

Analysis Of Priority Literacy Determination In Early Childhood Through Analytical Hierarchy Process (AHP)

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Abstract: Children's language development dramatically influences their literacy abilities. Appropriate literacy stimulation is believed to have a positive impact on children's literacy abilities. The purpose of this study is to determine the priority order of the most important criteria of literacy skills in children so that the priority order shows which criteria of stimulation should be optimized. This research is a qualitative descriptive study using the Analytical Hierarchy Process (AHP) approach. The AHP approach is carried out by analyzing the pairwise comparison analysis of each criterion. Analytical Hierarchy Process (AHP) is a decision-making system to determine priorities from 5 main criteria that play a role in developing children's literacy abilities. The five main principles studied, namely the understanding language, phonological awareness, basic reading skills, necessary writing skills, and reading motivation. By knowing the priority criteria, the development of early childhood literacy stimulation will be more effective. It means that it is necessary to develop a stimulation development model using the priority scale of completion. One of the best is to use AHP.

Keywords: literacy, early childhood, AHP, priority criterias

1. INTRODUCTION

According to Law Number 20/2003 concerning the National Education System Article 4, paragraph 5 states that education is carried out to develop the ability to read, write, and count for all members of the community. Reading is a strategy to get and access all the information needed in life. Reading ability gained at the start reading will be tremendously affect reading ability next. Reading is the foundation for teaching because, as a foundation, the reading skills must be strong and sturdy. Children's language development is an essential component in interpersonal growth and academic success [1]. According to [2], language development is related to speech development. The more able to speak, the more productive the language, the richer the language makes the child more confident to talk a lot. Children's literacy interest is positively related to achieving literacy. Literacy learning begins early in the lives of children [3]. Interest in literacy activities, especially for children, is strongly influenced by their home literacy environment [4]. During preschool, language skills develop rapidly, along with the need for socializing and curiosity. Children's literacy experience at preschool age is believed to form a strong foundation in reading development. Knowledge, skills, and attitudes of preschoolers that form the basis of reading and writing are called early literacy abilities [5]. In the era of disruption 4.0, it implies that all citizens of the world must be free from literacy [6]. It is also stated in the Education for All (EFA) program [7] revealed that "Reading is an extremely complex and multifaceted process ...". According to [8], the process of understanding reading is not simple. Several studies have shown that physical interaction and social interaction are essential indicators in the development of early literacy and literacy [9]. Educators, researchers, and policy makers pay more considerable attention to various literacy practices involving children and how they contribute to their literacy learning [10]. The introduction of early literacy in children must be an exciting and fun method. New technology also brings new opportunities for children to develop literacy outside the classroom [11]. According to a report from the IEA Study of Reading Literacy, the ability of elementary school children in Indonesia is still deficient,

ranking 30th out of 31 participating countries. According to OECD data [12], the literacy level of Indonesian people according to data [12] PISA in 2012 showed that Indonesia was ranked 64th out of 65 countries that followed with a score of 396 from the OECD average score of 496. The low literacy reading of Indonesia could be attributed to illiteracy rates in Indonesia are still high. In the era of massive technology and information like now, it still does not rule out the fact that millions of Indonesians are still illiterate. Illiteracy rates in Indonesia are still high, reaching 5,984,075 people [13]. Early childhood literacy development is a process of language development that begins at the time the child is born and continues to experience developed during his lifetime. Language development and children's literacy experience will determine the child's verbal literacy abilities in the future and academic success [14] [15]. Literacy activities that can be predictors are activities that are active, exploratory, and participating [16]. In this study, reading and writing abilities were measured by using an early literacy ability. It measures developed by [17], which contained 5 early childhood literacy criteria, namely language skills, phonological awareness, basic reading abilities, and basic writing skills and interest/reading motivation. The higher the score obtained by the subject, the higher the literacy ability. The lower the score achieved, the lower the score. Therefore it is necessary to study further how to determine the priority of criteria based on their preference because currently, many researchers consider all criteria to be critical. In this study, the order of criteria will be determined for the initial footing in optimizing, stimulating the development of children's literacy. The five criteria for the early literacy of the child is still very general. And in certain circumstances not seen which criteria can provide the greatest contribution in the development of early literacy of children. So we need an appropriate decision making in doing stimulation steps. Decision making is a common thing in life. Sometimes it is difficult to choose between the various options available. Decision making is not possible to rely solely on intuition alone but needs to be done through a systematic process. In the 1970s, Thomas L. Saaty developed a tool for decision making called the AHP (Analytic Hierarchy Process). AHP is one of the tools that facilitate us in making important

decisions. In principle, AHP helps in solving complex problems by using a hierarchy of criteria, assessed by interested parties (experts), and then concludes all considerations to develop weights or priorities. Some researchers have used this method in their research studies. It has been proven that decision making using AHP is quite objective and rational. The results of evaluations using the AHP method have proven to be more accurate, scientific, calculating intuition, and subjectivity [18]. AHP can develop school performance systems and can identify service elements that need the most improvement [19]. AHP is a decision-making system to determine priorities from 5 main criteria that play a role in developing children's literacy abilities. The AHP approach is carried out by analyzing the pairwise comparison analysis of each criterion. Based on the data above, it is necessary to find criteria that give the most important (primary) influence children's literacy abilities. The purpose of this study is to determine the priority of the vital literacy criteria to stimulate the children. Its priority order criteria will be used as a basis for optimizing literacy stimulation in children.

2. THEORETICAL BASIS AND LITERATURE REVIEW

2.1 Early Childhood and Learning

Early childhood is children aged from 0-6 years, who are in a stage of rapid growth and development, which has unique characteristics and have differences with later ages. According to [20], the social environment is very influential on children's development. First of all, children will experience and practice skills in a social context with peers and with adults, then become internal and become part of the child's development process [21]. Learning will occur when children associate new experiences they have with their previous experiences [22]. Children's literacy ability can be stimulated by playing. Play provides an essential contribution to the development of children [23]. Play provides an opportunity to develop children's mental and psychomotor abilities [24]. Play can be done both individually and in groups, teaching children to socialize and work together with their friends [25]. Play is also able to positively influence physical development, psychomotor, emotional, social, mental language development, and creativity [26]. Well-designed games allow children to develop physically and mentally, motivating children to live in peace with the community and themselves. The game positively affects the agility, endurance, balance, strength, speeds, abilities, skills, strength, rhythm, and mental development skills of children [27].

2.2 Literacy Ability

One of the figures who play a role in the concept of language ability is Caroll [28] who mentions that there are four skills approaches to the concept of language ability based on the assumption that the four skills are listening, reading, speaking, and writing. One of the determinants of children's learning success is optimal early literacy skills, so the ability to read and write in the early grades has a very important role. The recognition of reading and writing does not develop by itself but needs to be taught or introduced, so here the importance of stimulation from those around. If the literacy ability at the beginning is not strong, the reading

and writing stages will experience difficulties.

2.3 Components/Criteria for Early Childhood Literacy

Research on literacy in early childhood has been widely carried out, so many criteria can be used as a basis for developing literacy skills in children. According to [29], the essential literacy components include phonemic awareness, writing and story concepts, reading style, and literacy as socio-cultural activities. According to Snow [30], basic literacy skills are the capacity to name letters and write and spell simple words. It also includes recognizing letters and signs around, identifies books from titles, and carry out activities related to books. [31] states the literacy abilities of preschoolers can be grouped into six types, namely the ability to tell, motivation to read the writing, vocabulary, phonological awareness (letter sounds), knowledge of letters, and awareness of writing. [32] divides basic literacy skills into three: print knowledge, the basics of writing (emergent writing), and reading interest. Research [33] said 11 variables could consistently predict reading achievement. The variables include the letter knowledge, phonological awareness, recognizing letters and objects (rapid automatic naming), writing letters and names themselves, phonological memory, besides that the concept of writing, written knowledge, reading readiness, spoken language, and visual processes. Essential components in basic literacy are knowledge literacy, literacy skills, and literacy behavior. The literacy knowledge component includes an understanding of print, letters; Literacy skills are listening comprehension, narrative, and oral language skills (vocabulary mastery). The literacy or metalinguistic skills include morphology, phonology and semantics, early literacy activities, including first reading and writing skills [34]. Furthermore, in this study, researchers used the initial literacy component that was developed by [17], which included five different components. The components include the ability to understand language, sharpness in distinguishing phonemes/phonological awareness, basic reading skills, d) ability basic writing, interest/motivation to read. This research will determine the order of the literacy component based on expert opinion so that later, it will become the optimal stimulation literacy footing that will be given to children.

2.4 Analytical Hierarchy Process (AHP)

The analytical hierarchy process (AHP) is a layered hierarchical structure developed for decision making [35]. Several studies on AHP have been conducted, namely research [36] entitled "A Study of Investigating Adolescents' Eating out Behavior by Using Analytic Hierarchy Process." The purpose of this study is to look at what factors influence adolescent eating behavior habits and develop scientific principles in the selection of factors that influence eating behavior outside adolescents. The research results are quite useful. It also can be used as important references for curriculum design, nutrition education content and adolescent consumer education, as well as advice on relevant planning that can be provided to administrative and health units. Further research is research conducted by [37] entitled An AHP-Based Weighted Analysis of Network Knowledge Management Platforms for Elementary School Students. The purpose of this study is to measure important knowledge management behaviors and to analyze

behavioral weighting scores of elementary school students. The model developed in this research can be used as a reference for future studies to evaluate the performance of elementary school students in network knowledge management behavior.

Some of the advantages of AHP include:

- 1) Unity, that is, AHP makes broad and unstructured problems into a model that is flexible and easy to understand.
- 2) The complexity that is, AHP solves complex problems through a system approach and integrating deductively.
- 3) Interdependence (AHP) that is AHP can be used on system elements that are free and do not require linear relationships.
- 4) Hierarchy Structuring that is AHP represents natural thinking, which tends to group system elements into different levels from each level containing similar aspects.
- 5) Measurement The AHP provides a scale of analysis and methods to get priority.
- 6) Consistency, the AHP considers logical consistency in the assessment used to determine priorities.
- 7) Synthesis, which is AHP, leads to an overall estimate of how desirable each alternative is.
- 8) Trade-Off AHP considers the relative priority of factors in the system so that people can choose the best option based on their goals.
- 9) Judgment and Consensus AHP does not require a consensus but combines different assessment results.

The AHP Process Repetition can make people refine the definition of a problem and develop their judgment and understanding through the process of repetitive

The steps in the AHP method are as follows:

- 1) Define the problem
- 2) Establish priority elements
- 3) Synthesis
- 4) Calculate the consistency of the Index (CI) with the formula $CI = (\lambda_{max} - n) / (n-1)$
- 5) Calculate the Consistency Ratio (CR) with the formula: $CR = CI / RI$
If $CR < 0.1$, then the pairwise comparison values in the given criteria matrix are consistent.
If $CR \geq 0.1$, the pairwise comparison values in the given criteria matrix are not consistent. So if it is not consistent, then filling in the values in the paired matrix on the criteria element must be repeated.
- 6) The final result is a global priority as the value used by decision-makers based on the highest value

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Vol. 6 | No. 2 | Jul-Desember 2018 327 calistung memang merupakan fenomena tersendiri. Kini menjadi semakin hangat dibicarakan para orang tua yang memiliki anak usia (TK) dan sekolah dasar karena mereka khawatir anak-anaknya tidak mampu mengikuti pelajaran di sekolahnya nanti jika sedari awal belum dibekali keterampilan membaca. Kekhawatiran orang tua pun makin mencuat ketika anak-anaknya belum bisa membaca menjelang masuk sekolah dasar. Hal itu membuat para orang tua akhirnya sedikit memaksa anaknya untuk belajar calistung. Menurut Depdiknas (2000:2), Taman Kanak-kanak didefinisikan sebagai tempat untuk mempersiapkan anak-anak memasuki masa sekolah yang dimulai di jenjang sekolah dasar. Kegiatan yang dilakukan di taman kanak-kanak hanya bermain dengan menggunakan alat-alat bermain edukatif. Pelajaran membaca, menulis, dan berhitung tidak diperkenankan di tingkat Taman Kanak-kanak, kecuali hanya pengenalan huruf-huruf dan angka-angka, itu pun dilakukan setelah anak-anak memasuki TK BPrinsip pembelajaran lainnya adalah berorientasi pada perkembangan dan kebutuhan anak; berpusat pada anak; lingkungan yang kondusif; menggunakan pembelajaran terpadu; mengembangkan berbagai kecakapan hidup; menggunakan berbagai media edukatif dan sumber belajar; dilaksanakan secara bertahap dan berulang-ulang; aktif, kreatif, inovatif, efektif, dan menyenangkan; serta pemanfaatan teknologi informasi (Depdiknas, 2007: 2-4) Prinsip pembelajaran lainnya adalah berorientasi pada perkembangan dan kebutuhan anak; berpusat pada anak; lingkungan yang kondusif; menggunakan pembelajaran terpadu; mengembangkan berbagai kecakapan hidup; menggunakan berbagai media edukatif dan sumber belajar; dilaksanakan secara bertahap dan berulang-ulang; aktif, kreatif, inovatif, efektif, dan menyenangkan; serta pemanfaatan teknologi informasi (Depdiknas, 2007: 2-4)

3. Research Method

This research is correlational research and evaluation using the AHP approach. The AHP approach is carried out by analyzing the pairwise comparison analysis of each criterion. It means that it is necessary to develop a stimulation development model using the priority scale of completion. Based on the data above, it is required to look for criteria that have the most important influence on children's literacy abilities. In the area of decision making, the concept of priority is classic, and how priority is obtained influences the choices made.

4. RESEARCH RESULT

The first step is defining the problem

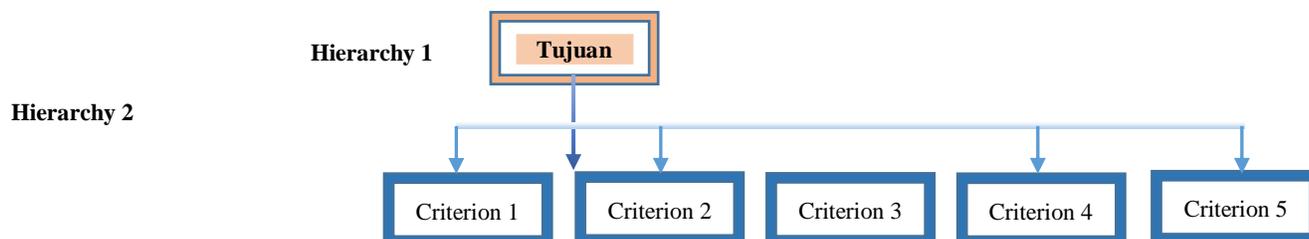


Figure 1. Define the problem.

The main hierarchy (Hierarchy I) is the goal/focus/ goal to be achieved or the resolution of the problem/problem being studied. The second hierarchy (Hierarchy II) is a criterion, what criteria must be met by all alternatives (settlement) to be eligible to be the ideal choice. The five criteria for the early literacy of the child are still very general. So that a correct decision is needed in determining the order of the

highest criteria so that later it will become the basis for optimal literacy stimulation that will be given to children. The pairwise comparison assessment procedure in AHP refers to the assessment score developed by Thomas L. Saaty, as follows:

Table 1. The base scale of pairwise comparisons.

Intensity The importance	Information
1	Both criteria are equally important
3	Criteria A is slightly more important than criterion B
5	Criterion A is more important than criterion B
7	Criteria A is clearly more important than criterion B
9	Criteria A is absolutely more important than criterion B
2,4,6,8	The values between two adjacent balances

Table 2. Criteria type.

Criteria Type	Information
Criterion 1	Ability to Understand Language
Criterion 2	Phonological Awareness
Criterion 3	Basic Reading Skills
Criterion 4	Basic Writing Skills
Criterion 5	Reading Interest / Motivation

$$GM = \sqrt[n]{(X1)(X2) \dots (Xn)} \tag{1}$$

Matrix Preparation and Competency Test

At this stage, the questionnaire was distributed to experts to obtain valid information relating to the order of the children's literacy components. Experts/experts involved in weighing criteria for early childhood literacy are 12.5% Professors (Professors), 62.5% lecturers hold Doctor degrees with appropriate competencies, and 25% of practitioners working in early childhood education. The second step is to bring together the opinions of several experts using the ordinary geometry equation:

Where:

- GM = Geometric Mean
- X1 = 1st Expert; X2 = 2nd Expert;
- Xn = nth Expert

Third step: compile the comparison matrix as follows:

Table 3. Comparison matrix.

Criterion	1	2	3	4	5
1	1	2.43	1.29	1.57	3
2	0.412	1	2.326	1.71	3.14
3	0.775	0.43	1	0.280	2.29
4	0.637	0.584	3.57	1	3.57
5	0.333	0.318	0.437	0.280	1
Amount	3.157	4.763	8.622	4.840	13

The fourth step calculates the normalized Eigen factor by calculating the value of each row divided by the final number in the column

- Column 1 row 1 = 1 / 3.157 = 0.317
- Column 1 row 2 = 0.142 / 3.157 = 0.130
- Column 1 row 3 = 0.775 / 3.157 = 0.246

Column 1 row 4 = 0.637 / 3.157 = 0.202
 Column 1 row 5 = 0.333 / 3.157 = 0.106 and so on, so that the Eigen Value / Normalization table can be seen in Table 4

Table 4. Normalization / eigen factor.

Criterion	Normalization / Eigen factor					Amount	Average	The ranking
	1	2	3	4	5			
1	0.317	0.510	0.149	0.324	0.231	1.532	0.306	I
2	0.130	0.209	0.269	0.353	0.242	1.205	0.241	III
3	0.246	0.090	0.116	0.058	0.176	0.686	0.137	IV

4	0.202	0.123	0.414	0.207	0.275	1.219	0.243	II
5	0.106	0.067	0.051	0.058	0.077	0.358	0.072	V
								1

In the column, the average value is summed, and the result must be one. Number one means the calculation is correct, but if not, the calculation is wrong and must be repeated. In Table 5, the average 1 meaning the calculation is correct but not necessarily consistent. To see the calculation is consistence, then the consistency calculation must be observed by using the Consistency Ratio (CR).

The fourth step is to calculate the CI (Consistency Index).

$$CI = (\text{lamda max-n}) / (n-1); \text{ where } n = \text{the number of criteria (5)}$$

$$\text{Lamda} = (3.157 \times 0.306) + (4.763 \times 0.241) + (8.622 \times 0.137) + (4.840 \times 0.243) + (13 \times 0.072) = 5,409$$

$$CI = (5,409-5) / (5-1) = 0.102$$

To see the IR (Index Ratio) commonly used for each order are as follows:

Table 5. Ratio index.

Matriks Order	1	2	3	4	5	6	7	8	9	10
RI	0,00	0,00	0,58	0,90	1,12	1,24	1,32	1,41	1,45	1,49

Where n = 5 criteria so that the IR at 1.12

The fifth step is to calculate the CR (Consistency Ratio).

$$\text{Then : } CR = CI / IR = 0.102 / 1.12 = 0.091$$

(consistent) because it is less than 0.1

So based on the above analysis, the priority of children's literacy abilities can be presented in the following table:

Table 6. Children's literacy ability criteria based on priority.

No.	Criterion	Score	The ranking
1.	Ability to understand language	0.306	Main priority
2.	Basic writing skills	0.243	Second priority
3.	Phonological awareness	0.241	Third priority
4.	Basic reading skills	0.137	Fourth priority
5.	Reading interest / motivation	0.072	Fifth priority

DISCUSSION

From table 6, it can be seen that the priority of the first (first) order in the literacy component of children is the criteria of being able to understand language (0.306). Language is a very important communication tool important for children because children can express all their wants and needs through language. The learning process is mediated by language. Therefore literacy ability is always preceded by the development of language [17]. The second priority is basic writing skills (0.243). The basic ability to write is the second most important criterion after language skills. It is in accordance with research from [33], which states that the basics of writing, print knowledge, and interest in reading are critical criteria developed in basic literacy in children. The earliest forms of writing produced by children are scribbles and drawings. Writing skills are facilitated by the teacher with fine motor activities using various materials in the class including markers, stamps, chalk, scissors, paper, pencils, pens, paints, crayons, blackboard chalks, picture dictionaries, sticks, etc. [38] [39]. The third-order priority is the criteria for phonological awareness (0.241). Phonological awareness is the level of sensitivity a child has of sound structure in oral language [40]. Phonological awareness of the child is to know the relationship between oral language and the text that represents it [41]. Good phonological awareness will have a positive impact on

children's literacy abilities. The weak phonological awareness results in children experiencing reading disabilities or reading disabilities [42]. The fourth priority is the basic ability to read (0.137). According to Snow [43], the basic ability to read in early childhood is the ability to name letters and write them down, spell simple words, recognize letters and signs around, identify books and titles and carry out activities related to books. The fifth priority is reading interest/motivation (0.072). The quality of effective interactions when reading books to children is the most potent indicator of the emergence of children's interest or motivation to learn. The development of children's vocabulary and spoken language is related to the closeness of children to books. It means that children who have high motivation/interest in books will have a positive impact on the development of their vocabulary and spoken language.

5. CONCLUSIONS

The discussion that has been presented in this paper concludes that the use of the AHP method is very effective and efficient in helping to determine the priority criteria to be developed. The conclusion of the AHP analysis and weighting above can be concluded that the criteria can understand language (0.306). This is because of the ability to understand language will underlie the ability to read, so the main space for stimulation of children for literacy needs to be through the emphasis on the ability to understand

language. The basic ability to write (0.243) and phonological awareness (0.241) can be developed together. Basic reading ability (0.137) and reading interest/motivation (0.072) are the criteria that become the next priority. For achieving optimal results, the development of children's literacy needs to be followed by determining the performance indicators in each criterion. The linkage between the priority indicators for each criterion will be very interesting to follow up so that the increase in stimulation in the development of early childhood literacy can run effectively in the future.

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