carried out, researchers were still making

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improvements to the learning tools because there were still shortcomings. This deficiency is in the lesson plans and learning steps that are developed because there are several words that are written incorrectly, such as a lack of letters or words that are repeated, so the design of the learning tools is made in an attractive way so that it can motivate students to learn.

d. Test, Evaluation and Revision Stage

The devices that have been developed are then evaluated by 3 lecturers from the Accounting Study Program at Sembilanbelas November Kolaka University, Indonesia. In carrying out process, learning activities applied are student-centered. During the implementation, the students are grouped with ten students in each group. The students have 40 minutes to complete the assignment. At the second meeting, students studied recording material in accounting. After the discussion of the material ends, students are given the task of carrying out a final evaluation. The assessment results obtained showed a very good average of 87.63. The results of the development of accounting learning tools were carried out using the Plomp development model with a PBL learning model called draft I.

2. Design Lesson Plan

Validation results from three validators on the lesson plan developed by researchers with reference to curriculum and syllabus with the following components: course identity, competency standards, basic competencies, achievement indicators, formulation of learning objectives, learning materials, allocation time, learning model, learning steps, learning sources/materials/tools, learning media/tools/materials/resources, and determining the type of assessment.

Table 1. Validation results of lesson plan development judging from observation results

Validation aspect	Percentage of Validation				Criteria
	Validator 1	Validator 2	Validator 3	Validator 4	
Lesson Plan Components	84.5%	90.5%	80.5%	85.17%	Totally valid
Curriculum & Lesson Plan	85.5%	83.5%	81.5%	83.5%	Totally valid
Syllabus & Lesson Plan	89,5%	86.5%	84.5%	86.67%	Totally valid
Learning Objective	87,5%	84.5%	86.5%	86.17%	Totally valid
Modules/Materials	69.9%	84.5%	72.5%	71.12%	Valid
Teaching & Learning Model	84.5%	87.5%	89.5%	87.17%	Totally valid
Instructional Media	81.5%	84.5%	86.5%	84.17%	Totally valid
Language	88.5%	85.5%	86.5%	87.83%	Totally valid
Mean				83.98%	Totally valid

Table 1 shows that of the eight validation aspects observed in the lesson plan, only one aspect has an assessment from the validator with valid criteria. The researcher found that, in the lesson plan being developed, there were several material concepts which according to the validator were not in accordance with the basic competence and the material concepts were still not appropriate, so the researcher made improvements. From the table above it can also be seen that the lesson plan product developed obtained an average result of 83.98%, meaning that the lesson plan steps that

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3. Design Learning Steps

To develop the problem-based learning learning model, a validation test was carried out by 3 accounting lecturers. These steps are assessed based on suitability to learning objectives, suitability to material, suitability to learning steps, learning instructions and suitability of time to the material provided. The results of this validation are presented in the following table.

Table 2. Validation Results of Learning Steps Viewed from Observation Results

Validation aspect	Percentage of Validation				Criteria
	Validator 1	Validator 2	Validator 3	Combination	
a. Opening Lesson	84.5%	90.5%	80.5%	85.17%	Totally valid
b. Problem Orientation	85.5%	83.5%	81.5%	83.5%	Totally valid
c. Organizing Students	89.5%	86.5%	84.5%	86.67%	Totally valid
d. Guidance on Individual & Group activities	87.5%	84.5%	86.5%	86.17%	Totally valid
e. Developing & presenting work results	69.9%	84.5%	72.5%	71.12%	Valid
f. Analyzing & evaluating Problem Solving Problem	84.5%	87.5%	89.5%	87.17%	Valid
g. Closing Lesson	81.5%	84.5%	86.5%	84.17%	Totally valid
Mean				81.85%	

Validation activities are carried out with a validation sheet that has been tested for suitability. Based on the results of the validation of the learning steps, of the eight components of the validation aspect that were observed, two components were declared valid, but overall the average result of the validation of the learning activity steps was 81.85%, meaning that the learning steps had been completed designed to be totally valid and are feasible to implement. The development stage is carried out by validating experts with the aim of ensuring the feasibility and validation of learning tools in terms of material, language and accuracy of application of models, methods and learning media. In this development stage, revisions have been made based on suggestions and input from validators regarding the planned learning tools, then called Draft II.

Design Evaluation of Students' Worksheet

Validation results from three validators on the Students' Worksheet developed by researchers referring to the curriculum and and syllabus with lesson plan components, namely the students' worksheet format, the content presented, and language.

Table 3. Recapitulation of Validation Results of Students' Worksheet Development Judging from Observation Results

Validation aspect	Percentage of Validation				Criteria
	Validator 1	Validator 2	Validator 3	Combination	
a. Students' Worksheet form	84.5%	90.5%	80.5%	85.17%	Totally valid
b. Content	85.0%	83.5%	87.5%	85.33%	Totally valid
c. Material Concept	87.0%	84.5%	88.5%	86.67%	Totally valid
d. Material coverage	82.0%	84.5%	86.5%	84.33%	Totally valid
e. Terminology used	88.0%	85.5%	84.5%	86.00%	Totally valid
f. Material	86.5%	83.5%	82.5%	84.17%	Totally valid
g. Language	82.5%	87.5%	86.5%	85.50%	Totally valid
Mean				85.31%	Totally valid

Based on table 3 above, it appears that of the seven validation aspects observed on the students' worksheet, all of them have an assessment from the validator with totally valid criteria. Results of validation carried out by experts regarding the developed students' worksheet. The feasibility aspect in developing students' worksheet consists of relevance, accuracy, completeness of the presentation, systematic presentation, and suitability of the presentation with student-centred learning demands, method of presentation, suitability of the language with good and correct Indonesian language grammar, as well as readability and communicativeness. The validity results of developing students' worksheet using the PBL learning model are 85.31%, meaning this learning model is very valid and very suitable for application in accounting learning activities.

CONCLUSION

Based on the results of design activities for developing accounting learning tools from the results of this research, it can be concluded that: (1) the design of learning tools created in the form of lesson plans for accounting learning activities is declared totally valid and it can be used without any revisions. This also shows that the design of learning tools in the form of lesson plans is feasible (totally valid), which means that the lesson plan tools that have been prepared reflect the PBL learning model with a focus on students; (2) the activity tools or learning steps that have been designed are declared totally valid with a very feasible category, and this reflects the PBL learning model; (3) the evaluation tools or students' worksheets was also totally valid with the very appropriate category, after being validated by experts and also reflecting the use of the PBL learning model.

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