

Ability Assessment Competency Standards on Early Childhood with Fuzzy Logic Approac

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They reported that they had given a qualitative assessment to the individual students during their early childhood. This has been based on observations, previous information, and self-perceptions, and has been done by a list of questions to be filled in given a period of 10 to 15 minutes. The students' ability to identify and describe their own skills of computer use is not to be used as a final assessment of their skills. The purpose of this is to get the picture of assessment to be as realistic and objective as each teacher would have given different circumstances.

1.2. Problem Identification

The first step in problem identification is to determine what needs to be put in the assessment of the ability of the student of computer use and, secondly, what data from an education administration system can be used by using ICT-based approaches, namely the Face-Logit?

1.3. Objective

The objective of this study is to determine whether it is possible to use a learning process on Face-Logit in schools.

II. THE THEORETICAL BASIS

2.1. Early Childhood Education

Early childhood education is defined as education for children from birth to six years of age, which is a part of the education system. The purpose of early childhood education is to provide a foundation for the child's intellectual, physical, and social development. Early childhood education is a process that aims to provide a foundation for the child's intellectual, physical, and social development (Purwati, 2019: 20-21).

Early childhood education is a process that aims to provide a foundation for the child's intellectual, physical, and social development.

1. Formal education, which is a type of management education, namely Kindergarten (TK), Raudlatul Itqan (RA), or other equivalent forms.
2. Non-formal education, which consists of three types of management education, namely: Daycare (PAUD), PKB, and other equivalent forms.
3. Informal education, which is a type of management education, namely: Family Education, which is provided by the family.

2.2 Fuzzy Logic

Fuzzy Logic was first introduced by Lotfi Zadeh in 1965 and is a type of logic that allows for partial truth values. Unlike classical logic, which only has two truth values (true and false), fuzzy logic allows for a continuum of truth values between 0 and 1. This is useful for modeling human-like reasoning. The basic operations for fuzzy logic are union, intersection, and complement. The basic operations of fuzzy logic are the union of fuzzy sets, the intersection of fuzzy sets, and the complement of fuzzy sets.

2.3 Fuzzy Inference Systems (FIS)

Fuzzy Inference Systems (FIS) are used to model human-like reasoning. They consist of three main parts: a fuzzy inference engine, a fuzzy inference base, and a fuzzy inference controller. The fuzzy inference engine is the core of the FIS and is responsible for performing the fuzzy inference process. The fuzzy inference base is a collection of fuzzy rules that are used to perform the fuzzy inference process. The fuzzy inference controller is responsible for defuzzifying the output of the fuzzy inference engine.

The basic operations of fuzzy logic are:

1. Fuzzy union: $A \cup B = \max(\mu_A(x), \mu_B(x))$
2. Fuzzy intersection: $A \cap B = \min(\mu_A(x), \mu_B(x))$
3. Fuzzy complement: $\bar{A} = 1 - \mu_A(x)$
4. Fuzzy implication: $A \rightarrow B = \min(1, 1 - \mu_A(x) + \mu_B(x))$
5. Fuzzy equality: $A = B = \min(\mu_A(x), \mu_B(x))$
6. Fuzzy difference: $A - B = \max(0, \mu_A(x) - \mu_B(x))$
7. Fuzzy division: $A / B = \min(1, \mu_A(x) / \mu_B(x))$

III. METHODOLOGY

Some of the steps being taken in the implementation of fuzzy logic systems are:

1. **Define the fuzzy sets and fuzzy rules.**
The first step is to define the fuzzy sets and fuzzy rules. This is done by identifying the input and output variables and their possible values. The fuzzy rules are then defined based on the input and output variables.
2. **Establish the fuzzy inference engine.**
The next step is to establish the fuzzy inference engine. This is done by defining the fuzzy inference process, which involves performing the fuzzy inference operations on the fuzzy sets and fuzzy rules.

3. Membership Degree of multiple points

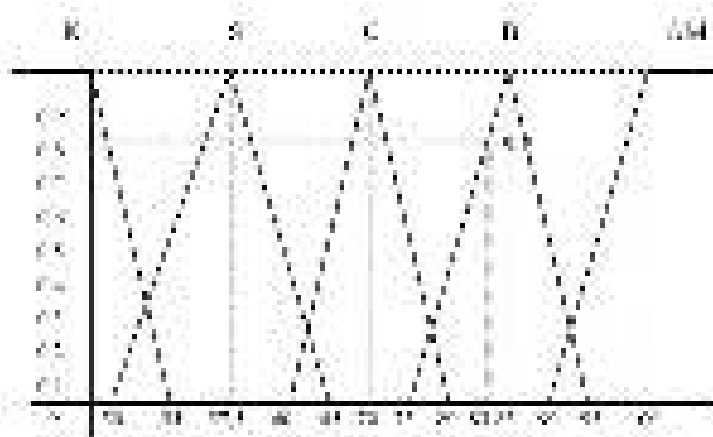


Figure 1.16: Membership Functions of linguistic variable, $x \in [0, 100]$

$$\mu_R(x) = \begin{cases} 1 & \text{if } x=0 \\ 0 & \text{if } x>0 \end{cases}$$

$$\mu_S(x) = \begin{cases} \frac{x}{25} & \text{if } 0 \leq x \leq 25 \\ 1 & \text{if } 25 < x \leq 50 \\ 0 & \text{if } x > 50 \end{cases}$$

$$\mu_C(x) = \begin{cases} 0 & \text{if } x < 25 \\ \frac{x-25}{25} & \text{if } 25 \leq x \leq 50 \\ 1 & \text{if } 50 < x \leq 75 \\ 0 & \text{if } x > 75 \end{cases}$$

$$\mu_H(x) = \begin{cases} 0 & \text{if } x < 50 \\ \frac{x-50}{25} & \text{if } 50 \leq x \leq 75 \\ 1 & \text{if } 75 < x \leq 100 \\ 0 & \text{if } x > 100 \end{cases}$$

$$\mu_{GH}(x) = \begin{cases} 0 & \text{if } x < 100 \\ 1 & \text{if } x=100 \end{cases}$$

Note: x is the value of the argument
 and the range value ranges
 from zero to one
 if the domain value is given

Example: Find the membership value of $x=37.5$ using following membership functions

4. Fuzzy Inference

Using Rule based inference engine using function following procedure

If (A is x_1 and B is x_2) then C is y where

$$\mu_C(y) = \min(\mu_A(x_1), \mu_B(x_2))$$

If x_1 is not a fuzzy set then $\mu_A(x_1)$ is a given value or x_1 is a fuzzy set and $\mu_A(x_1)$

denotes the membership value of x_1 in A . In following inference procedure using AND operator

we can find the membership value of y in C as a result. The membership value of the AND operator

can be obtained by using the min of membership value of x_1 and x_2 in the domain of C as we

considered. Similarly the value of the membership value of OR operator obtained by taking the largest

value of x_1 and x_2

$$\mu_{A \text{ OR } B}(x) = \max(\mu_A(x), \mu_B(x))$$

$$\mu_{A \text{ AND } B}(x) = \min(\mu_A(x), \mu_B(x))$$

Consider OR operator as an example

$$\mu_{A \text{ OR } B}(x) = \max(\mu_A(x), \mu_B(x))$$

2008/09

Assignment 1 (page 104) was completed on 20/01

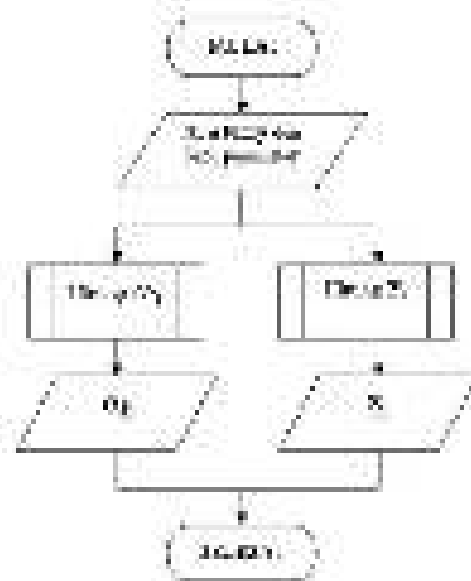
→ marks given in Assignment 1 (40/40)

→ marks given in QMS: 10/10

→ 40/40, 10/10

→ 50%

1. Explain the significance of the word 'theory' in the study of Biology. Do you agree or disagree with the statement 'The scientific approach to the study of life is based on the study of Theory, not just Models and Equations'.



2. Explain how the output stage of being mapping and the resulting paper is a range of numbers in 1. Assume that you are using 1. This process is the process of applying the appropriate number to the numbers, which also is the result of the process of being a number in 1. (10/10) (10/10)

IV. RESULT and DISCUSSION

4.1 Identification and Requirement

4.1.1 Analysis

The main concern of the course Teacher Progress Report system is determine the level of each development and behavior and the development of basic skills, language skills, cognitive, physical fitness, and etc. Conducted a qualitative assessment that is in the report output in the form of a numeric value in the form of narrative description. The results of the research can then be compared to the results of the system (Surya, 2007; Gunting, 2009; Dharma, 2009; Haryono, 2009; Haryono, 2009; Haryono, 2009; Haryono, 2009). The purpose of this research is to need a data management system that is an information system that will assist in evaluating for the research to identify all the data obtained to finally be used to enter each of the students' information. Already Ready or Not Ready to move into the next education.

4.1.2 Requirement

Need for the development of the information system, it is a fact that in the world of information technology, it has become a (crucial) role in companies, schools, and in the world of society. Evaluation of the student's skills, or at least to assess a basic education or used as a reference for teachers to concentrate more students to those who will get advanced course or class or class system (Surya, 2007; Gunting, 2009; Haryono, 2009; Haryono, 2009; Haryono, 2009).

4.2 System Requirements Analysis

4.2.1 Function

In this study, the information to build a system (Teacher Progress Report) that inputs to the system in the form of the following table:

NO	DEVELOPMENT PROGRAM		NO.	PROGRAM DEVELOPMENT	
	DATA	SUB PARAMETER		PARAMETER	SUB PARAMETER
I	1. Identification 2. Main Report	1. Identification	IV	1. Input data 2. Parameter	1. Input data
		2. Identification			2. Parameter description
		3. Identification			3. Data input parameter
		4. Identification			4. Data input parameter
		5. Identification			5. Data input parameter
		6. Identification			6. Data input parameter
		7. Identification			7. Data input parameter
		8. Identification			8. Data input parameter

<p>1. Unit Comprehension</p>	<p>1. Developmental Unit and Lesson Sequence 2. Objectives/Outcomes 3. Delivery mode/multiple Resources 4. Assessment- Reading Evaluation- Writing materials/resources 5. Materials/Tools for the unit 6. Timeline/Activities 7. Assessment of learning 8. Reporting to School School</p>	<p>1. Comprehension Physical Unit</p>	<p>1. Group presentation 2. Reading, writing and Drawing 3. Thinking, creative and critical 4. Speaking, reading 5. Learning to Write 6. Writing- Writing of the quality 7. Reading, writing, 8. Group presentation 9. Drawing</p>
<p>10. Comprehension Language</p>	<p>1. Objectives/Outcomes 2. Multiple choice questions 3. Fill in the blank and T/F questions, matching and multiple choice questions 4. All 5. Text books, worksheets 6. Self-learning 7. Diagnostic and Writing skills 8. Worksheets, assignments, 9. All skills</p>	<p>10. Language Unit</p>	<p>1. Reading 2. Learning to the form of Grammar 3. Multiple choice 4. Fill in the blank 5. True/False 6. Group presentation 7. Group presentation 8. Learning to the form of Grammar 9. All 10. Learning, for writing 11. Writing, drawing</p>

Table 1. Programme of Study for Grade 5, Curriculum 7-12

10.2.2. Content System

Despite our information system in the form of assessment of students in the form of a content, capability, industry level, a competency, indicators, by processing of students' log of performance and their learning needs and objectives

11. Process Design of Three Systems

11.1. Performance

In this study, to be conducted facilitated by a simulation which include: Competence based education, competence based course of regional language, competence based curriculum, competence based assessment, and competence based reporting system. It is more available resources and formal of design and design

11.2. Mathematics Education

In the mathematics education, simplified for a single variable to be processed by step approach and solution

–> $x + 2 = 3$ and $x - 2 = 3$ (Darmasari, 2011)

- a. $X = \text{rank(Linguistics)} - \text{rank(Language Computing)}$
- b. $Y = \text{rank(PSY)} - \text{rank(MC)$

Assume that both X and Y are normally distributed, as follows:

- $X \sim N(\mu_X = 100, \sigma_X = 10)$
- $Y \sim N(\mu_Y = 110, \sigma_Y = 5)$
- $\text{Cov}(X, Y) = 100(10)(5) = 5000$
- $\text{Corr}(X, Y) = 0.5$

- c. $Z = \frac{X+Y}{2}$
- d. K containing $Z_{0.05}, Z_{0.1}, Z_{0.5}$ and $Z_{0.9}$ with relationship function as follows in the picture below.

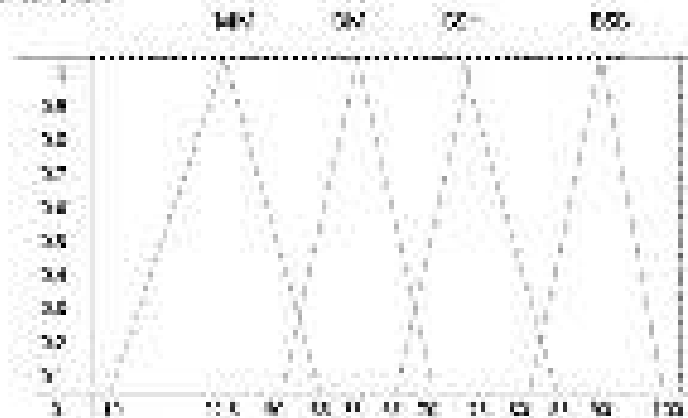


Figure 2. Relationship function of Z respectively

Figure 2 is showing the function relationship, according to the normal distribution function, which is used to determine the value of Z .

4.3.1. The Role of Data Mining

The main activities of data mining are **ETL** (Extract, Transform and Load) and **OLAP** (Online Analytical Processing).

The number of users is according to the number of articles published. The number of the development of the book is the figure of **PSY** and **MC** respectively. The data of course is a decision on the result of the response. As a result of the response, the number of articles published is the **rank(Linguistics)** and the number of articles published is the **rank(Language Computing)**. The number of articles published is the **rank(PSY)** and the number of articles published is the **rank(MC)**.

This role is based on the structure of the response training data of the current complex data. The role of the process is:

ETL	ETL (Extract, Transform and Load) process: The process of ETL (Extract, Transform and Load) process is the process of ETL (Extract, Transform and Load) process.	ETL (Extract, Transform and Load) process: The process of ETL (Extract, Transform and Load) process is the process of ETL (Extract, Transform and Load) process.
OLAP	OLAP (Online Analytical Processing) process: The process of OLAP (Online Analytical Processing) process is the process of OLAP (Online Analytical Processing) process.	OLAP (Online Analytical Processing) process: The process of OLAP (Online Analytical Processing) process is the process of OLAP (Online Analytical Processing) process.

4.4. Entry Calculations for the Standard of Competency in Speaking

4.4.1. Entry Points

According to the description of the standard of competency in speaking, the skills to be developed are:

- Name : ...
- No. of Item : 20 (10-10)
- Grade : B

NO	PROBLEMS DEVELOPMENT	VALUE	AVERAGE
I	9 Memorizing and Recalling Memorizing Memorizing		
	1. Memorizing Memorizing	75	77
	2. Memorizing Memorizing	75	
	3. Memorizing Memorizing	75	
	4. Memorizing Memorizing	80	
	5. Memorizing Memorizing	80	
	6. Memorizing Memorizing	80	
	7. Memorizing Memorizing	80	
8. Memorizing Memorizing	80		
II	9 Memorizing and Recalling Memorizing		
	1. Memorizing Memorizing	85	77
	2. Memorizing Memorizing	80	
	3. Memorizing Memorizing	80	
	4. Memorizing Memorizing	75	
	5. Memorizing Memorizing	80	
	6. Memorizing Memorizing	80	
	7. Memorizing Memorizing	75	
8. Memorizing Memorizing	80		
III	9 Memorizing and Recalling Memorizing		
	1. Memorizing Memorizing	75	77
	2. Memorizing Memorizing	75	
	3. Memorizing Memorizing	80	
	4. Memorizing Memorizing	75	
	5. Memorizing Memorizing	75	
	6. Memorizing Memorizing	80	
	7. Memorizing Memorizing	80	
8. Memorizing Memorizing	80		
IV	9 Memorizing and Recalling Memorizing		
	1. Memorizing Memorizing	80	82
	2. Memorizing Memorizing	80	
	3. Memorizing Memorizing	85	
	4. Memorizing Memorizing	85	
	5. Memorizing Memorizing	80	
	6. Memorizing Memorizing	80	
	7. Memorizing Memorizing	75	
8. Memorizing Memorizing	80		
V	9 Memorizing and Recalling Memorizing		
	1. Memorizing Memorizing	80	81
	2. Memorizing Memorizing	80	
	3. Memorizing Memorizing	80	
4. Memorizing Memorizing	80		

	2	Increasing Variable	75	
	3	Costing method (standard cost)	80	
	4	Volume Variance	75	
	5	Volume Variance (Standard Quantity)		
VI	Sales and Production Variances			
	1	Cost of Sales	70	75
	2	Advertising, Selling Expenses, etc.	75	
	3	Labour and material	75	
	4	Expense Reserve	80	
	5	Depreciation, Amortisation, Interest, etc.	75	
	6	Marketing expenses (excluding those included above)	80	
	7	Finance	80	
	8	Administrative and Finance overhead	75	

Table 1: Short-run production and administrative costs

4.1.3 The average value of the output price

The average value of the output price is the ratio of the total revenue (total cost) to the total of the values of the parameters in the demand function divided by the number of output quantities:

$$AVP = \frac{10,000 + 100Q + 0.001Q^2}{Q}$$

$$AVP = 10 + 100/Q + 0.001Q$$

$$AVP = 10 + 100/20 + 0.001 \cdot 20$$

$$AVP = 10 + 5 + 0.002$$

$$AVP = 15.002$$

$$AVP = 15.002$$

$$AVP = 15$$

4.1.4 The average value of the cost of the output price

The calculation of the average value of the output price is the result of the calculation of the average value of the output price as a function of the average value of the output price and cost of the output price.

a. Short-Run Cost Function: $TC(Q)$

$$TC(Q) = \begin{array}{l} 10,000 \\ + 100Q \\ + 0.001Q^2 \\ \hline 10,000 + 100Q + 0.001Q^2 \end{array}$$

$$TC(20) = 10,000 + 100 \cdot 20 + 0.001 \cdot 20^2 = 12,002$$

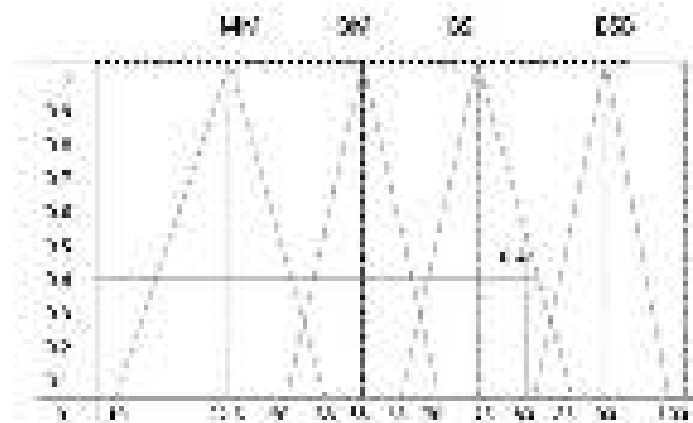


Figure 3. Membership functions for parameters of a Cubic Complex

- a) Base of a Complex: 15
 $\mu(15) = (1 - 75) / (15 - 75) = 0.8 = 0.8(50)$
- b) Top of a Complex: 75
 $\mu(75) = (75 - 75) / (95 - 75) = 0.0 = 0.2(50)$
- c) Right of a Complex: 90
 $\mu(90) = (90 - 82.5) / (92.5 - 80) = 0.9 = 0.5(50)$
- d) Height of a Complex: 0.4
 $\mu(0.4) = (0.4 - 0.2) / (0.4 - 0) = 0.5 = 0.1(50)$
- e) A 100 complex: 75
 $\mu(100) = (75 - 75) / (75 - 60) = 0.0 = 0.1(50)$

4.4. Inference process

In this process, the membership function of base property for system is combined. Further, it forms a new fuzzy set membership function. After that, fuzzy logic rules are used to find R_{11} , R_{12} , and R_{13} values.

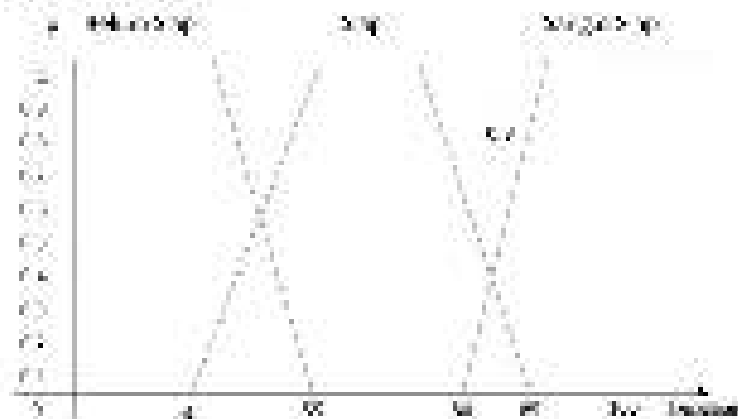


Figure 4. Triangular membership function for radius

2.2) defuzzifikasi :

Setelah didapat nilai-nilai fuzzy yang telah didapat, langkah selanjutnya adalah derajat keanggotaan dari nilai yang didapatkan kemudian akan dikalikan dengan nilai yang ada pada tabel yang sudah ada sebelumnya. Setelah itu akan dijumlahkan dan akan dibagi dengan jumlah dari semua nilai yang ada pada tabel yang sudah ada sebelumnya.

Generalisasi perhitungan untuk semua variabel dapat dilakukan.

Untuk data hasil perhitungan, membership function untuk variabel yang akan diolah akan diberikan hasil sebagai berikut.

Value Parameter	Revisi	TRC	MR	TDH	TRB
Value Defuzzifikasi Revisi	73	0	0	0,4	1
Value Defuzzifikasi TRC	74	1	0	0,4	1
Value Defuzzifikasi MR	77	0	0	0,2	0
Value Defuzzifikasi TDH	84	0	0	0,2	0,2
Value Defuzzifikasi TRB	71	1	1	0,5	1
Value Defuzzifikasi	75	0	0	0,3	0

Tabel 2. Hasil Data hasil perhitungan defuzzifikasi parameter.

$$\text{Revisi} = (1 \times 73) + (0 \times 77) + (0 \times 77) + (0,4 \times 84) + (1 \times 71) + (0,5 \times 75)$$

$$= (73 + 0 + 0 + 33,6 + 71 + 37,5)$$

$$= 225,1$$

$$= 75$$

$$= 75 \quad \text{[hasil defuzzifikasi TRC] 90,5}$$

Hal yang sama dilakukan dengan perhitungan untuk variabel lainnya, sehingga akan didapat hasil sebagai berikut. Adapun hasil perhitungan untuk variabel lain akan diberikan hasil sebagai berikut.

7. CONCLUSION AND SUGGESTION

7.1 Conclusion

The analysis of an empirical classroom for early child and education using factor analysis generally makes it easy for teacher to describe an object of research based on several variables of factor components because these two techniques implies so that there is uniformity in assessing the ability of the competence of each child in classroom, provide recommendations to the parents of children, and determine the value of each child in the classroom. In this research, the results of the factor analysis can be used to describe the ability of each child in the classroom, and can be used to describe the ability of each child.

7.2 Suggestion

The suggestion for the researcher is to carry out further research on applied learning, especially on how parents can be more involved in the learning process in the classroom, so that the child can be more able to learn. In this research, the researcher is also suggesting to the researcher to conduct further research on the ability of each child in the classroom.

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