



Determining Talent Based on Skills Students Use Fuzzy Logic

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Abstract

In order to actively develop students' potential for spiritual and religious strength, self-control, intelligence, noble morals, and the skills required by themselves, society, the country, and the state, education is a deliberate and planned endeavor. Learning is commonly understood to be the changes that come about in a person as a result of their experiences rather than as a result of their physical development or innate qualities. In order for them to comprehend and be aware of the finest ways to advance their potential, knowledge, abilities, and skills. Talents can be used to assist attain success in school and in the workplace because they are relatively stable. Therefore, it may be claimed that talent indicates a person's capacity to pick up a certain skill, talent varies substantially, and talent remains relatively constant. The value of fuzziness or vagueness between true and untrue is what fuzzy logic is. Fuzzy logic is typically applied to situations involving noise, uncertainty, imprecision, and other similar elements.

Keywords: Education, Talent, Skills, Fuzzy Logic

1. Introduction

In essence, education is the most crucial component of attempts to build one's own abilities and skills in the home, community, and classroom. According to Law No. 20 of 2003 concerning the national education system [1], which outlines the educational process and environment for students to actively develop their potential for spiritual and religious strength, self-control, intelligence, noble character, and other skills necessary for themselves, society, the nation, and state, education is a conscious and planned endeavor [2], [3], [4].

Support and guidance are crucial in helping students increase their knowledge because learning is widely understood to be changes in people brought about by experience rather than physical growth or development or innate traits. Therefore, talent can be defined as the ability to learn a certain activity, talent is generally constant, and talent is relatively different.

By finding dominant talents, students can determine a major that suits their talents based on the superiority of their personal skills, which can be used to resolve cases of errors in choosing vocational education [5], [6].

Internal factors and external factors are the background to the problem of identifying student talents and skills faced by the school. Internal factors include intellectual aspects, such as intelligence, talent, interests, motivation, physical condition and condition, and external factors include students' social conditions, such as the environment, family economy, school and surrounding community.

Fuzzy logic is a logic that has a value of fuzziness or vagueness between true or false [7]. Fuzzy logic is generally used in problems that contain uncertainty, imprecision, noise, and so on. Fuzzy logic bridges precise machine language with human language which is based on meaning (significance). Fuzzy logic is developed based on human language (natural language).

In order to reduce the number of students who choose the incorrect major after deciding on their vocational education, the research aims to identify talents that students possess that are more dominant than their skills. This will be accomplished by using the Fuzzy Logic method calculation to help students identify talents that are more dominant than their skills [8].

In order to ascertain a student's most dominating skill worth in relation to the categories of sports, language, writing, and singing based on substitute physical fitness, music, social skills, the arts, and leadership, the fuzzy logic approach of problem solving is employed in this study.

2. Research Methods

The following is an illustration of the research flow diagram for implementing the fuzzy logic method to determine students' skill aptitude, depicted in Figure 1 below:

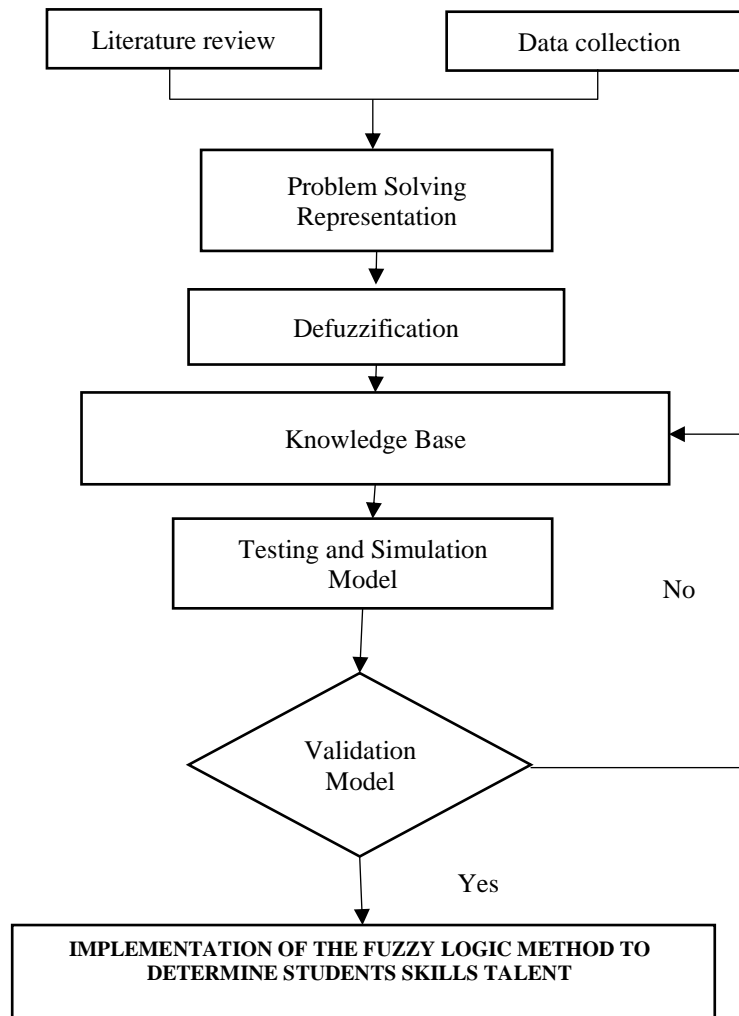


Fig. 1: Implementing the fuzzy logic method

2.1. Literature review

The author uses library research (Library Research), namely collecting data by looking for books and written works related to problems as reference material for research in order to obtain basic concepts of scientific theory that can be used in this research.

2.2. Data Used

Data collection in this research was carried out by collecting assessment data from several students at the school who had been given assessments of their skills in the fields of sports, language, communication, writing and singing.

2.3. Problem Solving Representation

There are 3 things to do in this step, namely:

- a. Determining goals and a set of alternatives;
- b. Determining Criteria
- c. Supporting data

2.4. Defuzzification

This method explains the design of the fuzzy logic method and the model for determining student talents. There are four research criteria for determining students' dominant talents.

2.5. Knowledge Base

A knowledge base in designing a decision support system is very necessary which contains rules that are useful in determining the output results of this decision support system. Designing these rules is a step after forming fuzzy sets

2.6. Model Testing and Model Simulation and Model Validation

Model testing and model simulations as well as model validation are carried out to find out whether the model is running well as desired. This is very important because it can provide information if an error occurs in the model and of course a solution can be immediately found in which part of the model needs to be repaired.

3. Results And Discussion

3.1. Problem Solving Representation

There are 3 things to do in this step, namely:

- a. Determining goals and a set of alternatives
The aim of solving this problem is to determine the most dominant skill value of a student based on the areas of sports, language skills, playing music, communication, writing and leadership possessed by the student.
Alternative skills that are taken into account are as follows:
A1 = Physical Fitness
A2 = Music A3 = Social
A4 = Art
A5 = Leadership
So: A = { A1, A2, A3, A4, A5, A6 }
- b. Determining Criteria
C1 = Sports
C2 = Speaks
C3 = Communication
C4 = Writing
C5 = Singing
So: C = { 1, C2, C3, C4, C5 }
- c. Supporting data

Table 1: Student scores

No	Student's name	Sport	Speak	Communication	Write	Sing
1	Affandi Juliandi	85.5	96.2	65.3	62.3	70.1
2	Anishara	75.5	85.3	86.2	80.1	62.3
3	Rhaditya Abdillah	85.5	95.3	96.2	70.1	52.3
4	Alviano	96.2	70.1	52.3	95.3	96.2
5	Rafiandi	86.2	80.1	62.3	85.3	86.2
6	Kevin Sanjaya	65.3	62.3	70.1	96.2	65.3
7	Aulia Zahra	65.3	85.5	62.3	80.1	86.2
8	Shakia Nisa	52.3	96.2	70.1	62.3	65.3
9	Farhan Diki	80.1	65.3	85.5	86.2	80.1
10	Ali Abdian	62.3	52.3	96.2	65.3	62.3

3.2. Defuzzification

This method explains the design of the fuzzy logic method and model for determining student talent. There are five research criteria in determining students' dominant talent, namely:

Table 2: Criteria.

Criteria	Information
C1	Sport
C2	Speak
C3	Communication
C4	Write
C5	Sing

Table 3: Range Criteria

Degree of Interest	Membership Function Value
Not good	0 – 0.45
Good	0.46 – 0.75
Very good	0.76 – 1

Based on the image above, the membership function values for each degree of interest are obtained in the following table.

Table 4: Degree of Importance of Criteria

Degree of Interest	Membership Function Value
Not good	0 – 0.45
Good	0.46 – 0.75
Very good	0.76 – 1

3.3. Knowledge Base

A knowledge base in designing a decision support system is very necessary which contains rules that are useful in determining the output results of this decision support system. Designing these rules is a step after forming fuzzy sets. The rules can be seen below:

1. IF(Exercise is good sport) and (language is very good) and (communication is very good communication) and (writing is good writing) and (singing is good singing) Then (Leadership output)
2. IF(Exercise is sport is not good) and (language is language is good) and (communication is communication is good) and (writing is writing very well) and (singing is singing very well) Then (output is Art)
3. IF(Sport is sport is not good) and (language is language is very good) and (communication is communication is very good) and (writing is writing is very good) and (singing is singing good) Then (Social output)
4. IF(Sports is sports very well) and (language is speaking very well) and (communication is communication is very good) and (writing is writing well) and (singing is singing is not good) Then (output is not leadership)
5. IF(Exercise is sports is not good) and (language is speaking well) and (communication is communication is very good) and (writing is writing well) and (singing is singing very well) Then (output is music)

4. Conclusion

Several conclusions can be made in light of the research findings, which are presented in the paper Determining Talent Based on Student Skills Using Fuzzy Logic, as well as the conversations that have taken place. These conclusions include the following:

1. Fuzzy logic approaches in decision support systems can be used to create a system that uses student skills to identify talent.
2. By selecting the best rule and acquiring five rules for using fuzzy logic to apply students' skills to identify the most dominant talent.
3. Based on the students' skill test results, five rules were established, and the kids with the highest scores were identified.

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