Application of Forward Chaining Method for Cognitive and Humanistic as an Indonesia Language

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Abstract. In a previous study conducted by (Cut Nuraini, "Combine Application Theory of Humanistic Learning with Cognitive Methods in Learning (Its Application in Learning Indonesian Language) as One Model of Teaching Arts)." UNSIKA: 2016) have obtained quite good results in the application of Combine Application of Humanistic and Cognitive theories in Indonesian Language Learning at FASILKOM. Referring to the success of previous research, it is unfortunate if it is not continued and developed. Previous research development in this study was by designing book applications in digital form or applications from the application of Cognitive Theory and Humanistik on Indonesian Language learning at FASILKOM using the Forward Chaining method in Expert Systems.

1. Introduction

In a previous study conducted by (Cut Nuraini, "Combine Application Theory of Humanistic Learning with Cognitive Methods in Learning (Its Application in Learning Indonesian Language as a Model of Teaching Arts)." UNSIKA: 2016) had obtained quite good results in the application of Combine Application Humanistic and Cognitive theories in Indonesian Language Learning at FASILKOM. These successes can be seen from the results of Indonesian Language learning, both test scores in the form of theory and practice tests, students can understand the whole material of Indonesian Language and can apply Indonesian language skills in any Indonesian language skills both oral and written. Good and correct Indonesian language proficiency in each presentation or discussion in class is very good. In addition, the results of student writing in the form of writing or paper are very good in terms of EYD and grammar.

The success of students in learning Indonesian Language with the application of Combine Application Cognitive Theory and Humanistic Theory can also be seen in Humanistic Books which researchers (lecturers) design and use during the learning process with students. Referring to the
above, the success of previous research is very unfortunate if it is not continued by continuing the success of previous research by developing the results of research on the application of Combine Application Cognitive Theory and Humanistic Theory. Previous research development in this study was by designing book applications in digital form or applications from the application of Cognitive and Humanistic Theory to Indonesian Language learning at FASILKOM.

2. Method
In this study the proposed method is the Forward Chaining method with Representation techniques based on Reasoning Based on Rules. The relationship of the forward chaining system starts with entering a set of known facts about working memory, then matching these facts with the IF part of the rule IF THEN.

In the case of forward chaining, the Rule Based Reasoning used is only two types, namely: a. Rule 1 (R1): If at least 4 of the 5 questions answered are true with a total value of more than or equal to 80 (n \( \geq 80 \)), then "PASS" (H1) b. Rule 2 (R2): If less than 4 questions are answered correctly or the total acquisition score is less than 80 (n <80), then a material link will appear from the five questions incorrectly answered by the participants because they have not yet understood or mastered (H2), and the next option is to return to the main menu (H3).

![Figure 1. Forward Chaining Decision Tree](image)

The advantages of this Forward Chaining method include:
a. Can generate new information from a relatively small amount of data.
b. A good approach to certain problems such as planning, supervision, regulation, and interpretation,
c. Can work well with problems that need information first.

3. Results and Discussion
3.1 System-Based Humanistic Book Content

The content contained in the system-based humanistic book in this study is as follows:

| No | Rubric Component | Material Deepening | Achieved |
|----|------------------|--------------------|----------|
| 1  | *Tanda baca*     | *Titik* :          |         |
|    |                  | a. Fungsi          |         |
|    |                  | b. Penerapan       |         |
|    |                  | *Koma* :           |         |
|    |                  | a. Fungsi          |         |
|    |                  | b. Penerapan       |         |
|    |                  | *Titik Koma* :     |         |
|    |                  | a. Fungsi          |         |
|    |                  | b. Penerapan       |         |
|    |                  | *Titik Dua* :      |         |
|    |                  | a. Fungsi          |         |
|    |                  | b. Penerapan       |         |
|    |                  | *Titik Seru* :     |         |

3.2 Forward Chaining

Steps that must be taken in making rule based forward chaining, as follows:
1. Problem definition. This stage includes domain selection and knowledge acquisition.
2. Defining input data. The Forward Chaining system requires initial data to start reference.
3. Defining the data control structure. Complex applications require an additional premise to help control the activation of a rule.
4. Writing the initial code. This stage determines whether the system has captured the domain of knowledge effectively in a good rule structure.
5. System testing. System testing is done by several rules to test the extent to which the system is running correctly.
6. Designing the interface. The interface is one of the important components of a system. The interface designer is created together with the creation of a knowledge base.
7. System development. System development includes adding interfaces and knowledge in accordance with the system prototype.
8. Evaluate the system. At this stage the system tests the actual problem. If the system has not run properly, it will do a redevelopment.
3.3 Interface Designing

The following are the interface results of the Indonesian Language learning media application that has been made and the image below is a display of questions presented to students consisting of 3 stages where in each stage there are 5 questions.

![Flowchart Forward Chaining](image)

**Figure 2.** Flowchart Forward Chaining

**Figure 3.** Problem Design Interfaces
3.4 System Encoding
At this stage, the system you want to create will be made into the programming language to produce the interface and also the functional application. The programming language used is the Java programming language with the MySQL database.

3.5 Test the system
System testing is the most important thing that aims to find errors or shortcomings in the application made. Testing intends to find out information systems that have been made to meet performance in accordance with the design goals. Testing used to test the application is a black box testing method. Black box testing focuses on testing functional information systems requirements.

Table 2. Test the Submit System

| No | Condition | Function test | Goal | Desc |
|----|-----------|---------------|------|------|
| 1. | Normal    | Students enter NPM and Name. | Students can register themselves. | Valid |
| 2. | Abnormal  | Students empty the name column or NPM. | Students fail to register. | Valid |

Table 3. Testing the Login System

| No | Condition | Function test | Goal | Desc |
|----|-----------|---------------|------|------|
| 1. | Normal    | NPM is read. | Students can log in by entering NPM. | Valid |
| 2. | Abnormal  | NPM is not legible. | Students fail to log in. | Valid |

Table 4. Test the Problem Filling System

| No | Condition | Function test | Goal | Desc |
|----|-----------|---------------|------|------|
| 1. | Normal    | Students fill in 3 stages of the problem and get a minimum score of 80. | Students pass. | Valid |
| 2. | Abnormal  | Students get grades less than 80. | Students do not graduate. | Valid |

3.6 System Evaluation
At this stage the application that has been completed is evaluated by the user, after it is as expected by the user, this application is ready to be used.

3.7 Using the system
At this stage the application that has been completed and has passed the test is implemented for application users to use.
4. Conclusion
This research produces an application system that is very useful and useful for the world of education. Because we have discussed it together, along with the times that have led to revolution 4.0 where at present all perspectives have experienced technological developments. In addition, specifically in the world of education, it is highly demanded that the latest media-based learning technology be updated. Therefore, with the creation of learning applications that are based on forward chaining, the current increase in learning media can be applied in every learning technique and learning and learning activity.

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