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DEVELOPMENT AND IMPLEMENTATION OF POCKETBOOK LEARNING MEDIA IN THE COST BUDGET PLAN SUBJECT AT SMKN 1 TUBAN

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ABSTRACT

This study was motivated by the need for practical learning media to help students understand the technical content of the Cost Budget Plan (RAB) subject in Grade XI of Building Modeling and Information Design (DPIB) at SMK Negeri 1 Tuban . Therefore, this study aimed to develop and implement a pocket book as a learning medium and to determine its feasibility, students' responses, and learning outcomes after its use. This study employed the Research and Development (R&D) method using the ADDIE development model, which consists of Analysis, Design, Development, Implementation, and Evaluation. The research subjects were Grade XI DPIB students at SMK Negeri 1 Tuban , and data were collected through observation, questionnaires, learning outcome tests, as well as validation by material experts and media experts. The results showed that the pocket book learning media was feasible, with a material expert validation score of 88% and a media expert validation score of 81%. Teacher observation results reached 90%, while students' responses achieved 86%, categorized as very good. Students' learning outcomes showed a classical mastery level of 94% students achieving mastery. Thus, the pocket book is effective as a learning medium for the Cost Budget Plan (RAB) subject.

Keywords: Pocket book; Learning media; Cost Budget Plan (RAB); ADDIE; Vocational high school.

INTRODUCTION

Vocational education helps prepare competent human resources ready to compete in the world of work (Oryanti et al., 2022). Vocational High Schools (SMK), as part of vocational education, provide skills-based learning through a combination of theory and practice tailored to the needs of the Business and Industrial World (DUDI). However, vocational high school graduates still face challenges in employment (Nopita et al., 2022). Data from the Central Statistics Agency (2023) shows that vocational high school graduates have the highest open unemployment rate compared to other levels of education. This condition indicates that the learning process in vocational high schools, including the use of learning media, is not fully optimal, so that more effective and adaptive learning media innovations are needed to bridge the gap between learning in schools and the demands of the world of work (Muzzalifa & Oktaviani, 2021).

In the Building Information and Modeling Design Expertise Program (DPIB), one of the subjects that plays a role is the Cost Budget Plan (Ningrum & Dwijayanti, 2021). This subject emphasizes students' abilities in calculating construction work volumes, analyzing unit prices, and compiling building project budget documents (Wartini et al., 2022). These competencies are highly needed when students carry out Field Work Practices (PKL) and when entering the workforce (Paramata et al., 2025). However, in practice, learning the RAB is considered difficult by students (Telaumbanua & Harefa, 2023). These difficulties include understanding the calculation of work area and volume, grouping types of work, determining unit prices, and recording building material prices in the local environment (Fajriana et al., 2022). The learning process is less interesting and tends to be monotonous can reduce students' interest and understanding of the learning material (Sari et al., 2025).

SMK Negeri 1 Tuban as the research location has adequate practice facilities, professional teaching staff, and a representative number of students in the DPIB Expertise Program. Observation results from February to May 2025 showed that RAB learning in grade XI DPIB was still dominated by lecture and practice methods. This approach is less suitable for the characteristics of vocational school students who tend to be visual and active. Problems that emerged included students not being able to prepare RAB documents independently and according to procedures, still making errors in calculating work volumes, and not understanding the order of preparing unit prices. Based on information from the RAB subject teacher, around 25%–30% of students experienced difficulty in understanding RAB material with 9–11 of the total 36 students not achieving optimal understanding. The results of the needs analysis showed that 78.33% of students needed learning media in the form of practical pocket books and supported independent learning.

Pocket books are small printed learning media that present material concisely, systematically, and are equipped with illustrations, making them easy to carry and use anytime (Nurdin et al., 2022). This media is designed with an attractive appearance and simple content presentation to make it easier for students to understand the learning material (Samala et al., 2021). Packaging the material in the form of concise writing and images can increase students' focus and motivation to learn independently (Agustina et al., 2022). Pocket books function as learning aids that present information in a one-way manner but are still able to develop students' understanding of the material being studied (Suranto & Hapsari, 2025.) Pocket books are considered appropriate to the needs and characteristics of vocational high school students who require practical and efficient learning media (Utami et al., 2022).

Research focuses on the development and implementation of learning media in the form of a pocket book on the subject of Budget Planning (RAB) in class XI DPIB SMK Negeri 1 Tuban. Through the development of this learning media, it is hoped that the resulting pocket book is suitable for use as a learning medium and can help improve students' understanding and learning outcomes on the RAB material.

RESEARCH METHODS

Study This use Research and Development (R&D) method with the ADDIE development model. The following channel media development:

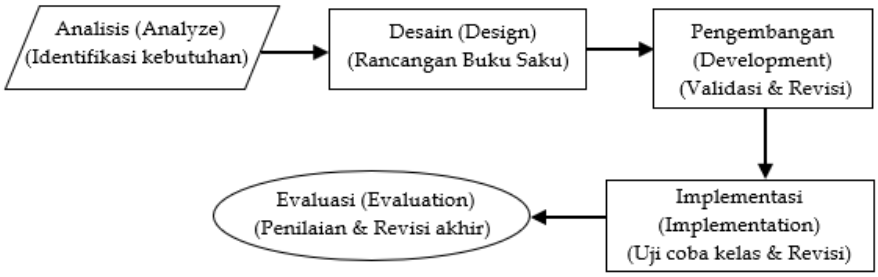

Figure 1. ADDIE Model Learning Media Development Flow

The analysis stage was conducted to identify learning needs, student characteristics, and the suitability of the Cost Budget Plan (RAB) material to the curriculum. The design stage focused on designing the material structure, learning objectives, and the design of the pocket book media. In the development stage, the pocket book media was developed and validated by material and media experts, then revised based on the input provided. The implementation stage was conducted through a limited trial with grade XI DPIB students to obtain student responses and learning outcome data. Next, the evaluation stage was conducted to assess the feasibility of the learning media as a basis for product improvement.

The research subjects involved 36 students of class XI of Building Modeling and Information Design (DPIB) at SMK Negeri 1 Tuban. Students were involved in a limited trial phase to obtain student response data for the use of pocket books through learning outcome tests. Data collection in this study was conducted using several instruments designed according to the needs and objectives of the study. The instruments used included a material expert validation sheet, a media expert validation sheet, a teacher observation sheet, a student response questionnaire, and a learning outcome test. The material expert validation sheet was used to assess the suitability of the content to the curriculum, the accuracy and clarity of the language, the systematic presentation of the material, and the usability of the pocketbook as a learning medium. Meanwhile, the media expert validation sheet was used to evaluate the linguistic aspects, visual appearance, content suitability, and the level of usability of the developed media.

Teacher observation sheets and student response questionnaires were used to obtain data regarding responses to the use of pocket books in Cost Budget Planning (RAB) learning. Teacher observations aimed to assess the implementation of media use in the learning process, while student response questionnaires were used to determine students' perceptions and level of acceptance of the media used. Learning outcome tests were administered to measure students' level of understanding after using the developed learning media.

The data obtained through all research instruments were then analyzed to answer the formulated research objectives. Data analysis techniques included validation results from material experts and media experts, teacher observations, student responses, and student learning outcomes. Data analysis of expert validation, teacher observations, and student responses was conducted using a Likert scale with a uniform assessment procedure. The scores obtained were then converted into percentages to determine media suitability categories and user response levels based on predetermined assessment criteria.

Table 1. Rules Scoring

Score	Criteria
5	Strongly agree
4	Agree
3	Disagree
2	Disagree
1	Strongly Disagree

Table 2. Criteria Evaluation

Score	Criteria
81-100%	Very Worthy
61-80%	Worthy
41-60%	Enough
21-40%	Less than worthy
0-20%	Totally Unworthy

From the results of the Likert scale above, the following is the formula for analyzing the student response questionnaire:

Presentation response students $= \frac{Total\ Score}{Maximume\ score}\ x\ 100\%$

Analysis of student learning outcomes was conducted separately due to the different assessment models used. Learning outcomes were analyzed based on test scores to determine students' level of learning completion. These results were used to assess the feasibility of using pocketbook learning media to improve student learning outcomes.

Table 3. Five-Scale PAP Conversion Guidelines

Presentation	Level of learning outcomes
90 – 100	Very high
80 – 89	Tall
65 – 79	Currently
55 – 64	Low
0 - 54	Very Low

Calculation of learning completeness in a classical way based on learning outcomes using the following formula:

$$KB = \frac{\Sigma TB}{N}\ x\ 100\%$$

Information
KB = Learning completion
ΣTB = Number of students who have completed their studies
N = Total number of students

RESULTS AND DISCUSSION

Pocket Book Development Process for RAB Subjects

Analysis

The Analysis stage was conducted to identify student needs and obstacles faced in learning the Cost Budget Plan (RAB) subject in class XI DPIB SMK Negeri 1 Tuban. Data collection was conducted through classroom observations and interviews with RAB teachers. The analysis results showed that teachers had used media such as projectors, teaching modules, and video tutorials to help students understand building work drawings as the basis for RAB calculations. These media did not fully support independent learning and material repetition for students. These results indicate the need for the development of additional media that are simple, practical, and easy to use, such as pocket books, to increase student interest and understanding of RAB material during the learning process.

Design

The design stage consists of two main focuses, namely content design and pocket book format design:

a) Pocket Book Content Design

The design of the pocketbook's contents focused on determining the structure and sequence of the material to align with the students' core competencies and needs. The design was systematically structured to facilitate understanding and development in subsequent stages. The main sections of the pocketbook include:

a. Cover
   Displays book titles, subjects, classes, school identities, and visual displays according to the context of construction learning.
b. Pocket Book Identity
   Information on author, institution, subject, class, and year of publication.
c. Introduction
   General explanation of RAB material, objectives, and benefits of pocket books as learning tools.
d. List of contents
   Structured to make it easier to find material.
e. Summary of Material
   Summary of the core material, including land clearing work, river stone foundations, and column and sloof reinforcement.
f. Calculation of Work Volume
   Formulas, calculation examples, and simple steps for calculating the volume of construction work.
g. Starting Questions
   Initial questions to encourage students to think critically and connect the material to practice.
h. Glossary
   List of important terms in the RAB along with a brief explanation.
i. Bibliography
   Reference sources used in compiling the material.

b) Pocket Book Format Design

The format design aims to make the media easy to use and comfortable for vocational school students. The format aspects developed include:

a. Size A6 book (10.5 × 15 cm) using 120 gsm glossy art paper.
b. The pages are arranged consistently and sequentially for easy reading.
c. The number of pages is ±30, so the material remains concise.
d. The cover displays the class name and subject clearly.
e. Times New Roman font size 12 pt for readability.

Development

a) Subject Matter Expert Validation

The validation of the material expert was carried out by the Head of the Department of Modeling and Building Information Design, Deby Prismadi K., S.Pd., on November 17, 2025. The assessment aimed to assess the feasibility of the pocketbook material according to the basic competencies of the Cost Budget Plan (RAB) subject. The validation results showed a total score of 70 out of 80, or 88%, so it is included in the very feasible category. This result indicates that the pocketbook material is relevant and in accordance with the competencies that students must master. The material expert provided several minor suggestions, such as adjusting the order of work items and adding size information to the sloof and column reinforcement, which were then implemented to improve the product. The material expert provided several suggestions, such as adjusting the order of work items and adding size information to the sloof and column reinforcement. Based on these suggestions, the pocketbook was revised to be clearer, more systematic, and easier for students to understand.

Figure 2 shows the pocketbook before revision, where the alphabetical order in the sand filling and stamping sections was unclear and each point was not well differentiated. Figure 3 shows the pocketbook after revision, with the alphabetical order corrected according to the material expert's suggestions, making it neater and easier to understand.


a. Pasir Urug

Pasir urug berfungsi menstabilkan permukaan tanah dan meratakan beban agar tersebar merata. Ketebalan urugan pasir berkisar 5–10 cm, disesuaikan dengan kondisi tanah

Gambar 2 Pasir Urug
Sumber : jurnalarsitek

b. Aanstamping

Aanstamping adalah susunan batu kali berdiameter 10–15 cm yang disusun tegak dan rapat tanpa adukan, dengan sela-sela diisi pasir dan dipadatkan hingga tidak ada rongga. Aanstamping berfungsi sebagai lantai kerja serta drainase untuk mengeringkan air tanah di sekitar pondasi.

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Figure 2. The alphabetical order display has not been revised.

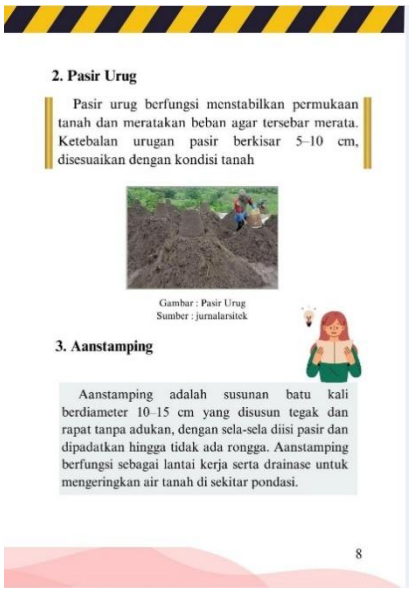
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Figure 3. Display of alphabetical order after revision

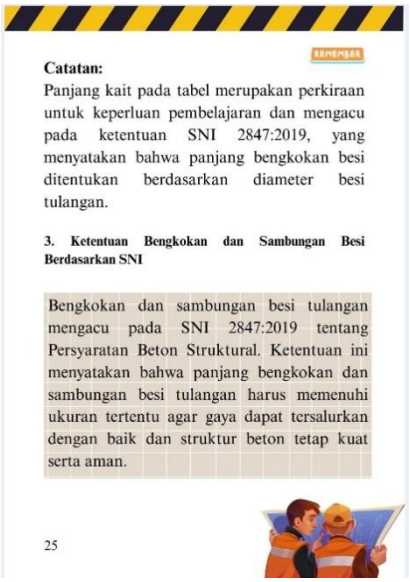
b) Media Expert Validation

Media expert validation was conducted by Dr. Wahyu Dwi Mulyono, S.Pd., M.Pd., on November 10, 2025. The assessment covered aspects of language, material presentation, content suitability, and usefulness with a Likert scale of 1–5. The validation results showed a total score of 65 out of 80, or 81%, including the very appropriate category. These results indicate that the pocket book has met the standards of appearance, media presentation, and design that are suitable for use in learning.

The media expert provided several suggestions for improvement, including ensuring the calculation symbols and appropriateness of the sizes used in the pocketbook, improving the cover to include the target class with the author's name in the correct position, and adding a new page containing the Indonesian National Standard (SNI) for iron to support the calculation material. Figure 4 shows the pocketbook cover before the revision, where the target class was not written and the author's name was in the wrong position. Figure 5 shows the pocketbook cover after the revision, which has been improved according to the media expert's suggestions so that the appearance is clearer and more professional. Figure 6 displays an additional page containing the SNI for iron, as a form of improving the pocketbook content to be more complete and in accordance with the needs of RAB learning.

Figure 4. Pocket book cover before revision

Figure 5. Pocket book cover after revision


REMEMBER

Catatan:

Panjang kait pada tabel merupakan perkiraan untuk keperluan pembelajaran dan mengacu pada ketentuan SNI 2847:2019, yang menyatakan bahwa panjang bengkokan besi ditentukan berdasarkan diameter besi tulangan.

3. Ketentuan Bengkokan dan Sambungan Besi Berdasarkan SNI

Bengkokan dan sambungan besi tulangan mengacu pada SNI 2847:2019 tentang Persyaratan Beton Struktural. Ketentuan ini menyatakan bahwa panjang bengkokan dan sambungan besi tulangan harus memenuhi ukuran tertentu agar gaya dapat tersalurkan dengan baik dan struktur beton tetap kuat serta aman.

25

Figure 6. Additional page containing SNI iron

c) Teacher Observation

After validation, the pocketbook was implemented in learning for class XI DPIB, and teacher observations were conducted to assess the media's suitability from the perspective of direct users. The observation results showed a total score of 270 out of 300, or 90%, with a very suitable category, indicating that the pocketbook is suitable for use as a supporting medium for RAB learning. This observation confirmed that the pocketbook has met the aspects of appearance, systematic presentation, and usefulness for the teaching and learning process.

Based on the validation and observation results, the developed pocket book is suitable for use, effectively supports understanding of the RAB material and suggestions from experts have been implemented to improve the quality of the media.

Implementation

The implementation phase was carried out to implement the pocketbook that had been developed and revised based on the validation results (Bakti et al., 2022) . The purpose of this phase was to determine the use of the pocketbook in learning activities and students' initial responses to the learning media. The implementation was carried out on grade XI students of Building Modeling and Information Design (DPIB) at SMK Negeri 1 Tuban, covering two classes with the same procedure. Each activity began with an explanation of the Cost Budget Plan (RAB) material and a guide to using the pocketbook. Students then used the pocketbook as a learning medium throughout the learning process.

At the end of each session, students were given practice questions to assess their understanding of the material. Furthermore, student response data was collected through a questionnaire to assess the level of acceptance and usefulness of the pocketbook. This implementation ensured optimal use of the pocketbook and provided baseline information on the media's effectiveness in supporting learning.

Evaluation

The evaluation stage is the final stage in the ADDIE development model, which aims to assess the suitability of the pocketbook as a learning medium (Jannah & Hasanah, 2021) . This evaluation is conducted to obtain an overview of the usefulness of the pocketbook in supporting students' learning processes. The evaluation focuses on two main aspects: student learning outcomes and student responses to the use of the media. Learning outcome data is collected through practice questions, while student response data is obtained through questionnaires. The evaluation results serve as the basis for assessing the quality of the pocketbook.

Table 4. Summary of Student Learning Outcomes

Students Complete	34
Students Not Finished	2
Classical Graduation Percentage	94%

Data were collected through practice questions given to students after the learning activities were completed. Students were deemed to have completed the course **if** they obtained a score of 80 or higher, while those who obtained a score below this criterion were categorized as having not completed the course**.** The evaluation phase also measured student responses to the use of the pocketbook. Student response data was obtained through a questionnaire that assessed several aspects, namely language, appearance, content suitability, and media usability.

Table 5. Student Response Results

No	Aspect	Maksimum Score	Score Earned	Percentage
1	Language	540	494	91%
2	Appearance	720	672	93%
3	Content Suitability	540	457	85%
4	Expediency	2700	2269	84%
	Total	**4500**	**3892**	**86%**

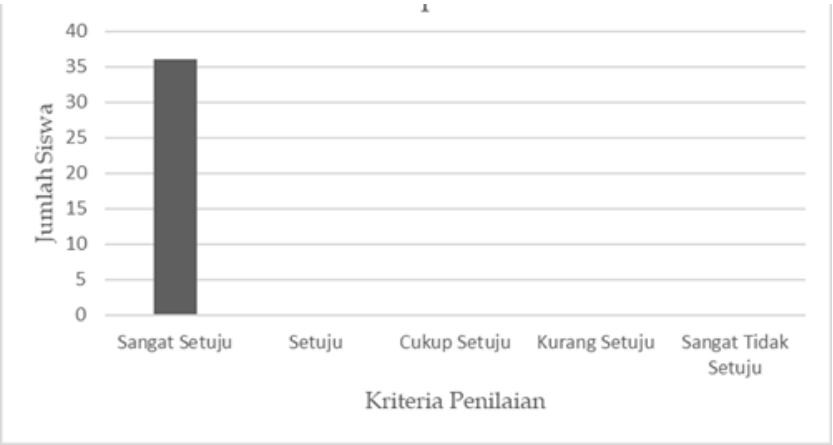


Figure 7. Student Response Results Diagram

Figure 7 presents the results of student responses after using the pocketbook learning media, showing that 36 students gave an assessment with the criteria of "Very Appropriate". This category indicates that the learning media in the form of a pocketbook was well received by students and is useful as a supporting learning medium in helping to understand the Cost Budget Plan (RAB) material. The analysis results show that all students gave a positive response to the pocketbook. Of the total maximum score of 125, the score obtained shows the category of "Very Appropriate", indicating that the pocketbook was well received by students and provided real benefits as a learning medium. The percentage breakdown per aspect is: language 91%, appearance 93%, content suitability 85%, and usefulness 84%, with an overall average of 86%. The high scores in the language and appearance aspects indicate that the pocketbook is easy to understand and interesting, while the content suitability and usefulness confirm that this media is relevant to learning needs and effective in supporting understanding of the RAB material. These results indicate that pocketbooks not only increase student interest and learning comfort but can also be used as an effective and appropriate learning medium.

These results are in line with the stimulus-response theory proposed by Skinner (1953) in Widiyanti et al., (2024), which states that individual behavior emerges in response to stimuli from the environment. The results of this study indicate that pocket books function as a stimulus, while students' responses to the media become responses that illustrate students' active involvement in the learning process. Research by Puspita & Amelia (2025) shows that pocket books are considered practical and suitable for use with a very good category. Pocket book media received very positive responses from students and was included in the "very suitable" category. Pocket books are not only easy to understand and use, but also provide a real contribution in helping students understand the RAB material more optimally. Pocket books are suitable as supporting learning media that are effective and enjoyable for students.

Students are considered to have completed the course if they obtain a score of ≥ 80. The analysis results show that out of 36 students, 34 students achieved the completion criteria, resulting in a classical learning completion rate of 94%. These results indicate that the majority of students were able to understand the RAB material well and that the use of the pocketbook was effective in supporting the learning process. These results indicate that the use of pocket books as learning media helps students understand the Cost Budget Plan (RAB) material more clearly, structured, and directed. The concise, well-organized, and easy-to-read presentation of the material makes students more interested, focused, and enthusiastic in participating in the lesson, thus creating a more effective learning process. Pocket books support students' independent learning both inside and outside the classroom, thus facilitating material comprehension and assignment completion.

The research results are in line with Piaget's constructivism theory (1973) in Aisyah et al., (2025) which states that learning outcomes are obtained through the active involvement of students in building understanding based on learning experiences. In this case, students play an active role in understanding and linking the material with existing knowledge, so that the learning outcomes achieved reflect meaningful understanding as an indicator of learning success. Research by Nurani et al., (2025) shows that the use of pocket books in learning has a positive impact on student motivation and learning outcomes.

CONCLUSIONS

Based on the research results, it can be concluded that the development shows that the pocketbook learning media is declared very feasible to use and has met the eligibility criteria as a supporting media for RAB learning. Student responses to the use of the pocketbook learning media show a very feasible response. This media is well received by students, easy to understand, has an attractive appearance, and provides real benefits in supporting the learning process of the RAB subject. Student learning outcomes after using the pocketbook learning media show a significant increase, marked by the achievement of learning completeness. This study shows that pocketbooks are effective in helping students understand the Cost Budget Plan material more clearly and support the achievement of optimal learning outcomes.

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