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Development of an Interactive Multimedia-Based IIMSE Learning Model: Accounting Learning

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ABSTRACT

The purpose of this study is to ascertain whether the interactive multimedia-based IIMSE learning paradigm is feasible and beneficial for teaching accounting to students in class XI at Budisatrya Private Vocational School in Medan. This kind of research uses the ASSURE model in conjunction with R&D product creation. Based on the validation of learning material experts (86.4%), learning design experts (88.1%), and media experts (90.6%), who all fall into the very feasible category, the research's findings indicate that the interactive multimedia-based IIMSE learning model is appropriate for use. Field trials came in at 85.6%, small group trials came in at 81.7%, and individual trials came in at 77.1%, all falling into the extremely feasible category. The hypothesis submission results demonstrate that the interactive multimedia-based IIMSE learning model is appropriate for use in accounting courses and that the learning outcomes of students treated with the interactive multimedia-based IIMSE learning model differ significantly from those of students treated with the conventional learning model. This is demonstrated by the data processing findings, which show that tcount > ttable (5.63>1.63) at the significance level α = 0.05 with df obtained t table = 50. We can conclude that there are disparities in the learning results before and after therapy, with Ho being rejected and Ha being accepted. As a result, student learning outcomes are improved by the IIMSE learning paradigm, which is based on interactive multimedia in accounting education.

KEYWORDS

Learning model; IIMSE; interactive multimedia; accountancy

INTRODUCTION

A teacher is essential to be able to demonstrate inventive, creative learning and attract students to active creativity, one of which is using learning models and media as well as conducting appropriate evaluations to achieve learning outcomes. In carrying out learning, attention to environmental needs is crucial because a supportive learning environment can increase the effectiveness of the learning process. In this context, the use of new models and media is very necessary to solve challenges and prepare students to become superior human resources in the current global era.

Based on field observations conducted at the Budisatrya Private Vocational School in the Accounting department, researchers found that the learning carried out by educators resulted in students achieving less than optimal learning outcomes because there were scores below the KKM average, namely 75, as indicated by student data collected from instructors in the Corporate Accounting Practicum subject, Services, Trade, and Manufacturing.

One of the basic competencies in accounting learning for class XI AK is the adjustment journal. In order to reflect the true status of assets, debt, capital, revenue, and expenses, an adjusting journal is one that is used to match account balances in the trial balance to the actual balance until the conclusion of the accounting period (Sujawerni, 2016: 43). Therefore, researchers developed adjusting journal material that requires skills in analyzing, recording, and calculating accounting transaction data so that they can solve problems with adjusting journal entries through examples of interactive problem solving. Through it is believed that by utilizing interactive multimedia and Adobe Flash CS6 in the fundamental skill of creating modified journals, students would be better able to comprehend the course information.

According to Suwardjono (2014: 101), an adjusting journal is the recording or acknowledgment (journaling and recognition) of certain transaction data at the end of the period so that the amount of rupiah contained in each account corresponds to the actual situation at the end of the period. Adjusting entries are made in the general journal and are needed to adjust accounts that do not show the balance they should have. Based on the syllabus used at SMK Budisatrya Medan, this material was chosen in the creation of a multimedia-based interactive learning model because it is difficult material in studying accounting, and it is hoped that students can receive the adjustment journal material with learning multimedia as fun so that learning can take place optimally and achieve learning objectives. The adjustment journal material is appropriate for use in the interactive multimedia-based learning model because the material presented is in agreement with the notion of the interactive multimedia-based learning paradigm being created.

Angel and Rahmah (2022: 34) states that interest is a person's soul's inclination towards someone (usually accompanied by feelings of pleasure) because they feel there is an interest in that something. Students' interest in learning can also be influenced by the surrounding environment, such as teachers, peers, and innovative learning models based on interactive multimedia. One factor is the use of models with learning media where teachers still use traditional teaching approaches, which results in low student interest in learning. So teachers must have talent and imagination to choose learning models and use media that may affect how well students learn. Using technology to learn through interactive, multimedia-based learning models is one way that teachers can help students grasp the subject they are teaching them.

Joyce et al. (2000) stated that learning models can help students acquire knowledge, concepts, abilities, mindsets, and the ability to articulate their own thoughts. In addition, they instruct kids on how to learn. Creating learning models can enhance student learning outcomes by making the learning process more efficient and convenient to apply. In line with Adhim (2021: 364), the learning model is useful for creating interesting and varied learning conditions so that because students' creativity and activity are directly included into the learning process, they do not grow bored and are eager to participate.

This interactive multimedia-based learning model can be implemented well through supporting software or applications. One piece of software that is complete with interactive animation is Adobe Flash CS6. This is consistent with the assertion made by Madcoms (2013) that Adobe Flash CS6 is a useful program for facilitating interactive learning. Adobe Flash CS6 allows for the combination of visuals, motion, and sound in interactive learning materials that may also communicate with users. Additionally, Neo's research from 2002 demonstrates that the use of multimedia technology in education has brought about a paradigm change that will have a significant effect on the educational system how teachers teach, and how students learn. The introduction of multimedia technology in the field of education will give birth to a new generation. technology-savvy young people.

The results of other research by Eskandari and Ebrahimi (2013) revealed that through the use of computers and multimedia, students have shown positive perceptions of the learning environment, namely getting higher scores on exams, so that this perception keeps students motivated to learn. Another benefit based on research results, according to Almara'beh et al. (2015), is that it makes learning more dynamic, more durable, and more applicable to everyday life.

Previous research by Holtzblatt and Tschakert (2011) shows that the use of multimedia in the form of digital video in teaching accounting and utilizing the capabilities provided by digital video technology is very promising for accounting learning. This is also supported by the research results of Coetzee and Lubbe (2014), who found that in Africa, students studying in the field of accounting stated that technology-based learning through web tutorials greatly benefits students in learning compared to conventional learning. In line with that, the research results of Miñano et al. (2016) also state that learning accounting in Spain using an interactive multimedia learning model is very useful, interesting, and satisfying for their learning, which increases the value of accounting.

Ariesto (2003: 7) states that interactive multimedia, or non-linear multimedia, is multimedia that can handle user interaction, where the user can choose what to do next, ask questions, and get answers that will influence the computer to carry out the next function. Meanwhile, according to Zainiyati (2017: 172), using a variety of media together—text, video, graphics, and so forth—to accomplish the ten learning objectives that have been developed is known as multimedia in the educational process.

Angeline (2011) provides multimedia can be defined as a blend of text, images, music, animation, and video. If the user can freely control it, this is called interactive multimedia. According to Thorn (in Ena 2001) proposed six criteria for assessing interactive multimedia, namely: (1) the first criterion is ease of navigation, (2) the second criterion is cognitive content, (3) the third criterion is information presentation. (4) The fourth criterion is media integration; (5) the fifth criterion is artistry and aesthetics; and (6) the sixth criterion is overall function.

Merrill's opinion in Daryanto (2013: 17) classifies multimedia software quality criteria into two, namely learning criteria and presentation criteria. Learning criteria refer to aspects of pedagogy, teaching techniques, or learning strategies. Meanwhile, the four primary categories of presentation requirements are interaction, convenience of use, navigation, and display format.

One of the most well-known presentation media is PowerPoint, which is part of Microsoft Office. Microsoft Office Power Point offers slide layout capabilities to support the primary discussion points that will be presented to the students. An intriguing modification can be made to a slide using animation facilities. Likewise, there are amenities: a strong slide can be made with effects, music, and a front image. Thus, make accommodations based on how the students learn best. This program can accommodate students who have visual, auditory, and kinesthetic types (Rusman, 2013: 297).

Adobe Flash Professional CS6 is able to equip websites with several kinds of animation, sound, interactive animation, and so on, so that users, besides being able to listen to explanations, can see animated images as well as read explanations in text form. Adobe Flash CS6 uses a programming language called ActionScript, which first appeared in Flash CS6 (Aprilia, 2017).

Interactive content is created and distributed using Adobe Flash CS6. The writing platform for producing rich, interactive content and ads for digital online delivery is Adobe Flash Professional CS6. This implies that interactive material can be produced with Adobe Flash CS6 digital advertising, and web support.

Mayer (Sriadhi, 2019: 39) states that the development of multimedia-based interactive learning must be based on design principles in accordance with the cognitive thinking of the human brain in processing information. Mayer established 10 principles of multimedia design, namely: (1) multimedia principle; (2) spatial principle; (3) temporal principle; (4) modularity principle; (8) interactivity principle; (9) pre-training principle; (8) interactivity principle; (9) pre-training principle; and (10) different individual principles.

Syntax is described in a sequence of activities called phases; each model has a different phase flow. Joyce et al. (2000: 14). The syntax of the interactive multimedia-based learning model can be seen in Table 1 below:

Table 1. Syntax of an Interactive Multimedia-Based Learning Model

Syntax	Teacher's Role
Information Phase	Providing learning directions for the adjustment journal using the IIMAE model to students for learning
Interactive Phase	Learning Providing learning that emphasizes optimal student activity by utilizing the use of media to obtain learning outcomes in the form of a balanced combination of cognitive, effective, and psychomotor aspects
Mentoring	Providing guidance during the study of adjustment journal accounting and as a facilitator who can increase students' professionalism and self-development. Providing informal interactions to influence students' ethical behavior and increase students' motivation to achieve goals by carrying out certain actions
Synthesizing Knowledge	Reconstructing knowledge and concluding information that has been obtained through the learning process. The aim of synthesizing knowledge is so that students can recall the information so that the learning goals are met.
Evaluation	Providing measurements of students' abilities and understanding as a means of providing feedback to students as a measure of learning success and a means of motivating students

The research problem formulation comprises two parts: (1) Is the interactive multimedia-based learning model appropriate for use in accounting education at Class XI AK Private Vocational School Budisatrya Medan?; and (2) Is the development of an interactive multimedia-based learning model an effective way to teach accounting?

RESEARCH METHODS

The research methodology employed in this study is the R&D (Research and Development) paradigm. According to Borg et al. (2003) in their book "Educational Research," research and development (R&D) in education is an industry-based development approach in which learning products are designed using research findings and systematically tested in the field, assessed, and revised until they are produced. a learning tool that satisfies quality, effectiveness, and efficiency requirements. The goal of this study is to create a multimedia-based interactive learning model for class XI AK accounting learning that can be measured in terms of feasibility and effectiveness.

This research was carried out by the Medan Budisatrya Private Vocational School, which is located at Jl. Lt. Sujono No. 166, Bandar Selamat, Medan Tembung District, Medan City.

The ASSURE development model will be applied in the study approach and design. It is possible to create interactive multimedia-based learning models in an organized manner. The process of development can be completed by investigating the creation of an interactive multimedia-based learning model with Adobe Flash CS6 as the first step in making the media product, which contains the adjustment journal material.

This trial stage is carried out to collect data in order to carry out a formative assessment, which serves as the foundation for deciding if the product is appealing or appropriate for usage. The following is the order in which the activities were completed: (1) Validation of experts in accounting education materials; (2) Validation of experts in media, learning design, and multimedia; (3) Individual trials; and (4) Student group trials.

After the resulting interactive accounting multimedia product was validated by media experts, material experts, and design experts, the product was then tested on three students at Medan Budisatrya Vocational School in Class XI, which was divided into three trial stages, namely: (1) A trial is individually carried out by three people who have low, medium, and high levels of understanding of what is being taught. (2) Small group trials were carried out by 9 people; 3 people had a low level of understanding, 3 people had a medium level of understanding, and 3 people had a high level of understanding. The next three (3) field trials were carried out by all 25 people (one class).

The questionnaires required are as follows: (1) assessment questionnaire from learning design experts; (2) assessment questionnaire from media experts; (3) assessment questionnaire from material experts; and (4) assessment questionnaire from students.

Table 2. Material Expert Validation Instrument Grid

Assessment Aspects	Indicator
Guide and Information	1. Description of the multimedia product 2. Guide to using multimedia software 3. Implementation guide 4. Formulation of goals 5. Formulation of competencies/goals/learning outcomes (CP)
Multimedia Materials	1. Goal alignment with curriculum requirements 2. Material suitability for intended use (CP) 3. Suitability of the material to user characteristics 4. Up to date material 5. Description of the concept or theory 6. Order (syntax) of presentation of material 7. Conformity of material coverage with objectives (CP) 8. Suitability of material depth to objectives (CP) 9. Providing examples or illustrations for material support 10. Providing a summary 11. Suitability of time duration with presentation material 12. Spelling and grammar usage when presenting information
Evaluation	1. Practice/exam instructions 2. Suitability of the question coverage with the objectives or CP 3. Suitability of the cognitive level of the test items with the objectives or CP 4. Suitability of the difficulty level of the questions with the objectives or CP 5. Distribution of questions for each level based on objectives or CP 6. Suitability of exam questions to the duration of time provided 7. Variations in question material and its suitability to the objectives or CP 8. Return (review) the results of the practice or exam

Table 3. Learning Design Expert Validation Instrument Grid

Assessment Aspects	Indicator
Learning Design	1. Accuracy of Topic Selection 2. Suitability of material with learning indicators 3. Providing training 4. Consistency of tests with learning indicators
Information Design	1. Providing motivation 2. Use of Study Instructions 3. Clarity of material description 4. Clarity of the examples given 5. Feedback on student learning test results 6. Explanation of terms 7. Maximizing the learning process 8. Ease of use
Presentation Design	1. Color composition 2. Use of graphics 3. Selection of font type and size 4. Use of navigation buttons 5. The quality of the images and animation 6. Music usage

Table 4. Media Expert Validation Instrument Grid

Assessment Aspects	Indicator
Guide and Information	1. Description of the multimedia product 2. Guide to using multimedia software 3. Assistance facilities
Software Operations	1. Ease of installation and/or configuration settings 2. Accuracy in the use of media navigation symbols 3. Ease of use of media navigation buttons 4. Search accuracy and material links (hyperlinks). 5. Interface quality 6. Software operational consistency 7. Software operational reliability from error free 8. Operating system support required 9. User responsive stimulus interactivity with the system
Systematics, Aesthetics, and Media Principles Media	**Systematics** 1. Systematic media screen displays 2. Menu facilities in the media 3. letter, number, and symbol acceleration **Media Aesthetics** 1. The resolution or visual quality of graphics or images 2. The screen's color composition and resolution 3. Align the text's hue with the backdrop. 4. Text, graphics, audio, and animation speed **Narration and audio quality** 1. Clarity of the narrator's voice 2. Ease of understanding the language in the narrative 3. Narration free from noise 4. Narrative is communicative according to user needs 5. Suitability of the background sound to the presentation material 6. Setting or controlling background sound 7. Selection of interlaced and progressive scan

Assessment Aspects	Indicator
	8. The quality of the animation or video 9. Using the pixel-resolution of videos and animations 10. The animation or video object's suitability for the presenting material 11. Object visualization of abstract concepts and properties of matter 12. Ability to reduce misperceptions of objects 13. Principles of multimedia design 14. Application of spatial principles 15. Use of temporal principles 16. Use of clues and signaling 17. Reduction of redundancy effects 18. Application of the principle of coherence 19. Use of modality principles 20. Reduction of cognitive load for users

Table 5. Student Trial Instrument Grid

Assessment Aspects	Indicator
Content Eligibility	1. Suitability of the material provided 2. Study instructions provided 3. The sentences in the text are easy to understand 4. Order of presentation of material 5. Practice questions and assignments given 6. There is feedback from learning results 7. Suitability of practice questions for the content of the material
Presentation	1. Media Display 2. The text used is easy to read 3. Image and animation quality 4. Color composition 5. Interaction in learning
Usefulness	1. I can understand the adjustment journal material using the Interactive Multimedia-based IIMSE learning model 2. I find it easier to learn using the Interactive Multimedia-based IIMSE learning model 3. I am interested in studying accounting

Table 6. Student Field Trial Instrument Grid

Assessment Aspects	Indicator
Content Eligibility	1. Clarity of learning objectives 2. Accuracy of material 3. Correctness of the concept 4. Depth of learning material 5. Conformity with the curriculum 6. Accuracy in the arrangement of learning materials 7. Suitability of questions to the material
Presentation	1. Quality of presentation 2. Involvement of students in learning 3. Quality of feedback 4. Serving time 5. Quality of practice questions
Language	1. Logical presentation 2. Use of language 3. Ease of understanding the language

Product Feasibility Test Data Analysis Techniques

In order to improve the evaluation and make more informed conclusions, all of the data gathered from the questionnaire is evaluated using descriptive statistical techniques and quantitatively sorted by category in this development research. This process is known as quantitative descriptive analysis. Quantitative data with a rating scale of 1 to 5 was created from qualitative data in the form of very poor, poor, sufficient, good, and very good statements.

The following formula and criteria will be used to translate the product development criteria into values on a Likert scale:

Table 7. Assessment Criteria

Mark	Criteria	Percentage (%)
A	Very Worth It	81 – 100
B	Worthy	61 – 80
C	Decent Enough	41 – 60
D	Not Worth It	21 – 40
E	Very Inadequate	0 – 20

Source: Sugiyono (2011: 134-136)

The testing criteria are:
Ho : μ < 61% then the product is not feasible
H1 : μ > 61% then the product is feasible

Feasibility Test Data Analysis Techniques

Input obtained from the results of multimedia assessments by experts is then analyzed using the following formula (Sriadhi, 2018):

a. Tabulate the response ratings for every instrument item in every aspect (a).
b. Use the following formula to determine the average answer score for each aspect:

$$\bar{x} = \frac{\sum X}{n}$$

Information:
$\bar{x}$: Average score
$\sum X$: Total score of statement items
n : Number of data (number of statement items)

c. All item scores from the three assessment elements are included in determining the average value, which is then calculated using the following method to determine the acceptability of the media overall:

$$\bar{x}_t = \frac{\sum X_i}{N}$$

Information:
$\bar{x}_t$: Average score
$\sum X_i$: Sum of the three assessment components
N : Total information for the three evaluation components

The results of this calculation are interpreted as shown in Table 8 below in order to establish feasibility:

Table 8. Interpretation of Product Quality

No	Interval Mean Score	Interpretation
1.	1.00 – 2.49	Not feasible
2.	2.50 – 3.32	Not Worthy
3.	3.33 – 4.16	Worth
4.	4.17 – 5.00	Very Worthy

(Adapted from Sriadhi, 2019)

Effectiveness Test Data Analysis Techniques

Two methods of data analysis are employed: inferential and descriptive. In order to examine data, descriptive techniques are statistics that describe the data that has been gathered with no intention of making generalizations or inferences. data presentation with descriptive methods such as tables, graphs, pie charts, pictograms, and the computation of the mean, standard deviation, percentile, mode, median, and regression without significance testing. Conversely, inferential techniques are statistical methods for examining sample data; the outcomes are then applied to the entire population, and the conclusions made may or may not be true.

The steps for data analysis techniques are as follows:

Average value

The following formula is used to obtain the average value for Sugiyono (2011)

$$\bar{x} = \frac{\sum X_i}{n}$$

$\bar{x}$: Mean (Average)
$\sum X_i$: the number of x values from I to n
n : Number of individuals

Standard deviation (Standard Deviation)

$$s = \sqrt{\frac{\sum (X_i - \bar{X})^2}{(n-1)}}$$

Information:

s : sample standard deviation
X_i : value of x 1 to n
$\bar{x}$: average
$(n-1)$: degrees of freedom
n : Number of samples

To ascertain whether or not the research data is normally distributed, the normalcy test is performed. This indicates whether or not the population's data distribution is normal. The Chi Square formula is used to test the normalcy of this data in the following ways:

$$x^2 = \sum \left(\frac{(F_0 - F_h)^2}{F_h} \right)$$

Information:

x^2 = Chi Square
F_0 = Frequency obtained from the sample
F_h = Expected frequency of the sample

According to Arikunto (2014), With a significance level of 5% and degrees of freedom equivalent to the number of frequency classes -1 (dk=K-1), the Chi Square value is utilized. It can be argued that the data is regularly distributed if x^2 count ≤ x^2 table. To find out if the population's data distribution is homogeneous, the homogeneity test is used. According to Sudjana (2005: 249), the homogeneity of variance test can be calculated using the Barlett test, namely:

$$F = \frac{s_1^2}{s_2^2}$$

Where,
s_1^2 = group one sample variance
s_2^2 = sample variance of group two
Test criteria:
If Fcount < Ftable, then the samples have the same variance.
If Fcount > Ftable, then the samples do not have the same variance.

Hypothesis test

The validity of the research hypothesis must be ascertained; in this study, the t-test (an independent test) is the statistical method employed to do this. The sample group's post-test findings must be present for the t-test data analysis requirements to be fulfilled. The following is the hypothesis for the efficacy test that will be investigated:

Ho : $\mu_1 = \mu_2$
Ha : $\mu_1 \neq \mu_2$

Information:
μ_1 : The mean academic achievements of learners who employ interactive multimedia-based learning approaches are denoted.
μ_2 : mean learning results of pupils enrolled in traditional classroom settings.
Ha : Learning outcomes in classes that use interactive multimedia-based learning methods differ significantly from those in traditional ones.
H0 : Learning outcomes do not significantly differ across classrooms that use interactive versus traditional multimedia-based learning paradigms.

To test the hypothesis, the two-party test formula is used:

$$t_{count} = \frac{\overline{x}_1 - \overline{x}_2}{S\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

where S is the formula's determination of the combined variance's root:

$$S^2 = \frac{(n_1-1)S_1{}^2 + (n_2-1)S_2{}^2}{n_1 + n_2 - 2} \quad \text{where} S = \sqrt{s^2}$$

Information:
$\overline{x}_1$: average experimental class score
$\overline{x}_2$: average control class score
n_1 : number of experimental class samples
n_2 : number of control class samples
$S_1{}^2$: variance in the experimental class
$S_2{}^2$: variance in the control class
S : combined variance
t : calculation price

If, at a significance level of 5%, tcount > ttable, as determined by the t distribution list

with degrees of freedom dk = n1 + n2 – 2, the H1 testing requirement is accepted.

The effectiveness value of media using an interactive learning model using Adobe Flash CS6 is obtained based on the percentage of classical completeness, which is then categorized based on a minimum learning completeness standard of 75 in accounting subjects where the effectiveness criteria are met if students achieve completeness greater than or equal to 75.

RESULTS AND DISCUSSION

At the development stage, the collection and creation of Interactive Multimedia in Class XI AK SMK Accounting Learning which has been developed in this research is described as follows:

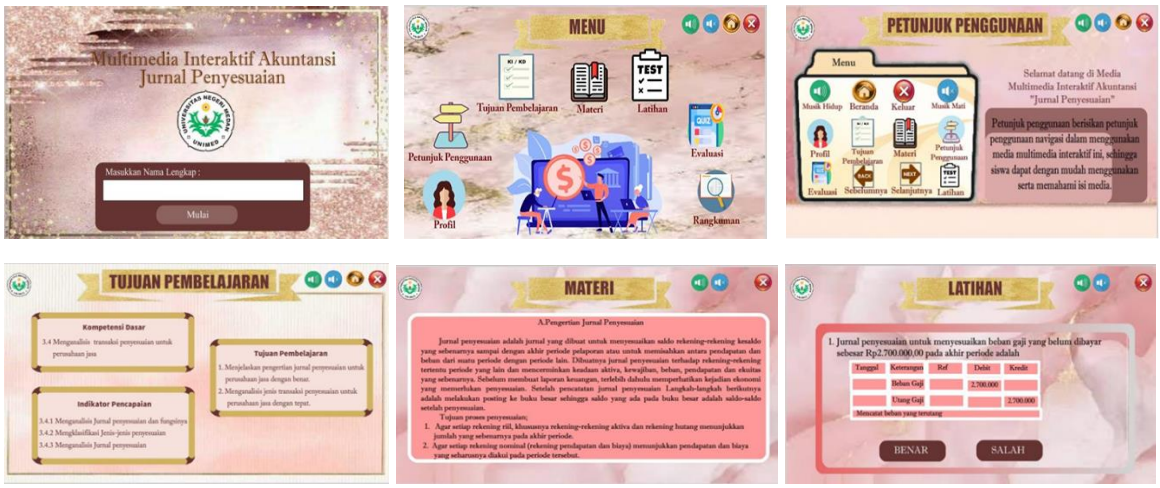

Figure 1. Display of Interactive Multimedia Based Learning in Class XI AK SMK Accounting Learning

Table 9. Validation Results of All Aspects by Material Experts

No	Assessment Aspects	Mean	Percentage	Criteria
1	Guide and Information	4.00	100%	Very Eligible
2	Multimedia Material	3.5	87.5%	Very Eligible
3	Evaluation	3.62	90.62%	Very Eligible
	Average	**3.72**	**90.63%**	**Very Eligible**

Based on the table above, an assessment score is obtained and Very Good is included in the "Very Eligible" category

Table 10. Validation Results of All Aspects by Experts

No	Assessment Aspects	Mean	Percentage	Criteria
1	Learning Objective	4.00	100%	Very Eligible
2	Information Design	3.37	84%	Very Eligible
3	Learning Model Structure	3.5	88.8%	Very Eligible
4	Desired Learning Outcomes	4.00	100%	Very Eligible
	Average	**3.52**	**88.1%**	**Very Eligible**

Based on the table above, an assessment score is obtained and it is included in the "very eligible" category.

Table 11. Validation Results of All Aspects by Media Experts

No	Assessment Aspects	Mean	Percentage	Criteria
1	Guide and Information	4.00	100%	Very Eligible
2	Software Operations	3.33	83.9%	Very Eligible
3	Aesthetic Systematics and Media Principles	3.5	88.8%	Very Eligible
4	Video Quality	3.00	75%	Eligible
5	Principles of Multimedia Design	3.85	96.4%	Very Eligible
	Average	**3.45**	**86.4%**	Very Eligible

Individual trials for 3 Medan Budisatrya Vocational School students based on 3 assessment aspects as seen in Table 12 below:

Table 12. Individual Trial Student Assessment Results

No	Assessment Aspects	Mean	Percentage	Criteria
1	Feasibility Contents	3.9	78.00%	Very Eligible
2	Servings	3.86	77%	Very Eligible
3	Usefulness	3.77	75.50%	Very Eligible
	Average	**3.87**	**77.30%**	Very Eligible

Small group trials with 9 students at Medan Budisatrya Vocational School based on 3 aspects of assessment as seen in Table 13 below:

Table 13. Student Assessment Results in Small Group Trials

No	Assessment Aspects	Mean	Percentage	Criteria
1	Feasibility Contents	4.09	86.9%	Very Eligible
2	Servings	4.08	85%	Very Eligible
3	Usefulness	4.22	84.44%	Very Eligible
	Average	**4.29**	**85.92%**	Very Eligible

The field trial was conducted on 25 Medan Budisatrya Vocational School students based on 3 assessment aspects as seen in table 14 below:

Table 14. Student Assessment Results in Field Trials

No	Assessment Aspects	Mean	Percentage	Criteria
1	Feasibility Contents	4.77	95.54%	Very Eligible
2	Servings	4.68	94%	Very Eligible
3	Usefulness	4.7	94.13%	Very Eligible
	Average	4.7	94.66%	**Very Eligible**

Table 15 below shows the summary findings of the individual trials, small group trials, field trials, and material experts' evaluation of the viability of the interactive multimedia-based IIMSE learning model in accounting learning:

Table 15. Average Summary of Feasibility Test

No	Respondent	Rating result	Criteria
1	Material Expert	90.63%	Very Eligible
2	Design Experts	86.7%	Very Eligible
3	Media Experts	86.5%	Very Eligible
4	Individual trials	77.3%	Eligible
5	Small group trials	85.92%	Very Eligible
6	Field trials	94.66%	Very Eligible

Table 16 below is an overview of the data normality test:

Table 16. Summary of Normality Test

Class	Lcount	Ltable	Conclusion
The interactive multimedia-based IIMSE learning approach is used to teach student learning outcomes	0,071	0,180	Normal
Learning objectives imparted using traditional learning methods	0,148	0,180	Normal

The data on student learning outcomes taught using the interactive multimedia-based IIMSE learning model is found to be normally distributed in the above table. The big Lcount < Ltable at the 5% significant level, which is 0.071< Ltable at the 5% significant level, which is 0.148, indicates this. Table 17 below is a summary of the data homogeneity test:

Table 17. Summary of Homogeneity Test

Class	Fcount	Ftable	Conclusion
Student learning outcomes taught using the interactive multimedia-based IIMSE learning model	1,063	1,80	Homogeneous
Learning outcomes taught using conventional learning models			

The data on student learning outcomes taught utilizing the interactive multimedia-based IIMSE learning model is homogeneous, as shown in table 17 above. The fact that Fcount < Ftable at the 5% significance level indicates this; specifically, Fcount is 1.0633, while Ftable is 1.80 at the same significance level.

When teaching accounting to Class XI AK SMK Budisatrya Medan pupils, the IIMSE learning model based on interactive multimedia produces better learning outcomes than traditional learning models.

The following is the formulation of the research hypothesis to be tested:

Ho : $\mu 1 \leq \mu 2$

Ha : $\mu 1 > \mu 2$

Information:

$\mu 1$= average learning outcomes of students who study using the Interactive Multimedia-based Learning Model

$\mu 2$= average learning outcomes of students who study conventionally.

Ho : There is a significant difference in learning outcomes between classes that study using the Interactive Multimedia-based Learning Model and classes that study conventionally

Ha : There is no significant difference in learning outcomes between classes that study using the Interactive Multimedia-based Learning Model and classes that study conventionally

From the calculation results in the Appendix, tcount = 4.363 and the ttable value at the 5% significance level is 1.677, which means tcount > ttable (4.36 > 1.677) which means H1 gets approved whereas Ho is denied. Therefore, in comparison to traditional learning models, the interactive multimedia-based learning paradigm yields better learning outcomes. Table 18 below provides an overview of the hypothesis testing process:

Table 18. Summary of Hypothesis Test Calculations

Average Posttest Score		tcount	ttable	Conclusion
Using Interactive Multimedia-based Learning Models	Using Conventional Learning Models	ttable	1,67	There is a significant difference
80,60%	**70,20%**			

The learning outcomes of students using the interactive multimedia-based IIMSE learning model are higher than those of students using conventional learning models, according to empirical evidence derived from hypothesis testing results. The following describes how well the interactive multimedia-based IIMSE learning model works for accounting education:

$$\bar{x} = \frac{score\ obtained}{number\ of\ ideal\ scores} \text{ x } 100\%$$

$$\bar{x} = \frac{2015}{2500} \text{ x } 100\% = 80{,}6\%$$

Meanwhile, the effectiveness of learning using conventional models

$$\bar{x} = \frac{score\ obtained}{number\ of\ ideal\ scores} \text{ x } 100\%$$

$$\bar{x} = \frac{1755}{2500} \text{ x } 100\% = 70{,}2\%$$

Thus, the effectiveness value of the interactive multimedia-based IIMSE learning model in accounting learning is higher than conventional learning models.

Discussion

The IIMSE learning model development product based on interactive multimedia in accounting learning is content that has been created with consideration for medium, instructional design, and content characteristics. The goal of this research and development was to create an interactive, multimedia-based IIMSE learning model that could help with the learning process and enhance student learning outcomes in Budisatrya Vocational School Medan's class XI accounting course. This research and development procedure begins with a preliminary study, data collection, product creation, and product validation testing, which will then be revised and perfected based on expert suggestions and assessments. The next stage is user trials to produce a product that is feasible and useful in the learning process.

As Akbar (2013), the validity of a learning model is established when each of the three validation elements has been deemed valid. The three components of validation are practitioner users, or professional teachers; audience validation by students; and expert validation. In testing the IIMSE learning model based on interactive multimedia, apart from filling experts.

According to Mais (2016), Three standards determine whether learning media are appropriate: (1) Technical feasibility is media capability connected to media quality; (2) Practical quality is based on the simplicity of delivering content via media, such as user familiarity with operating or using the media, ease of accessing and reaching the media, ease of use, and ease of controlling it. Effectiveness is determined by a number of elements, including the alignment between learning objectives and learning media, the clarity with which information is presented, and the methodical organization of the

material. Learning media is deemed acceptable if it can give users enough knowledge; (3) The effectiveness and efficiency of the learning process, considering costs that can be avoided, determines whether the costs associated with learning media are appropriate.

Furthermore, According to study by Amrulloh (2013), media professionals, subject teachers, and material specialists must evaluate the media in order to create media that is theoretically feasible. The theoretical viability of the media is examined from two perspectives: (1) the material's appropriateness, which covers how well the media's content aligns with ideas and learning objectives; and (2) the media's suitability, which covers the media's format, quality, and concept suitability. The production of learning materials that are both theoretically and practically possible for use in the learning process is dependent upon the viability of these two factors.

According to Arsyad (2011: 217), an evaluation of the learning design encompasses an evaluation of the media utilized if the media is incorporated as a fundamental component of the educational process. When evaluating learning media, Walker & Hess provide the following criteria in Arsyad's book (2011: 219–228): (1) quality of content and objectives, which includes relevance, accuracy, balance, interest, and compliance with student situations; (2) instructional quality, which includes offering learning opportunities, supporting learning, motivation, flexibility in the classroom, quality of tests and assessments, and impact on students and teachers; and (3) technical quality, which includes readability, ease of use, display quality, management, and documentation.

Thorn (2006) explains six criteria in order to assess the quality of interactive multimedia, namely: (1) ease of navigation process; (2) Mental substance. (3) the way the information is presented; (4) the integration of media; (5) the creative and aesthetic; and (6) the ultimate purpose. Additionally, all forms of media that include text, graphs, audio, and interactivity are combined and optimized in interactive multimedia (Green & Brown, 2002: 2–6).

Based on the explanation above, it can be concluded that the interactive multimedia-based IIMSE learning model is proven to be suitable for use because it has passed material, media, and instructional design validation tests. Even tested individually, in small groups, and in field tests. And the average result was declared "very good.".

When a learning media product can consistently produce positive outcomes in meeting predefined learning objectives, it is considered successful. In this instance, learning outcomes following development were used to conduct a product effectiveness trial in the teaching and learning process between teachers and students. Utilizing the product, learning was done. There were differences between the learning outcomes of students who used the interactive multimedia-based IIMSE learning model in accounting and students using the conventional learning model, namely the average value of accounting learning, particularly on the adjusting journal material taught, according to the research data processing results. Based on the results of the t test, which produced tcount = 4.36, which is greater than ttable of 1.67, the IIMSE learning model based on interactive multimedia is higher than utilizing the conventional learning model.

CONCLUSION

Drawing from the outcomes of the investigations and conversations, the ensuing deductions can be made:

1. Production of an interactive multimedia-based learning model that starts with data collection, student needs and characteristics analysis, learning material formulation, learning and product design, validation, and revision until product trials demonstrate that the created media product is based on a learning model. Interactive multimedia is

appropriate for usage in Budi Satrya Vocational School's class XI accounting curriculum in Medan.

2. Interactive multimedia-based learning model products are effectively used when compared to traditional learning methods, and can enhance student learning outcomes.

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