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Intercorrelation of Factors which Determine the Quality of Early Childhood Education

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ABSTRACT

This research aims to describe the intercorrelation between various components of early childhood education (PAUD) quality. The study was conducted on 43 PAUD institutions in the districts of Manggarai, West Manggarai, and East Manggarai. Data were collected using a questionnaire consisting of 50 questions that covered various scopes of SNP-AUD. The study's results showed that the Teacher and Education Personnel standard was a significant determinant factor in determining children's growth and development, with a determinant coefficient of 83.7%. However, this factor's determination was not direct but through its correlation with other factors within the process component. Therefore, efforts to improve PAUD teacher qualifications, competencies, and quality need to be done simultaneously and comprehensively with various aspects that determine PAUD process quality, such as improving the ability to develop and design a contextual curriculum, improving pedagogical abilities and learning strategies, as well as improving the ability to accurately and meaningfully assess children's development.

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1. INTRODUCTION

The issue of quality in Early Childhood Education units has become a matter of concern for various parties. In response to this concern, since 2019, the BAN PAUD (National Accreditation Board for Early Childhood Education) and PNF (National Education Standards Agency) have taken a more proactive approach in implementing accreditation measures. This move aims to address the growing need for ensuring the quality of Early Childhood Education units, which has become even more crucial due to the significant increase in the number of such units. By implementing accreditation, these organizations strive to maintain and enhance the standards of Early Childhood Education, ultimately benefiting the education and development of young children. From 2016 to 2020, the Ministry of Education and Culture recorded an increase in the number of Early Childhood Education units of around 8,000 each year.

The increase in the number of Early Childhood Education units needs to be balanced with the presence of a quality assurance system, both external and internal. Quality assurance that has been implemented in Early Childhood Education units is only in the form of external quality assurance known as accreditation. The accreditation that has been carried out by various Early Childhood Education units should not only provide assurance of education quality but also have an impact on efforts to improve the quality of Early Childhood Education units. Therefore, the process and output of accreditation need to be a reflection material for each education unit to determine the determinant factors that greatly affect the quality of Early Childhood Education units.

In the education management system, the quality components of education can be classified into input, process, and output components. These three components should be viewed as a system with intercorrelations. The Input component of education includes all factors that affect education, such as the curriculum, human resources, material resources, and infrastructure. The Process component of education refers to all activities carried out in the classroom, such as teaching, learning, and evaluation. The education process includes the relationship between teachers and students, teaching methods applied, and learning methods and strategies used (Artha et al., 2013). The Output component can be semantically interpreted as a result or product. If taken into the understanding of educational output, it means a result achieved by an educational institution. The output of an educational institution can be seen or measured by its quality, effectiveness, productivity, efficiency, and innovation.

Every quality standard for educational units, both external and internal, always considers and relates to the input, process, and output components of education. The same applies to the National Standards for Early Childhood Education. In Minister of Education Regulation 137 of 2014, there are 8 national standards for early childhood education. namely the Standards for Children's Developmental Achievement Levels, Content, Process, Educators and Educational Personnel, Facilities and Infrastructure, Management, Financing, and Assessment. Explain their relationship with the input, process, and output components.

Based on the definition of the input, process, and output components and the coverage aspects of each National PAUD Standard, these 8 standards can be classified into input, process, and output components. The input component may consist of the Educators and Educational Personnel, Facilities and Infrastructure, Management, and Financing standards. The Process component consists of the Content, Process, and Assessment standards. Meanwhile, the Standard for Children's Developmental Achievement Levels can be grouped as an output component.

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In determining the quality of education, each standard component cannot be viewed in isolation. Each component needs to be seen as a related system. Therefore, efforts to improve the quality of the PAUD unit also need to pay attention to the intercorrelation of these various standard components. For example, a good PAUD curriculum must be supported by quality educators and a conducive learning environment. This can help children learn more maximally and effectively. In addition, parents also need to be involved in their children's learning process, so they can facilitate the learning process at home.

In this context, it is important for the government and educational institutions to ensure that all components of early childhood education are well-met. This can help improve the overall quality of early childhood education. There is some supporting evidence for the intercorrelation of early childhood education components. Nugrahaeni, Haryanto, and Hendriani (2019) proved that there are several determinant factors that influence PAUD quality, including teacher professionalism, learning environment, parental support, and the availability of books and learning media. From their research, Nugrahaeni, et al. proved that teacher professionalism has a significant positive correlation with PAUD education quality ($r = 0.646$, $p < 0.05$), as well as the learning environment ($r = 0.628$, $p < 0.05$), parental support ($r = 0.616$, $p < 0.05$), and the availability of books and learning media ($r = 0.595$, $p < 0.05$). Furthermore, research conducted by Yusuf and Mursid (2020) showed intercorrelation between early childhood education components. The results of the study showed that the implementation of the SNP-AUD can help PAUD institutions design integrated and holistic learning programs, thus improving the quality of educational services provided to young children.

The research by Asyikin, Kusnadi, and Sutadji (2020) also confirms the existence of intercorrelations between the components of early childhood education quality. The study was conducted on 121 early childhood education institutions in the Cilacap District and the data analysis showed a significant positive correlation between the quality components of education, namely human resources, facilities and infrastructure, learning processes, and learning outcomes. The research results indicate that the quality of early childhood education not only depends on one component, but there is a relationship between these components in influencing the overall quality of early childhood education.

From these studies, it can be clearly stated that there is a significant intercorrelation between the components of early childhood education quality. Therefore, efforts are needed to strengthen the interaction between these components in order to improve the quality of early childhood education.

2. METHODS

Several previous studies on the intercorrelation of quality components in Early Childhood Education (PAUD), which have been presented in the introduction, explain the partial interrelationships between the components. This study analyzes these intercorrelations as a system using a quantitative approach. The type of research used is correlational research, and the analytical technique used is path analysis.

The researcher describes the intercorrelation between various quality components of PAUD based on independent variables, mediators, and dependent variables. The study was conducted on 43 PAUD institutions located in the districts of Manggarai, West Manggarai, and East Manggarai. Data was collected using a questionnaire. The questionnaire instrument was based on 8 PAUD standards, with each standard detailed according to its related scope. The questionnaire consisted of 50 statements, and responses were recorded on a Likert scale,

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with each statement described according to its specific substance. The data was analyzed using path analysis to examine the direct and indirect effects of each PAUD quality component. The analysis was performed using JASP software. Before the analysis, the researcher converted the data type from ordinal to interval data using the Successive Interval Method (MSI).

3. RESULTS AND DISCUSSION

This study aims to describe quantitatively the intercorrelation between various quality components of Early Childhood Education (PAUD) based on 8 PAUD standards (SNP-AUD). Data was collected from 43 institutions located in Manggarai, East Manggarai, and West Manggarai districts in East Nusa Tenggara (NTT). The number of PAUD institutions sampled based on their accreditation status can be seen in **Table 1.**

Table 1. Number of sampled PAUD institution.

Accreditation Status	Frequency	Percent	Valid Percent
A	4	9.302	9.302
B	26	60.465	60.465
C	7	16.279	16.279
Not Accredited	6	13.953	13.953
Total	43	100.000	

Based on the data collected from the 43 PAUD institutions, a description of the quality of the institutions was obtained based on the SNP-AUD, as well as an overview of the intercorrelation coefficients between various quality components. A description of the quality of the institutions based on the 8 SNP- AUD can be seen in the following graph in **Figure 1.**

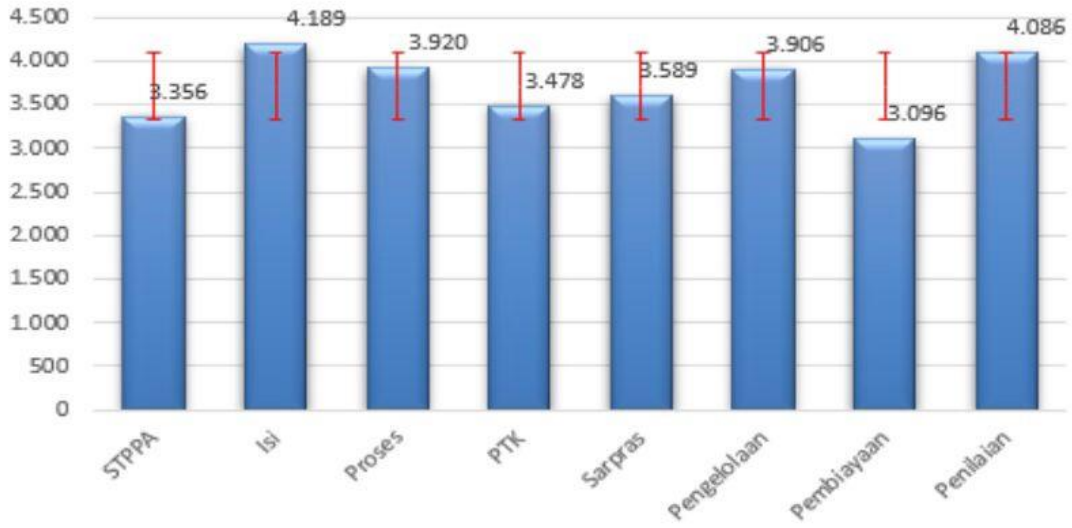

Figure 1. Mean and standard deviation of PAUD quality based on 8 SNP-AUD.

The description of the averages in Figure 1 can be presented based on the quality components of education (input, process, and output). In the input component (teachers, facilities, management, and financing), it appears that the teacher standard and financing

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standard received lower averages compared to other standards in the same component. In the process component (content, process, and assessment), the average process standard is lower compared to other standards in the same component. In this component, the content standard received a higher rating compared to other standards.

Meanwhile, the STPPA (Standard for Child Development Achievement Level) which is an output component received lower averages compared to other standards in both input and process components. This condition indicates that the impact of PAUD units on the growth and development of children in Manggarai, Manggarai Barat, and Manggarai Timur districts is not yet optimal, and the achievement is lower compared to the input and process aspects of education.

In this study, in addition to describing the achievement data for each standard, the researchers also showed the intercorrelation between the PAUD quality standards. This analysis was carried out using the path analysis technique. This analysis is intended to obtain information on the correlation coefficients between various PAUD quality components, both direct and indirect effects. The input component consists of teacher standards, facilities (Srp), management standards (Png), and financing standards (Pmb). The process component consists of content standards, process standards (Prs), and assessment standards (Pnl), while the output component only consists of one standard, namely the Standard for Child Development Achievement Level (STP). Description of the path model resulting from the analysis can be seen in the **Figure 2.**

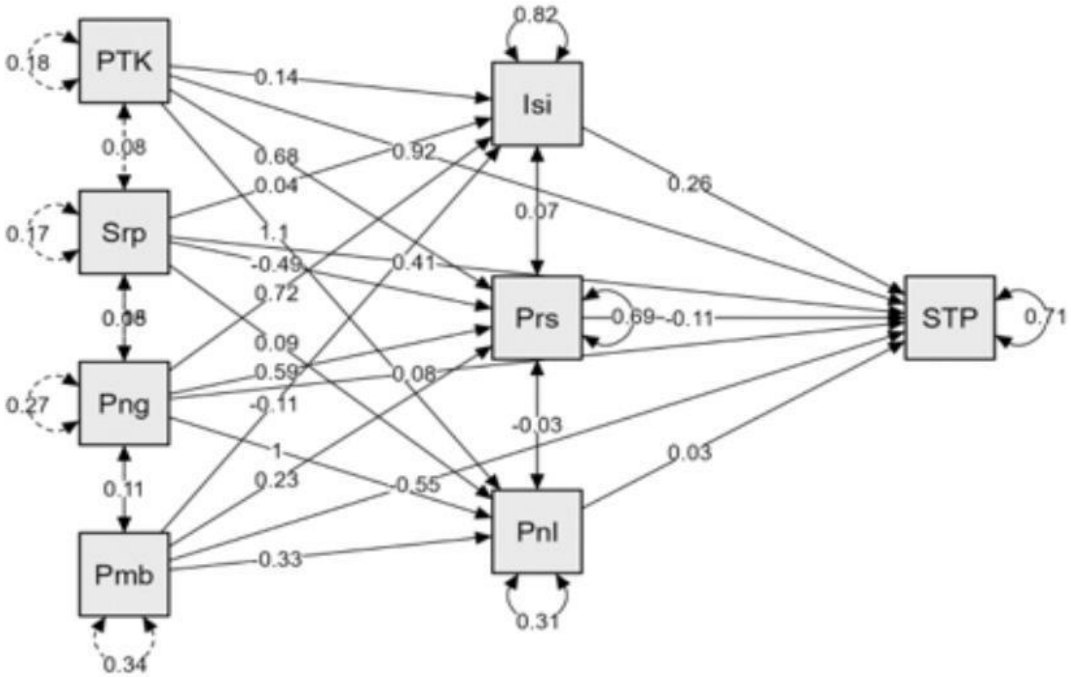

Figure 2. Inter-correlation path model among SNP-AUD Quality Components.

The paths shown in Figure 2 explain that each PAUD standard present in the input and process components needs to be viewed systematically and comprehensively regarding its contribution to the Standard of Developmental Achievement Level of Children (output component). The contribution of each component is described based on its direct effect, indirect effect, and total effect. In this case, the input component is viewed as an independent

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variable, the process component as a mediator variable, and the output component as a dependent variable. Based on this grouping, the contribution of the input and process components to the output component can be explained in **Table 2.**

Table 2. Direct effect of input component on output component.

						95% Confidence Interval	
		Estimate Std.	Error	z-value	P	Lower	Upper
PTK	→ STPPA	0.918	0.514	1.785	0.074	-0.090	1.926
Sarpras	→ STPPA	0.412	0.373	1.106	0.269	-0.318	1.143
Pengelolaan	→ STPPA	0.077	0.395	0.194	0.846	-0.697	0.851
Pembiayaan	→ STPPA	-0.546	0.296	-1.846	0.065	-1.125	0.034

Note. Delta method standard errors, normal theory confidence intervals, ML estimator

Based on the p-value of each input component's contribution to the output, it can be seen that the p-value of all input components > 0.05. This value indicates that there is no significant direct influence between input components and the level of achievement of children's development (STPPA). The findings contradict Siregar's research, which proved that teacher quality, curriculum, and school facilities significantly affect student learning achievements (Siregar, 2021). Theoretical understanding suggests that input components can indeed have a direct impact on output components in education, although this relationship is not always straightforward. It is important to acknowledge the existence of mediator variables that can influence this relationship. Factors such as students' individual characteristics, the family environment they come from, and their socio-economic conditions can also play a significant role in shaping the quality of educational output.

A study by Khan and Hussain found that although input factors such as teacher quality and curriculum can affect output quality, external factors such as parents' education and family income significantly affect student academic achievement (Khan and Hussain, 2011). The findings of Khan and Hussain's study underscore the importance of recognizing the broader contextual factors that can shape educational outcomes. Parents' level of education can have a profound influence on their children's educational attainment. Higher levels of parental education often correlate with increased involvement in their children's education, access to educational resources, and a supportive home learning environment. Similarly, family income can affect the availability of educational opportunities and resources, which can significantly impact students' academic performance.

These external factors, linked to the learning process component, highlight the need to consider the wider socio-economic context in understanding educational achievement. By acknowledging the influence of parents' education and family income, education stakeholders can develop targeted strategies to mitigate disparities and provide support to students who may face additional challenges due to their socio-economic circumstances.. Therefore, in addition to reviewing the direct effect, analysis of the input component's contribution also needs to be examined based on its mediator variable, the education process component. Series of significance values of input components on output through the mediating variable, the process component can be seen in **Table 3.**

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Table 3. Indirect effect input component on output component.

							95% Confidence Interval	
			Estimate Std.	Error	z-value	P	Lower	Upper
PTK	Isi	→ STPPA	0.036	0.122	0.294	0.764	-0.204	0.276
PTK	Proses	→ STPPA	-0.072	0.115	-0.625	0.532	-0.298	0.154
PTK	Penilaian	→ STPPA	0.033	0.261	0.128	0.898	-0.478	0.544
Sarpras	Isi	→ STPPA	0.011	0.103	0.112	0.911	-0.190	0.213
Sarpras	Proses	→ STPPA	0.051	0.085	0.606	0.544	-0.115	0.217
Sarpras	Penilaian	→ STPPA	0.003	0.023	0.122	0.903	-0.043	0.049
Pengelolaan	Isi	→ STPPA	0.188	0.134	1.404	0.160	-0.074	0.450
Pengelolaan	Proses	→ STPPA	-0.062	0.096	-0.643	0.520	-0.250	0.127
Pengelolaan	Penilaian	→ STPPA	0.032	0.247	0.128	0.898	-0.452	0.515
Pembiayaan	Isi	→ STPPA	-0.029	0.082	-0.353	0.724	-0.189	0.131
Pembiayaan	Proses	→ STPPA	-0.025	0.047	-0.526	0.599	-0.117	0.067
Pembiayaan	Penilaian	→ STPPA	-0.010	0.078	-0.128	0.898	-0.162	0.142

Note. Delta method standard errors, normal theory confidence intervals, ML estimator

Based on the data available, it appears that none of the values show a significant impact of input components on output, even through the process component. All significance values (p-values) are >0.05. This data explains that the input components of education (teachers, facilities, management, and financing) do not affect STPPA even through the process components (content, process, and learning assessment).

Darling-Hammond explains this condition based on the input-process-output educational paradigm. According to this paradigm, the quality of educational output depends on the quality of educational input received and experienced by learners. For example, low-quality educators and curriculum can hinder learners' ability to learn and obtain good educational output (Darling-Hammond, 2010). Darling-Hammond's explanation also affirms that the quality of educators and PAUD curricula in the districts of Manggarai, West Manggarai, and East Manggarai is still relatively low, so it has not had an impact on the growth and development of children.

On the other hand, the total effect analysis shows a slightly different conclusion. The concept of total effect in path analysis can be interpreted as the direct and indirect influence of independent variables on the dependent variable through a mediator variable. Total effect can be calculated by summing up all direct and indirect effects of independent variables on the dependent variable (Bolin, 2014). In the context of this research, the total effect was analyzed by summing up all the direct and indirect effects of input components (teachers, facilities, management, and financing) on output components (STPPA). The results of the total effect analysis are shown in **Table 4.**

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Table 4. Total effect input component on output component

						95% Confidence Interval	
		Estimate Std.	Error	z-value	P	Lower	Upper
PTK	STTPA	0.915	0.447	2.049	0.040	0.040	1.791
Sarpras	STTPA	0.478	0.380	1.257	0.209	-0.267	1.223
Pengelolaan	STTPA	0.234	0.307	0.764	0.445	-0.367	0.836
Pembiayaan	STTPA	-0.609	0.296	-2.056	0.040	-1.190	-0.028

Note. Delta method standard errors, normal theory confidence intervals, ML estimator

Based on the data in Table 4, the p- value of PTK and funding towards STPPA is 0.040. This value is smaller than 0.05. Thus, it can be concluded that PTK and funding, when calculated based on their direct and indirect effects, have a significant contribution to STPPA. The total effect of PTK on STPPA is 0.915 or has a determination towards STPPA of 83.7%. This high determination and significance indicate that the output component of early childhood education (STPPA) can only improve if the Education Personnel Standards (PTK) and the quality of the early childhood education process components (curriculum standards, process, and assessment) are improved.

This finding also confirms that teacher and learning processes together contribute to student learning outcomes. Teachers are the main factor that significantly contributes to student learning outcomes. Qualifications, skills, and teaching experience are factors that contribute to improved learning outcomes (Arnold, 2011). In addition, the curriculum (content standards) also contributes to student learning outcomes. A well-structured curriculum can help students achieve learning objectives. The learning process also contributes to student learning outcomes. Effective learning processes, including active interaction between teachers and students, can improve student learning outcomes (Arnold, 2011).

The path analysis findings in this study and several relevant studies indicate that to improve the quality of early childhood education output components, systemic and comprehensive actions need to be taken. These actions can start with improving the qualifications and competencies of teachers. The improvement of teacher qualifications and competencies should also be accompanied by improving the quality of early childhood education content standards, process, and assessment. These efforts cannot be done partially but must be done comprehensively and simultaneously to maximize the quality of the output. This recommendation is in line with the view that "To improve the quality of early childhood education, factors such as teacher quality, a curriculum suitable for children's needs, structured learning processes, and integrated assessment with learning need to be considered" (Rokhmah, 2018).

4. CONCLUSION

The education quality component paradigm, consisting of input-process- output, cannot be viewed partially or separately. Each component needs to be viewed in relation to the others in order to improve the quality of education output. This is also true for quality education components in the context of early childhood education (PAUD). The findings of

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this study explain that input components such as the standard of Teachers and Education Personnel (PTK), Facilities and Infrastructure Standards, Management Standards, and Financing Standards do not contribute directly or indirectly to the output component (Standard of Achievement Level of Child Development). Input aspects have an influence on output when viewed together with the contribution of mediator variables or process components.

The research results prove that the standard of Teachers and Education Personnel (PTK) is a very determinant factor in determining the growth and development of children. The determinant coefficient of this factor is 83.7%. However, this factor's determination is not direct but through its correlation with factors in the process component. Therefore, efforts to improve the qualification, competence, and quality of early childhood educators need to be done simultaneously and comprehensively with various aspects that determine the quality of the PAUD process, such as improving the ability to develop and design contextual curricula, pedagogical skills and learning strategies, as well as improving the ability to assess children's development accurately and meaningfully.

5. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. Authors confirmed that the paper was free of plagiarism.

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