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## Interactive Smart Book Design Based on Augmented Reality with Constructivism Approach in Introduction to Management Course

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### ABSTRACT

In Indonesia, there are no augmented reality-based management economics textbooks yet, most of them are still ordinary printed management economics books. In the previous introductory management course book, it was still a regular printed book, there was no touch of augmented reality technology so that the product of the introductory management course was still simple, then after conducting interviews with the lecturers of the introductory management course, an interactive smartbook based on augmented reality with a constructivist approach will be developed in the introductory management course using the ADDIE model, The research method uses the ADDIE model which is implemented holistically from the analysis, design, development, implementation and evaluation stages, and has been assessed by the validation of learning media experts by 98% and learning material experts by 87.5%, then an interesting introductory management book was produced with its augmented reality and was accepted by students with an assessment score of 92.75% meaning that this interactive smartbook product is very suitable for use in introductory management learning.

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## Introduction

The learning conditions in the introductory management course of the D4 tax accounting study program at STEKOM Semarang University only use textbooks provided by lecturers, learning media in the form of textbooks that are able to display three-dimensional objects and make students more interested and understand studying the introductory management course, with the presence of augmented reality in the introductory management textbook, it is hoped that the learning outcomes and learning motivation of STEKOM University students will be better. Based on the current learning conditions in introductory management courses, innovation is required in learning by creating an introductory management smartbook application product that is suitable for use at STEKOM University and campuses outside STEKOM that teach introductory management courses. Many studies have been conducted at home and abroad related to the development of AR Books that make augmented reality a child-friendly technology and can become a learning

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trend in elementary education (Kesim & Ozarslan, 2012; Özdemir, 2017), then with augmented reality it is very effective for recognizing letters and numbers in introducing them to PAUD children (Setyosari, 2016), then with augmented reality, students have an exciting experience in understanding a material (Rambli et al., 2013), from various findings in the background, it is formulated: (1) how to create an augmented reality-based smartbook media that is suitable for use in learning introductory management courses? (2) how effective is the use of an augmented reality-based smartbook media application as a supplement to introductory management courses

## Research Methods

In this development research, interactive smartbook media has been developed with a constructivist approach based on augmented reality in introductory management courses, using the ADDIE model which goes through five stages, namely (1) Analyze, (2) Design, (3) Development, (4) Implementation, (5) Evaluation (Setyosari, 2016).

## Findings

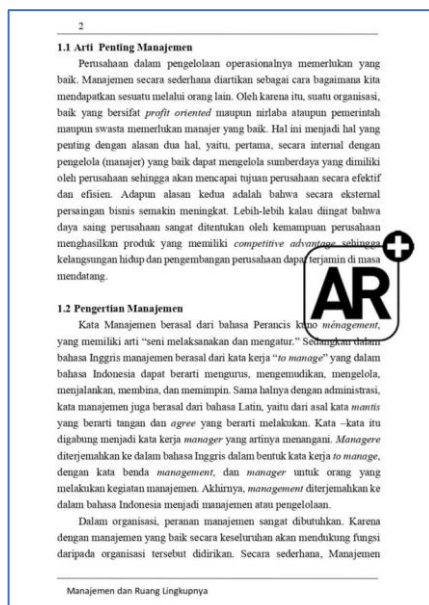
In carrying out the first step, namely the analysis stage, the analysis was carried out by interviewing four lecturers of introductory management courses at STEKOM University which showed that introductory management textbooks were still being used, which were made by lecturers for internal circles only and there was no touch of technology in making introductory management teaching materials, this, therefore, innovation in introductory management textbooks is needed that can attract students in learning by the development of the times, one of the interesting technologies and introductory management textbooks, using augmented reality which can display augmented reality in each of its materials, so far introductory management textbooks, are only ordinary textbooks and a touch of the constructivist model that has been included in the introductory management course textbooks (smartbooks) at STEKOM University.



**Figure 1.** Needs analysis in making interactive smartbook based on AR

The second step is the design stage, in designing an interactive smartbook product based on Augmented Reality with a constructivist model, it is carried out together with lecturers of

introductory management courses at STEKOM Semarang University and the research team to design a textbook adjusted to the KKNI and OBE curriculum, then each chapter is given a touch of augmented reality so that it is interesting with its added reality, then associated with the constructivist model to make students' understanding of introductory management material deeper, then at the end of the material questions are given to hone students' knowledge of introductory management material with a total of eight chapters discussed in this introductory management course smartbook textbook, the following is a sample of an introductory management course smartbook product that is associated with augmented reality and the constructivist model.



**Figure 2.** Implementation of AR in each chapter of the introductory management course

In each chapter, an AR barcode is given which must first be installed with the AR application for introductory management on the student's smartphone or iPhone, then the students try to use this introductory management smartbook application in trying out augmented reality on the AR marker in each chapter, with the augmented reality in the form of a video explaining the introductory management material, students can learn independently anytime and anywhere based on Android or iOS. Then in the application of the constructivist model, it is associated with the phenomenon of management in Indonesia which is actual and factual.

The third step is Development, in this step we have developed an interactive smartbook product for introductory management based on augmented reality combined with the constructivist model, after the interactive smartbook product for introductory management is finished, an FGD (Focus Group Discussion) is carried out to validate the interactive smartbook product for introductory management based on augmented reality. The FGD was conducted for a full day by inviting reliable lecturers of introductory management and IT lecturers from STEKOM Semarang University and PGRI Semarang University. The results of the FGD showed that the interactive smartbook product of introductory management is

suitable for use as a supplement to teaching media for introductory management lecturers at their respective universities with slight revisions, namely:

1. Improvements need to be made to the sensitivity of the AR marker in each material, so that the video loading process in the AR marker is quickly detected and easy to play
2. The augmented reality in this AR-based interactive smartbook already represents the introductory management material in each chapter, but the duration needs to be added
3. Novelty and product specifications need to be clarified in the description of the foreword
4. It is necessary to add Introductory Management Study Materials in the discussion per Material
5. It is necessary to create an interactive AR smartbook Guidebook for introductory management courses with a constructivist model, both printed and digital (External)
6. The draft of the smartbook that has been designed does not describe the constructivist model supported by the Teaching Devices (RPS) in more detail
7. Digital Technology for literacy needs to be strengthened again
8. R&D procedures in produce the design specifications of the interactive smartbook introduction to management described in more detail

After conducting FGD related to the feasibility of this AR-based smartbook product associated with the constructivist approach, improvements will be made immediately and can be applied in 2 campuses in the city of Semarang that have management study programs, the following are the results of the validation response questionnaire from expert judgment experts in the fields of IT and Management:

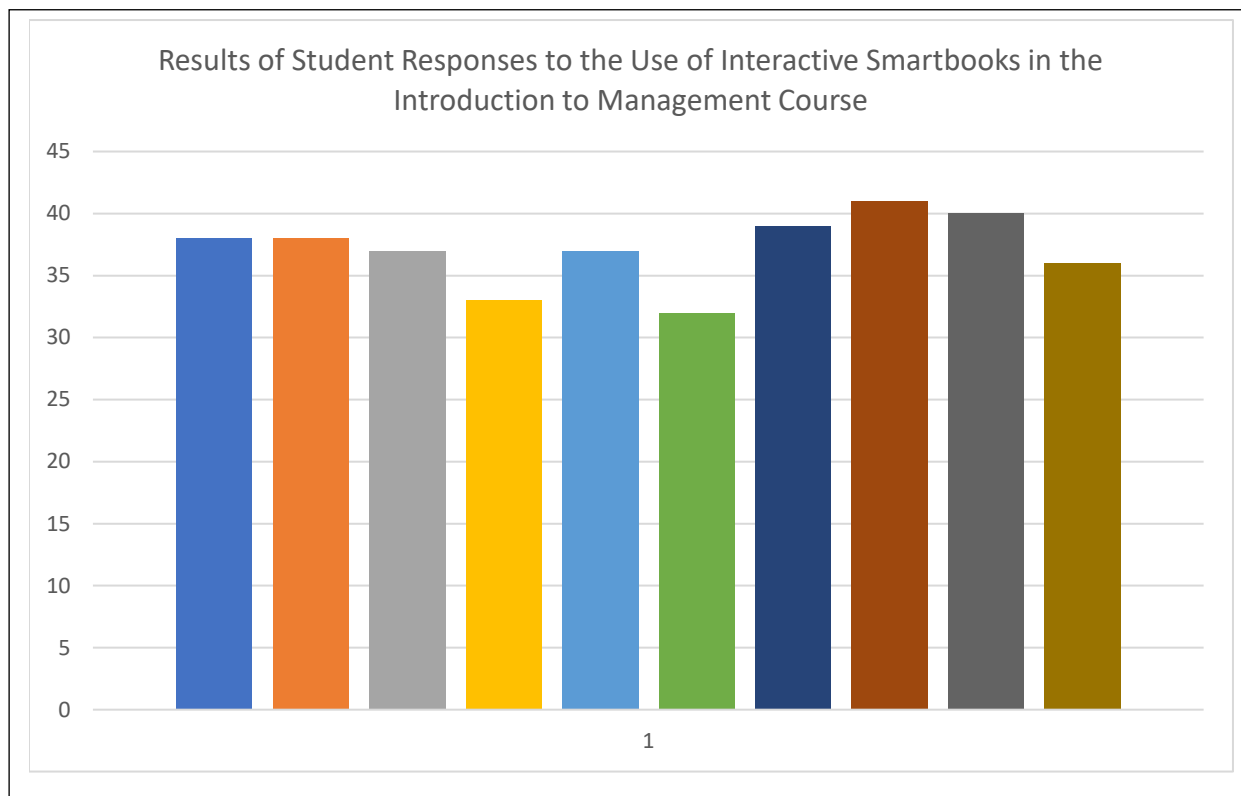
Based on the validation of learning media experts (1) Media appeal, (2) Media design quality, (3) Quality of materials used, (4) Suitability of design to the Interactive Smartbooks in the Introduction to Management Course concept, (5) Use of AR Book user manual, (6) Motivational quality, who are experts in the field of IT about interactive smartbook products with a constructivist approach in introductory management courses, it shows that 98% of interactive smartbook design products with a constructivist approach in introductory management courses are very feasible to use in lectures.

Then continued validation of material experts related to introductory management course materials obtained the following results: Based on the validation of learning material experts who are experts in the field of management regarding the depth of interactive smartbook product material with a constructivist approach in introductory management courses, it shows that 87.5% of the material in interactive smartbooks with a constructivist approach in introductory management courses is very suitable for use in lectures.

The fourth step is Implementation, at this implementation stage an initial introduction has been carried out at the STEKOM Semarang University campus and now it has entered the second lecture, all students of this introductory management course are required to install this AR-based interactive smartbook product on all student smartphones, then students try

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to use the AR-based interactive smartbook product in understanding introductory management material and other materials holistically and continuously. Based on the results of the student response questionnaire in using the interactive smartbook product in the AR-based introductory management course, the following results were obtained:



**Figure 3.** Results of Student Responses to the Use of Interactive Smartbooks in the Introduction to Management Course

### Discussion

The obstacle in this study is that not all students' smartphones support this AR application because special RAM is needed so that augmented reality appears on each student's smartphone. It is better for researchers to prepare smartphones that support this study.

The next step will be to register the ISBN for interactive smartbook in the introductory management course and will carry out an evaluation stage for the use of interactive smartbooks in the introductory management course at STEKOM University and at the PGRI Semarang University management study program.

The results of expert validation show that this augmented reality-based interactive smartbook product is feasible for use in introductory management course learning, this is in accordance with previous research that with AR in alphabet learning makes preschool

students very enthusiastic about following learning (Rambli et al., 2013), then strengthened by other research which shows that augmented reality can increase students' knowledge in learning electronics (Kraut & Jeknić, 2015).

Then in introductory management learning, it has been based on research from researchers who have developed e-books with flipbookmaker software for learning financial accounting courses at STEKOM Semarang, the results of which are that students are very enthusiastic when lecturers are able to package financial accounting teaching materials in the form of interesting e-books in class (Kholifah et al., 2017), then with Webquest technology, Statistics Courses with a Constructivist Approach can improve the ability to construct material by STEKOM Semarang students (Kholifah et al., 2019), then the design of this interactive smartbook for introductory management courses is also in accordance with the Augmented Reality-Based English Learning Smart-Book application which has attracted students to learn English even more enthusiastically (Susanto et al., 2022), then this interactive smartbook research has produced a feasibility study so that it is worthy of competing in the market, this is in accordance with development of a digital book on macroeconomics that is suitable for use as a supplement to lectures (Muslim et al., 2021), in the Development of Smart Book Learning Media, it is able to Improve Elementary School Students' Understanding in Science Learning with an increase in literacy understanding reaching 60 percent (Hardiansyah et al., 2023), with a new framework making smart books easier to create using digital twins technology (Kolivand et al., 2020), then AI-Based Smart Books are able to Improve Arabic Language Education in Palestine with Augmented Reality up to an increase percentage of 80 percent (Rajab et al., 2023).

## **Conclusion**

Interactive smartbook based on augmented reality with a constructivist approach after developed in the introductory management course using the ADDIE model and has been assessed by the validation of learning media experts by 98% and learning material experts by 87.5%, then an interesting introductory management book was produced with its augmented reality and was accepted by students with an assessment score of 92.75% meaning that this interactive smartbook product is very suitable for use in introductory management learning

## **Acknowledgment (optional)**

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