Development of Project-Based Learning Teaching Materials for the Office Simulation Course in the Office Administration Education Study Program at Universitas Negeri Medan

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Abstract. The expertise exhibited by educators significantly shapes the achievements of students, particularly in today's rapidly changing landscape of technological, informational, and communicational advancements. The Office Administration Education Study Program faces the problem of 21st-century learning challenges, specifically the limited availability of digitally-enhanced learning resources for instructors teaching these subjects. The existing educational resources have become outdated due to the rise of office digitalization in the era of the fourth industrial revolution. Given this situation, it is crucial and important to modernize educational materials. Teaching resources serve as a guide for educators as they teach classes. The goal of this research is to create educational resources for the Office Simulation course, which combines theory and practice, as well as a learning model based on Project Based Learning. The selection of the Office Simulation course stems from its importance in familiarizing students with administrative procedures and concepts in administrative contexts.

Keywords: Teaching Material, Learning Outcomes, Office Simulation.

1 Introduction

The all-digital Industrial Revolution 4.0 poses many challenges in dealing with it, not the least of which is the shift in applied fields of economics such as Accounting and Office Administration. Nowadays, various applications have emerged that can replace employee performance in this field. Facing this, the Indonesian government responded by starting to reduce students in the fields of accounting, commerce and office administration.

Furthermore the government began to encourage additional human resources working in the technical (mechatronics, electronics and robotics) and non-technical (arts, culinary and hospitality) fields. Apart from that, the government also supports the emergence of skills that focus on the uniqueness of a region, for example the establishment of a coffee

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vocational school in Mandailing Natal Regency. In contrast to these conditions, interest in the Office Administration Education study program at Medan State University in particular is still high. This has happened at least at Medan State University, where for several years the Office Administration Education Study Program has had a fairly high number of applicants for the SBMPTN route, amounting to 560 people, while the capacity is 38 people.[1] Based on these facts, a temporary assumption can be made that Office Administration Education There are still big opportunities in the Industrial Revolution 4.0 era, but the challenges faced are quite tough. Therefore, this article attempts to outline the opportunities and challenges of Office Administration Education in the Industrial Revolution 4.0 era.

Lecturers are the spearhead in the implementation of eucation and are the parties who have the most influence in the teaching and learning process. During the learning process in class, an educator must master two things, namely understanding the material and learning strategies. Lecturers are important in learning to determine student success. The success of an education and teaching process at the study program and faculty level can be seen from how effective it is in changing student behavior towards the expected educational goals. To determine the success of students, lecturers have the duty and responsibility to provide education, teaching, guidance, direction, train, assess and evaluate students. Professional teaching staff have a direct influence on student learning outcomes, especially in the 21st century, where developments in technology, information and communication are growing rapidly. This 21st century learning challenge is a problem found in the office administration education study program, namely the lack of teaching materials owned by lecturers to teach these courses. The current learning material still has a manual office administration concept, whereas in the industrial revolution 4.0 era it has now been eroded by the concept of office digitalization. It is feared that this could be one of the impacts of a less up-to-date learning process.

Based on the details provided earlier, there have been positive changes in the way teaching and learning happen in classrooms, particularly regarding the resources used for instruction. Teaching resources serve as a reference for educators during their lessons. This study intends to gather teaching resources for the Office Simulation class, which is also paired with the Case Method and Project Based Learning approach. The choice of the Office Simulation class is important because it focuses on practical office management, where educators require textbooks to teach digital office management in class or in a lab related to office administration. Educators in the office administration program must develop their own instructional materials, taking into account the specific situations and requirements of their students. By utilizing the newest and most applicable teaching resources, classroom instruction can be effectively structured, with the expectation that it will eventually lead to better academic results for students. These academic results should also align with enhancing the quality of teaching provided to students, ensuring that the goal of training future teachers and office administration experts is met.

2 Methodology

This category of investigation falls under the umbrella of Research and Development (R&D). Research and Development constitutes an investigative approach employed for the creation of specific outputs, coupled with assessments of their practical utility.[2] This research methodology incorporates the ADDIE framework, representing the fundamental steps involved in both the creation and enhancement of an educational system,

encompassing 5 (five) distinct phases: (1) Analysis, (2) Design, (3) Development, (4) Implementation, and (5) Evaluation.[3] The rationale behind the selection of the ADDIE framework for this study lies in its structured methodology for educational advancement, which facilitates ongoing assessment and modifications at each step, guaranteeing the creation of a textbook that is both credible and dependable. A visual representation of the ADDIE procedure is provided in Figure 1.

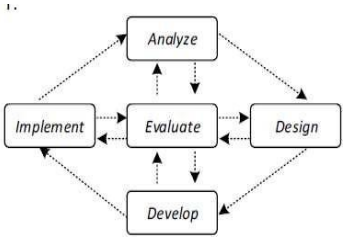

Fig 1. ADDIE Model Stages

The ADDIE model structures research undertakings into distinct phases that can be summarized below:

1. ***Analysis***

   The analysis phase involves the following tasks:

   a. Investigating Performance: This phase identifies and examines challenges present in the educational process.

   b. Analyzing Students: An analysis of student traits, with a focus on their current knowledge and skills, is performed. The purpose of this analysis is to ascertain the capabilities and requirements of students with diverse backgrounds. It can serve as a foundation for deciding the content to be provided in instructional materials and the practical exercises assigned to students.

   c. Examining Instruction: This phase requires gathering information about established learning goals, needed competencies, the overarching goals of the course, graduate profiles, the institution's curriculum, and the institution's defined instructional design.

   d. Analyzing Ideas, Guidelines, and Processes for Educational Content: During this phase, the information within the educational resources is structured according to insights derived from both student and instructional analyses, encompassing both theoretical and practical elements.

2. *Design*

   The following activities are carried out during the design phase:

   a. Creating a Structural Plan for the Book's Content: The structure or content of the book is created using information obtained from the analysis of concepts, guidelines, and processes of learning material. This phase also involves determining the number of learning material chapters to be included in the teaching materials.

   b. Creating Hands-On Student Projects: Student practical projects are created at this point, including the implementation, collection, and methodology stages.

   c. Creating Assessment Tools: In this phase, practice questions that will be added to

the instructional materials are created since student worksheets ought to be included in the materials. Furthermore, assignments for student Case Method and Project Based Learning will also be created in this section.

3. ***Development***

At this stage, the researcher prepares and develops teaching materials according to the specified design, and pays attention to the principles of preparing good textbooks. This stage contains the realization of product design activities, namely teaching materials for the Office Simulation Course.

4. **Implementation**

During this phase, the books that have been put together will be handed out to students enrolled in the office administration education program to assess the textbook's material and how easily it can be understood. The key goals during the implementation phase are: 1) Helping students reach the intended educational results, 2) Making sure problems are solved to deal with challenges students encountered previously when learning, 3) Making sure that students' skills improve by the time they finish learning.

5. Evaluation

The ADDIE model for creating learning experiences concludes with evaluation. The evaluation in this study involves 2 (two) categories: assessing what students have learned and assessing the prepared learning resources. Routine tasks and hands-on projects, given as Case Method and Project Based Learning scenarios, are used to evaluate how well students are learning. Evaluations are also conducted through Mid-Semester Exams (UTS) and Final Semester Exams (UAS). Moreover, a thorough assessment of the teaching materials' whole content is performed to get feedback on how the resources were put together. Following that, changes are made based on the assessment results or any requirements that the teaching materials' development objectives cannot address.

2.1. Data Analysis

The data in this research is quantitative. The data analysis techniques used in research include 3 (three) types, namely Validity, Practicality and Effectiveness:

1. **Validity**

The validation phase is when the teaching resources and research tools that have been developed are assessed for their accuracy.[4] Expert validators conduct the assessment of the legitimacy of instructional resources. Furthermore, validators offer feedback and recommendations on teaching materials and research tools, which serve as a guide for refining products to produce teaching materials appropriate for usage in lectures. A validation sheet is used to evaluate the teaching materials' validity. The Likert Scale is used to measure the outcomes of assessing all aspects.

A psychometric scale often found in questionnaires, the Likert scale comprises assertions about an object that are either favorable or unfavorable.[5] The Likert scale response format includes strongly disagree, disagree, agree, and strongly agree. The responses to the instrument items in this study were divided into five options. A scale score of 1-5 is assigned to each indicator measured, specifically:

Table 1. Teaching Material Validity Indicators

Scale Score	Description
5	very good/ very suitable/ very appropriate/ very clear
4	good/ suitable/ appropriate/ clear
3	less good/less suitable/less appropriate/less clear
2	not good/not suitable/not appropriate/not clear
1	very bad/ very unsuitable/ very inappropriate/ very unclear

After the validity instrument has been submitted to the validator, the next step is to evaluate the appropriateness of the developed teaching materials. The validity score can then be calculated using the following formula:

$$Average\ total\ Score = \frac{Total\ Score}{Number\ of\ Respondent}$$

Then, the validity percentage results can be calculated as follows:

$$Validity = \frac{Average\ Total\ Score}{Maximal\ Value} \text{ x } 100\%$$

Validity categories are based on the following criteria:

Table 2. Product Validity Criterias

No	Score in %	Validity Category
1	0 – 21 %	Un valid
2	21 – 40 %	Less Valid
3	41 – 60 %	Fairly Valid
4	61 – 80 %	Valid
5	81 – 100 %	Very Valid

2. **Practicality**

A crucial aspect of a research tool is its level of feasibility. Educational resources are considered highly feasible when they are easily used and managed. Created educational resources are considered feasible when specialists and those working in the field confirm that these resources are theoretically appropriate for use in real-world settings and can be well implemented. Feasibility assessments can be conducted using two primary methods: evaluating feasibility based on the perspective of facilitators (instructors) (learners) and evaluating feasibility from the learners' (students') viewpoint. The assessment of feasibility from an instructor's point of view helps determine their views on and appraisal of how the educational materials are used and how easily they can be incorporated into lectures. To assess feasibility from the students' perspective, a questionnaire is designed based on specific aspects related to how the educational materials are used. For this research, feasibility was assessed through evaluations completed by the students involved in the study. The information gathered from the questionnaires was analyzed using the Likert Scale method, as detailed in Table 3.

Table 3. Criteria for Scoring Practical Answers

Scale	Description
5	Strongly Agree
4	Agree
3	Less Agree
2	Disagree
1	Strongly Disagree

The analysis of product practicality based on questionnaire data can be conducted using the following formula:

$$Practicality = \frac{Total\ Score\ Obtained}{Maximal\ Score} \text{ x } 100\%$$

After obtaining the practicality value, the results can be described based on the following criteria:

Table 4. Practicality Rating Criteria

No	Score in %	Practically Category
1	0 - 21 %	Unpractical
2	21 – 40 %	Less Practical
3	41 – 60 %	Quite Practical
4	61 – 80 %	Practical
5	81 – 100 %	Very Practical

3. **Effectiveness**

The concept of effectiveness pertains to the consequences generated by a specific action; in this context, it signifies the influence of employing instructional resources in the Office Simulation Course on the resulting learning achievements.[6] Assessing effectiveness serves as a means to gauge the degree to which a learning process attains its intended goals. The effectiveness of Office Simulation instructional materials is demonstrable if they yield a positive impact on the academic performance of students. The term "effective" implies consequence, impact, outcome, or the capacity to produce results. To ascertain the effectiveness of these educational resources, a preliminary assessment will be executed involving small, focused groups utilizing a pre- and post-test (one-on-one) experimental framework, employing a paired sample t-test. The evaluation of the efficacy of learning tools was implemented on a small cohort of 10 students who had successfully finished the Office Simulation curriculum. This experimental design, employing pre- and post-testing, evaluates the impact of instructional resources on academic results by comparing performance levels before and after the application of these materials. This assessment employs a paired sample t-test, predicated on the following hypothesis:

Ho: There is no discernible variation in academic performance levels before and after the incorporation of Office Simulation instructional

resources.

Ha: There are discernible variations in academic performance levels before and after the incorporation of Office Simulation instructional resources.

The acceptance threshold for Ho is defined as a Significance (Sig) value > 0.05, whereas rejection of Ho occurs when the Sig value is < 0.05.[7]

3 Results and Discussion

3.1 Research Result

The entire scope of the research endeavor encompasses 5 phases, specifically Examination, Planning, Construction, Execution, and Assessment. The outcomes of this study are detailed in the following manner:

1. **Analysis**
   The examination undertaken, specifically a review of the curriculum, represents a measure to ascertain the curriculum in practice at the institution, namely Medan State University, and more specifically the Office Administration Education Study Program. The aim of performing this curriculum review is to identify the prerequisites applicable to the curriculum, enabling their alignment with the instructional content. In the tertiary context, the government has put forth the Indonesian National Qualifications Framework (KKNI), as stipulated in Presidential Regulation number 8 from 2012. Consequently, universities, acting as generators of knowledgeable human capital, must guarantee their alumni meet the learning achievements articulated within the KKNI curriculum levels.
2. **Design**
   Learning outcomes should definitely underpin the educational accomplishments of office administration education study program graduates. The envisioned roles for graduates of the office administration study program involve becoming assistant educators in the office administration field, practicing office administration, and engaging in entrepreneurship. During this phase, the content for the Office Simulation book is also developed. Before creating the RPS, course learning outcomes are designed and established initially.
   Based on the Course Learning Outcomes of the Office Simulation, this Project-Based Learning (PBL) Office Simulation teaching book is designed to be written in 12 chapters, consisting of:

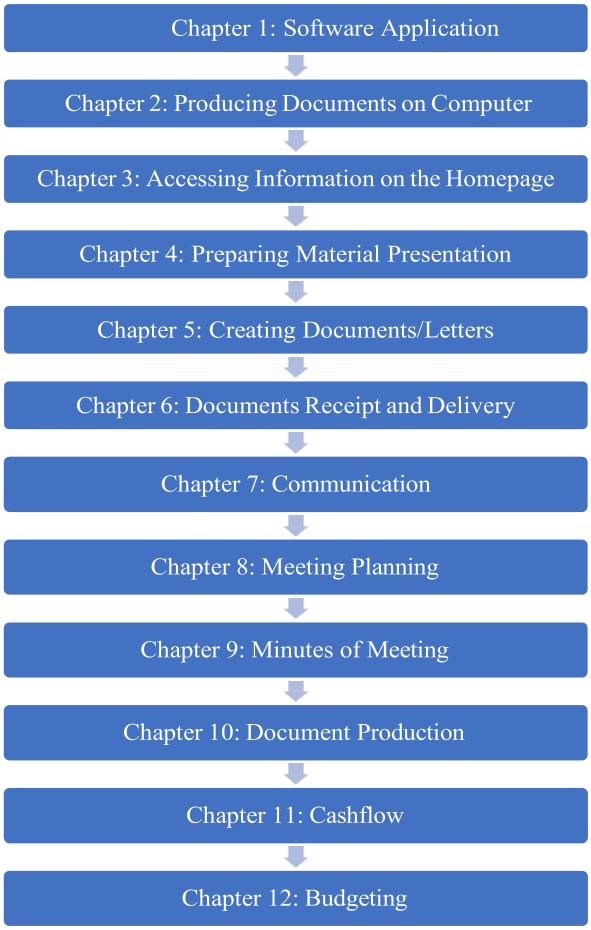

Fig 2. Material Design in the Office Simulation Course Book

3. *Development*

Each section in this publication contains standard activities, which are transformed into group or individual work. Regular activities that are included are centered around project-based learning. Additionally, each section of this book features hands-on exercises. Certain practical exercises are completed during class time, and others are completed outside of the classroom setting. The goal of this strategy is to ensure that practical activities are carried out effectively. Completing practical exercises in class during every session would not be effective because of the constraints of time and available resources. The practical exercises included in this book are also integrated with tasks that adhere to the National Qualifications Framework (KKNI), such as mini-research, team projects, and coming up with new ideas. Practical assignments are similar to Team Projects in specific suitable sections. The same idea applies to doing small-scale research projects. Mini-Research is also included as a practical task.

This method will improve students' productivity. At times, pupils feel overburdened by having too many KKNI tasks. However, this Office Simulation Course Book will alleviate the stress on students by maintaining the curriculum's weight, proportion, and requirements.

4. ***Implementation***

After the creation of the Office Simulation book, the implementation phase was started, specifically focusing on the subject of the research. However, prior to putting the book into practice, it is first examined to see whether it is appropriate. There are three validators involved in performing the Validity Test. The validation value information obtained from the three validators is shown below:
The assessment outcomes from the three experts are detailed below:

Table 5. Validation values from the three validators

Validator	Aspect			Average	Description
	Content	Presentation	Language		
1	89,00	90,66	94,66	91,44	Very Worthy
2	87,00	92,00	94,66	91,22	Very Worthy
3	90,00	93,33	89,33	90,88	Very Worthy
Average	88,66	91,99	92,88	91,18	Very Worthy

Thus, it can be concluded that the Office Simulation book is suitable for application. The validity of each aspect is in the range of 91%-100% as well as the validity of the book as a whole.

5. ***Evaluation***

In carrying out the evaluation, the researcher carried out practical testing of the teaching materials to determine the level of convenience, usability and effectiveness of the book. The research sample, namely Semester VI students of the Office Administration Education Study Program, was used to test practicality. Questionnaires were distributed to students and students to assess books. There are 12 questions consisting of aspects of appropriateness of content (5 questions), presentation (4 questions) and language (3 questions).
The data obtained from the respondents is displayed in Table 6 below:

Table 6. Practicality Value

No	Aspect	Percentage	Description
1	Content	93,40	Very Practical
2	Presentation	88,90	Very Practical
3	Language	91,33	Very Practical
Total		91,21%	Very Practical

Based on this table, it can be seen that the digital-based Office Simulation book has a practical value of 89.71%, which means that this book is very practical to use. In terms of content, the practical score is 93.04%, in terms of presentation, the practical score is 88.05% which is included in the practical category, and in terms of

language presentation it is in the practical category, namely 83.04%.
Apart from testing the practical value, it was also tested again with effectiveness testing. The effectiveness test was carried out to find out whether the application of the Office Simulation Course Book had an effect on student learning outcomes or not. The effectiveness test was carried out using a pretest-posttest experimental design in 3 meetings, namely on the material Introduction to Office Simulation, Telephone Communication, and document handling.

Table 7. Paired Samples Test
Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Pree_test - Post_test	-18.833	3.878	.708	-20.281	-17.385	-26.599	29	.000

Based on the table above, the calculated t value is 26.599 with a significance value of 0.00 < 0.05, so H0 is rejected. Thus, student learning outcomes after using the office simulation book were significantly higher than the student pretest results.

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