A Review Learning Media Development Model

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Abstract: This study aims to review various models of ICT-based learning media development. This study covers several development models such as ADDIE, SAM, RADD, Agile Development Model, Spiral Model, and DADD. The purpose of this research is to evaluate the advantages and disadvantages of each model and provide the best recommendations for the development of effective and efficient learning media. The results of this study are expected to contribute to the development of ICT-based learning media in the future.

Keywords: Learning Media, Development Models, Elearning

INTRODUCTION

The development of the digital era and information and communication technology (ICT) has great potential to simplify and accelerate the learning process, so it is very important to use ICT technology in learning [1][2]. In recent years, ICT technology has been widely used in learning ranging from traditional learning to online learning.

The use of ICT technology in learning requires quality and effective learning media products. Therefore, learning media development models have been developed to assist in the manufacture of quality and effective learning media products [3]. Each model has its own advantages and disadvantages. Such as ADDIE, SAM, RADD, Agile Development Model, Spiral Model, and Dynamic Application Development Model.

However, each model has its own advantages and disadvantages. Therefore, it is necessary to review the models of learning media development to choose the right model for the development of ICT-based learning media [4]. A review of the learning media development model will help determine a model that fits the needs of learning media development and determines a model that has efficient and effective development stages.

This study aims to obtain an overview of the ICT-based learning media development model and determine the most appropriate learning media development model for use in the development of ICT-based learning media. This review of learning media development models is expected to help learning media developers in making quality and effective learning media products. Thus, it is expected to simplify and accelerate the learning process for students.

RELATED WORK

The learning media development model involves a study that discusses the available learning media development models and compares the advantages and disadvantages of each model. Several types of research that can be carried out in this field are as follows:

1. Review of learning media development models [5]: This study aims to obtain an overview of the available learning media development models and compare the advantages and disadvantages of each model. The results of this study can be used to determine the appropriate learning media development model to be used in the development of learning media.
2. Evaluation of the learning media development model [6]: This study aims to evaluate the effectiveness of the learning media development model used in the development of learning media. This research can use qualitative and quantitative approaches to assess the quality of learning media products produced through learning media development models.
3. Modeling the learning media development model [7]: This study aims to model the development model for new learning media or modify the existing learning media development model. This research includes the development of new theories and models for the development of instructional media.
4. Learning media development model application [8] : This study aims to test and apply the learning media development model in the development of learning media. The results of this study can be used to improve and improve the quality of learning media products.

By conducting research related to the learning media development model, it is expected to obtain useful information and can assist in the development of quality and effective learning media.

METHODS

The learning media development model is a framework used to evaluate, design, and develop effective and efficient learning media. There are several models of developing learning media. Each model has different stages and aspects and can be selected according to the needs and conditions of the learning media development project.

Here are some models of learning media development that are often used:

1. The ADDIE Model (Analysis, Design, Development, Implementation, and Evaluation) is a development model that follows a structured and systematic process in developing learning media. This model requires specific stages and involves needs analysis, designing learning media, developing learning media, implementing, and evaluating.
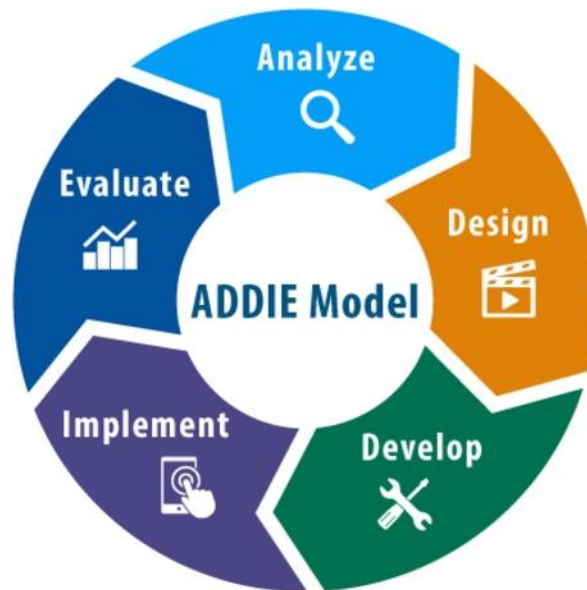
Figure 1 : ADDIE Model [9]

The ADDIE model is one of the most widely used learning media development models. The ADDIE model consists of 5 stages, namely:

- **Analysis**: This stage involves research and evaluation of learning needs and objectives, as well as an analysis of the audience that will use learning media.
- **Design**: This stage involves planning and conceptualizing learning media, including technical specifications and learning materials.
- **Development**: This stage involves making learning media, including software, hardware, and learning resources.
- **Implementation**: This stage involves testing and validating learning media, as well as implementation in the learning environment.
- **Evaluation**: This stage involves evaluating the effectiveness of learning media and the development needed to improve the quality of learning media.

Each stage has specific tasks and outputs, which ensure that the learning media developed meet learning needs and objectives. The ADDIE model ensures that the learning media developed are effective and efficient solutions for learning.

2. SAM (Successive Approximation Model) is a development model that follows an iterative process to improve and improve the quality of learning media products. This model has three main stages, namely design, development, and evaluation.
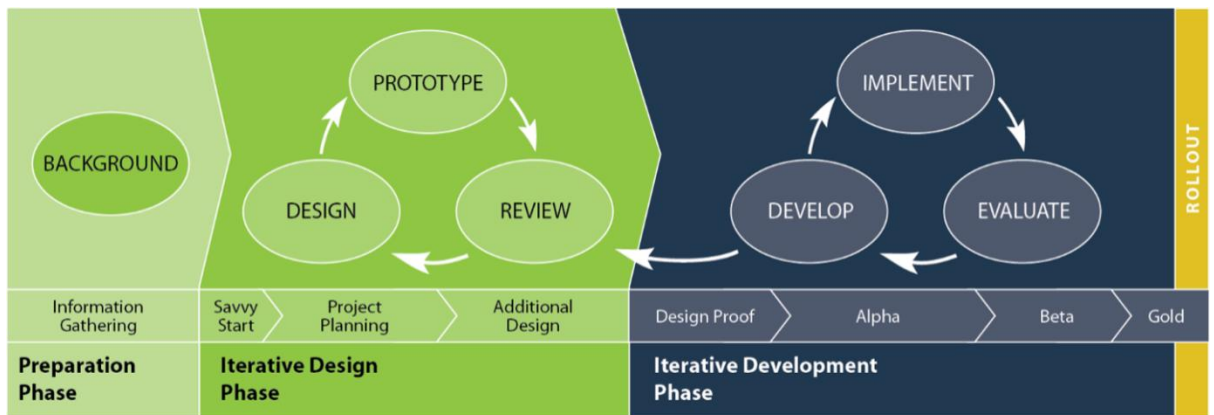
Figure 2: Successive Approximation Model [10]

The stages of the Successive Approximation Model (SAM) are as follows:

− **Needs Analysis:** the initial stage that focuses on the identification and analysis of learning needs, including the definition of goals, objectives and learning context.
− **Preliminary Design:** the next stage focuses on simple learning product designs based on needs analysis.
− **Implementation:** this stage focuses on the implementation of designed learning products, taking into account trials and improvements.
− **Evaluation and Improvement**: this stage focuses on evaluating the effectiveness of learning products and improving learning products based on the evaluation results.
− **Next Design**: this stage focuses on improving the learning product and provides a more detailed and detailed design for further implementation.

− **Next Implementation**: this stage focuses on implementing more detailed and detailed learning products.
− **Subsequent Evaluation and Improvement**: this stage focuses on evaluating the effectiveness of learning products and improving learning products based on the evaluation results.

This SAM process is carried out repeatedly until the learning product meets quality standards and has a positive impact on the teaching-learning process.

3. RADD (Rapid Application Development Model) is a development model that focuses on the fast and practical development of learning media. This model has specific stages to accelerate the development of instructional media.
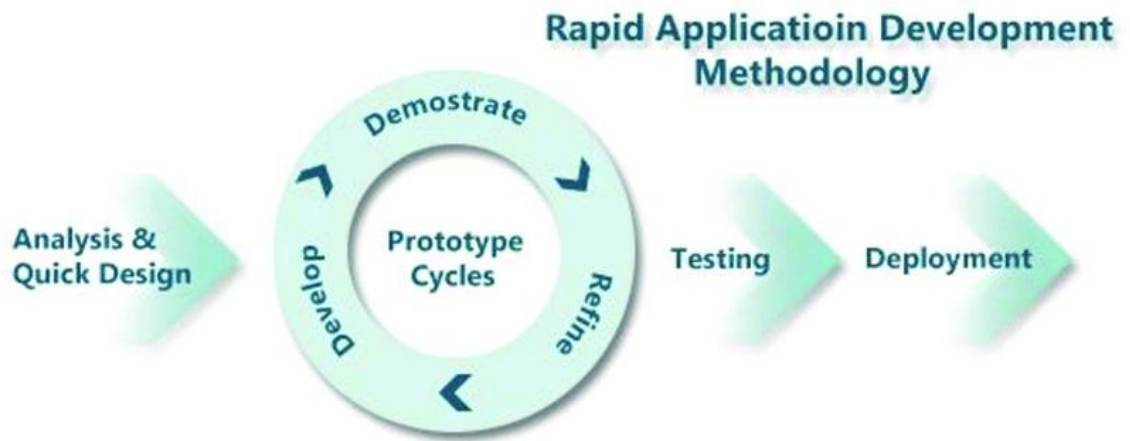
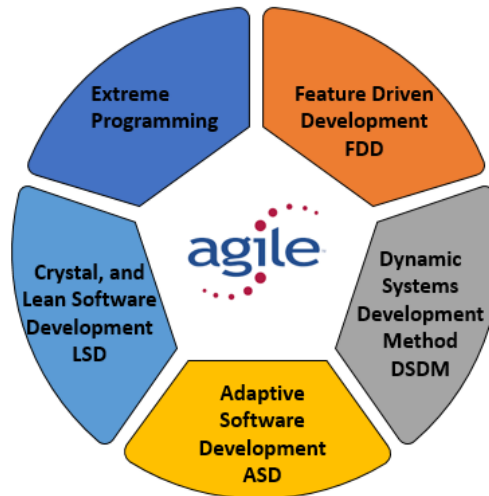Figure 3: RAD (Rapid Application Development Model) [11]

The stages of the Rapid Application Development Model (RADD) are as follows:

- **Needs Analysis**: the initial stage that focuses on the identification and analysis of learning needs, including the definition of goals, objectives and learning context.
- **Design and Implementation**: this stage focuses on the design and implementation of learning products simultaneously, taking into account trials and improvements.
- **Evaluation and Improvement**: this stage focuses on evaluating the effectiveness of learning products and improving learning products based on the evaluation results.

The RADD process focuses on developing learning products quickly, without neglecting the quality of learning products. This model focuses on the design and implementation of learning products simultaneously and considers improvements based on evaluation results. This ensures that the learning products developed meet quality standards and have a positive impact on the teaching and learning process.

4. The Agile Development Model is a development model that focuses on developing products that are flexible and adaptable to change. This model has iterative stages and follows Agile principles.

Figure 4: Agile Development Model [12]

The stages of the Agile Development Model are as follows:

- **Needs Analysis**: the initial stage that focuses on the identification and analysis of learning needs, including the definition of goals, objectives and learning context.
- **Planning**: this stage focuses on planning learning products, including the definition of specifications and priorities for developing learning products.
- **Design and Implementation**: this stage focuses on the design and implementation of learning products simultaneously, taking into account trials and improvements.
- **Review**: this stage focuses on evaluating the effectiveness of learning products and ensuring that learning products meet quality standards.
- **Retrospective**: the final stage that focuses on revising and improving learning products based on evaluation results and preparing learning products for the next development stage.

The process of developing learning products using the Agile Development Model is carried out repeatedly and continuously, ensuring that the learning products developed meet quality standards and have a positive impact on the teaching-learning process. This model focuses on the design and implementation of learning products simultaneously and ensures that learning products can always be improved and improved based on evaluation results.

5. The Spiral Model is a development model that focuses on safe product development and follows structured and systematic stages. This model involves the iterative stages of analysis, design, development, and evaluation.
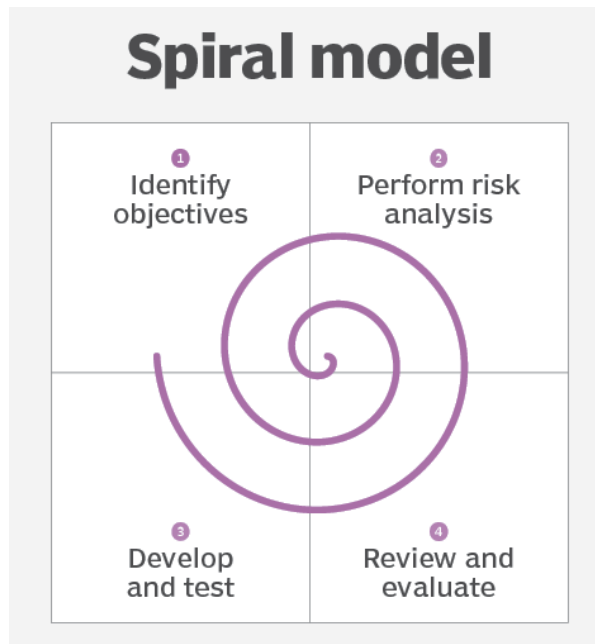
Figure 5: Spiral Model [13]

The stages of the Spiral Model are as follows:

- **Needs Analysis**: the initial stage that focuses on the identification and analysis of learning needs, including the definition of goals, objectives and learning context.
- **Planning**: this stage focuses on planning learning products, including the definition of specifications and priorities for developing learning products.
- **Design and Implementation**: this stage focuses on the design and implementation of learning products simultaneously, taking into account trials and improvements.
- **Evaluation and Improvement**: this stage focuses on evaluating the effectiveness of learning products and improving learning products based on the evaluation results.
- **Risk Evaluation**: this stage focuses on the identification and evaluation of risks that may occur during the learning product development process.
- **Re-planning**: the final stage that focuses on revising and improving learning product planning based on the results of the evaluation and risk evaluation.

The process of developing learning products using the Spiral Model is carried out repeatedly and continuously, ensuring that the learning products developed meet quality standards and have a positive impact on the teaching-learning process. This model focuses on evaluating the effectiveness and risks of learning products, ensuring that learning products can always be improved and improved based on evaluation results.

6. DADD (Dynamic Application Development Model) is a development model that focuses on developing products that are dynamic and adaptable to change. This model has specific stages and involves iterative and iterative product development [11].

DADD (Dynamic Application Development Model) stages are as follows:

- **Needs Analysis**: the initial stage that focuses on the identification and analysis of learning needs, including the definition of goals, objectives and learning context.
- **Planning**: this stage focuses on planning learning products, including the definition of specifications and priorities for developing learning products.
- **Design and Implementation**: this stage focuses on the design and implementation of learning products simultaneously, taking into account trials and improvements.
- **Evaluation and Improvement**: this stage focuses on evaluating the effectiveness of learning products and improving learning products based on the evaluation results.
- **Trial and Verification**: this stage focuses on testing learning products and verifying learning products according to specifications and quality standards.
- **Deployment**: the final stage that focuses on mass implementation of learning products and their deployment to end users.

The process of developing learning products using DADD is very dynamic and oriented towards the quality of learning products. This model focuses on making learning products simultaneously and emphasizes improving learning products based on evaluation and trial results. This model is very suitable for learning products that require continuous improvement and change.

7. 4D: The naming of the Four D (4D) development model is taken from the four development stages in the same direction, namely: Define, Design, Develop, and Disseminate.

Figure 6: 4D Model [14]

Each development model has its advantages and disadvantages. The selection of the right development model is very dependent on the context and needs of the development of learning media.

Aspects of learning media design include several things, such as:

- Learning goals and objectives: determine the learning goals and objectives to be achieved through learning media.
- Needs analysis: involves identifying and analyzing the needs of users and the learning environment.
- Learning concepts and strategies: involves selecting learning concepts and strategies to be used in learning media.
- Content design: involves the effective and efficient design of content and organization of learning materials.
- Interaction and media: involves selecting and designing interactions and media to be used to support the learning process.
- Evaluation and feedback: involves designing effective evaluation and feedback systems to improve product quality and learning outcomes.

Aspects of instructional media design must be considered and applied in a systematic and integrated manner throughout the learning media development process. Good design must pay attention to the needs and expectations of users, and ensure that learning media are effective and efficient in supporting the learning process.

RESULT AND DISCUSSION

Learning media development research uses various development models. The following is a comparison of the advantages and disadvantages of using the learning media development model.

Table 1: Comparison of the advantages and disadvantages of using the learning media development model.

Model	Studi	Advantages	Disadvantages
ADDIE	[15][16]	That it has proven to be effective for learning. Also, since the larger pieces of the project are planned, it becomes easy to measure the time and cost involved in the project.	The model is rigid and can be inflexible to adapt to unforeseen project changes.
SAM	[17][18]	SAM offers a faster and more agile approach to instructional design.	During the development process, the model's iterations make room for evaluations and changes to the project as needed. The model also strongly encourages collaboration between the instructional designers and the customers at each step
RAD	[19][20]	– Flexible and adaptable to changes – It is useful when you have to reduce the overall project risk	– It can't be used for smaller projects – Not all application is compatible with RAD
Agile Development Model	[21][22]	– The agile Development Model provides additional techniques obtainable, so in that case, if there is any kind of Modify request or improvement appears among any level, it could be applied without any budget. – In the Agile Development Model, efficiency could be produced quickly.	– There is certainly large people dependency as you can find minimal paperwork is completed. – It is not ideal for managing complicated dependencies. – Transfer of technology towards the additional new team is usually hard because there is very much less paperwork is completed. – It offers a few troubles to testing due to insufficient documentation.
Spiral Model	[23][24]	Changes made to the requirements after development has started can be easily adopted and incorporated.	– High cost - The spiral model is expensive and, therefore, is not suitable for small projects. – Dependence on risk analysis - Since successful completion of the project depends on effective risk handling, then it

			is necessary for involved personnel to have expertise in risk assessment.
Dynamic Application Development Model	[25][26]	Can develop according to needs	The fundamentals sometimes change because there are too many changes
4D	[27][28]	It is better to use it as the main subject to develop a learning tool, not just to develop a learning system	The 4D model only reaches the deployment stage, and there is no evaluation

CONCLUSION

There are various models available to assist learning media developers in managing the learning media development process. These models, such as ADDIE, SAM, RADD, Agile, Spiral, and DADD, have different stages and each model has its own advantages and disadvantages. However, the general conclusion is that each learning media development model ensures that the developed learning media meets learning needs and objectives, as well as being effective and efficient for learning. Evaluation is also an important part of each model to ensure that learning media are continuously developed and improved to provide optimal results for learning. Therefore, in determining the learning media development model, learning media developers must consider the needs and objectives of learning, as well as carry out periodic evaluations to ensure that the learning media developed is the right solution for learning.

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