

A Study on the Relative Importance of Early Childhood Education Policy Assessment Scale Based on AHP Method

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Abstract: The findings of the study on the relative importance of the early childhood policy assessment scale are expected to boost the utilization and practicality of the scale, to give some suggestions on how to expedite the development of early childhood education policy and finally, to provide significant information on the academic development of this field. AHP method were conducted to check the certainty of the early childhood education policy assessment criteria. The 32 panel members who participated in the Delphi survey were asked to analyze weight by using AHP method. Then the simple weight of the assessment categories, assessment criteria and assessment indexes was converted into percentage. As for the assessment categories, early childhood education policy publicness was given the most weight (34.2%), followed by policy suitability (31.7%), policy democracy (23.1%) and policy economic efficiency (11.0%). Afterwards, the simple weight of the assessment criteria and assessment indexes was respectively calculated within the superordinate dimensions, namely the assessment categories to which each of them belonged. As a result of analyzing the total weight of the assessment criteria and assessment indexes, public benefit (0.150) was found to be top priority for the assessment criteria, followed by feasibility (0.118), accountability (0.102) and sufficiency (0.090). As for the assessment indexes, top priority was given to the level of donation to the interests of preschoolers (0.063), followed by the level of fulfilling social obligation (0.056) and the level of long-term benefit (0.053). In this study, the weights of the early childhood education assessment scale were estimated by a panel of experts who used the AHP. How much the responses of the experts were consistent was analyzed before their estimation of the weights and then the simple weights and total weights of the assessment categories, criteria and indicators were calculated.

Key words: Early, childhood, education, policy, assessment scale, AHP method, relative importance

INTRODUCTION

In order to accelerate the alteration of early childhood education, the betterment of educational situations including policy setting, facilities and finance is demanded and a lot of exertions should be made to improve curriculums and the dependability of early childhood education at the same time. As the weight of early childhood education is increasingly recognized, not only the early childhood education community but the government and politicians have suggested a variety of educational policies and alternatives. In fact, however, the government takes a look at the weight of early childhood education from the perspectives of social welfare and demography rather than from the perspective of education (Song, 2011).

Meanwhile, there have been dynamic shifts in policies related to early childhood education such as extended free education, more assistance for private kindergartens, better teacher treatment, improved

kindergarten environments and increasing all-day classes. Nonetheless, not many efforts have ever tried to examine national policies that are applied to the field of early childhood education (Kim, 2012). Whether there is anything wrong with early childhood education policies isn't yet properly considered and policy assessment isn't on the right track, either, though policy assessment is also important.

The theoretical foundation built by existing studies, practical methodology acknowledged by experienced educators and researchers and universal social values should all be reflected when an early childhood education policy is formulated and when the scope of it is determined. Also, the government, research institutions, scholars, the National Assembly, political parties, mass communication and people including parents should all be directly or indirectly involved in policy setting process by giving their opinions.

The purpose of this study (Kim, 2014) was to examine Kim's early childhood education policy

assessment scale by applying the Analytic Hierarchy Process method (AHP method) in an effort to decide the relative weight of the scale. The analytic hierarchy process could be said as a decision-making method of problem-solving type that properly combines subjective judgments and system approaches for the purpose of problem analysis. That makes it possible to analyze and evaluate a problem in a hierarchical way when the problem isn't clear enough and to judge qualitative characteristics by quantitative standards (Hong and Jang, 2009). That is, this method enables researchers to quantify and estimate the priority for the problem by converting a rating scale into a ratio scale (Cho *et al.*, 2003). Furthermore, that makes it possible to make a more coherent and objective judgment by reflecting the knowledge, experience and intuition of a panel of experts (Hong and Jang, 2009). This method has widely been applied in studies that need decision making thanks to its characteristics involving theoretical simplicity and clarity, ease of use and the generality of subjects (Vargas, 1990).

The findings of the study on the relative importance of the early childhood policy assessment scale are expected to boost the utilization and practicality of the scale, to give some suggestions on how to expedite the growth of early childhood education policy and finally to supply significant information on the academic growth of this field. A research question was posed: What is the relative importance of the early childhood education assessment scale?

MATERIALS AND METHODS

AHP method were conducted to check the validity of the early childhood education policy assessment criteria. The 32 panel members who participated in the Delphi survey were asked to analyze weight by using AHP method (Saaty, 1980, 1987). Stratified analysis using the AHP method proceeds to the process presented in Fig. 1.

To apply AHP, stage 1 needs to ‘form problematic hierarchy’ which makes a decision-making hierarchy mechanism map of the analytical subjects by mutually-related decision-making standard.

Stage 2 is to ‘form pair-wise comparison matrix.’ AHP makes one-to-one relative assessment by having its upper hierarchy as the assessment standard with being made a pair between two items in order to calculate the weight of factors which are at the same level.

Stage 3 is to ‘verify consistency’. In order for the relative importance to have a reliable significance, the

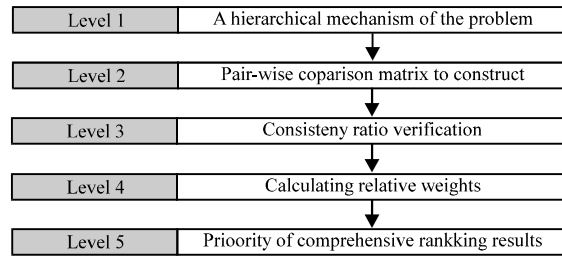


Fig. 1: Perform the procedure of AHP method

judgement of pair-wise comparison within one hierarchy needs to have consistency (Cho *et al.*, 2003). To confirm significant level of a rater’s judging the weight, AHP calculates CI (Consistency Index), CR (Consistency Ratio) and RI (Random Index) as follows (Kim and Kim, 2000):

$$CI = (\lambda_{max} - n) / (n - 1)$$

n: Number of elements which become the comparative objects within one hierarchy:

$$CR = (CI / RI) \times 100$$

Stage 4 is to ‘calculate relative weight.’ To measure relative weight of decision-making elements, Saaty (1980)’s Eigenvalue method is mainly used. Priority related to matrix is shown by using eigenvector. Given designating the relative weight of n-piece factor within hierarchy as w_i ($i = 1, \dots, n$), the factor of the pair-wise comparison matrix may be estimated to be $a_{ij} = w_i / w_j$ ($i, j = 1, \dots, n$). The following weight is calculated according to eigenvalue method by expressing this as matrix:

$$A \cdot W = \lambda_{max} \cdot W$$

- A = Square matrix that was obtained as a result of the pair-wise comparison
- λ_{max} = A’s maximum eigenvalue
- W = Eigenvector of responding to λ_{max}

The last stage is to ‘synthesize the outcome of priority.’ The order of a decision-making alternative is calculated by synthesizing relative weight in order to determine priority on each hierarchy after finishing the verification of consistency and the calculation of relative weight.

RESULTS AND DISCUSSION

The Delphi questionnaire for the estimation of the weights of the assessment criteria for early childhood

education policy consisted of three hierarchies: four assessment categories, 13 assessment criteria and 44 assessment indicators. Table 1 shows the importance and priority of the assessment categories of the first hierarchy based on their weights estimated by the panel.

As Table 1 shows then the simple weight of the assessment categories, assessment criteria and assessment indexes was converted into percentage. As for the assessment categories, early childhood education policy publicness was given the most weight (34.2%), followed by policy suitability (31.7%), policy democracy

(23.1%) and policy economic efficiency (11.0%). Afterwards, the simple weight of the assessment criteria and assessment indexes was respectively calculated within the superordinate dimensions, namely the assessment categories to which each of them belonged. The total weights, importance and priority of the assessment criteria and indicators of the assessment scale are shown in Table 2.

As Table 2 shows, result of analyzing the total weight of the assessment criteria and assessment indexes, public benefit (0.150) was found to be top priority for the assessment criteria, followed by feasibility (0.118), accountability (0.102) and sufficiency (0.090). As for the assessment indexes, top priority was given to the level of donation to the interests of preschoolers (0.063), followed by the level of fulfilling social obligation (0.056) and the level of long-term benefit (0.053).

Table 1: The simple weights of the assessment categories

The assessment categories	Weight	PCT (%)	Priority
Policy publicness	0.34	34.2	1
Policy democracy	0.23	23.1	3
Policy adequacy	0.32	31.7	2
Policy economy	0.11	11.0	4
Total weight	1.00	100.0	

Table 2: The total weights and importance of the assessment criteria and assessment indicators

Assessment criteria	Total weight of the criteria	Assessment indicators	Simple weights of the indicators	Total weights of the indicators	Priority
Policy publicness	0.150	How much the policy contributes to the public interests	0.227	0.034	7
		How much it contributes to the interests of preschoolers	0.419	0.063	1
		How much it provides benefits on the long-term basis	0.353	0.053	3
Policy sufficiency	0.090	How much it satisfies the needs of the members in terms of process	0.364	0.033	8
		How much it satisfies the needs of the members in terms of results	0.268	0.024	16
Policy accountability		How much it ensures the good performance of early childhood education	0.368	0.033	8
		How much it fulfills the social accountability	0.550	0.056	2
		How much it satisfies the conflicting needs of interest groups	0.182	0.019	23
Policy acceptability	0.075	How much it reduces problems that might occur during policy implementation such as cost problems or inconveniences	0.268	0.027	14
		How much it follows the principles that have been laid down based on quality educational experiences	0.377	0.028	11
		How much it accepts what's suggested by those who assume the obligations	0.172	0.013	32
Policy autonomy	0.067	How much it accepts what's suggested by the policy beneficiaries	0.196	0.015	27
		How many members are received as policy evaluators	0.255	0.019	23
		How much it ensures the autonomy of the members when they give their opinions	0.313	0.021	21
Policy diversity	0.089	How much it allows the members to control the policy implementation or implement it on their own	0.325	0.022	19
		How much it is independent from the government or external authority	0.363	0.024	16
		How much it satisfies the members who are all different	0.321	0.028	11
Policy feasibility	0.118	How much it reflects sociocultural diversity	0.316	0.028	11
		How much it reflects the various aspects of early childhood education	0.363	0.032	10
		education including inclusive education and multicultural			
Policy timeliness	0.081	How much it can be entrenched under the current educational circumstances	0.359	0.042	5
		How much it can be materialized in cooperation with educational institutions	0.429	0.051	4
		How much it can be materialized based on early childhood education theories	0.212	0.025	15
Policy responsiveness	0.062	How much the environments are appropriate to implement it	0.247	0.020	22
		Whether it is the right time for it to be implemented	0.288	0.023	18
		How much it is consistent with its objectives?	0.465	0.038	6
Policy responsiveness	0.062	How it responds to social needs	0.357	0.022	19
		How it copes with class discrimination	0.201	0.012	35
		How the government copes with it in terms of administration and finance	0.240	0.015	27

Table 2: Continue

Assessment criteria	Total weight of the criteria	Assessment indicators	Simple weights of the indicators	Total weights of the indicators	Priority
Policy locality	0.055	How it handles what happens during its implementation	0.202	0.012	35
		How much it reflects regional specificity	0.238	0.013	32
		How much it is flexibly executed in consideration of the environmental changes of local education	0.296	0.016	25
		How much it reflects efforts to improve local educational environments	0.201	0.011	37
Policy rationality	0.046	How much it reflects local needs	0.266	0.015	27
		How much it complies with the basic principles of early childhood education in terms of planning and setting	0.332	0.015	27
		How much it complies with the basic principles of early childhood education in terms of implementation	0.352	0.016	25
		How much it complies with the government's way of budget execution	0.316	0.014	31
Policy effectiveness	0.039	How much the results of it are consistent with its objectives	0.229	0.009	38
		How much it increases the opportunities of early childhood education	0.225	0.009	38
		How much it contributes to the enhancement of the quality of early childhood education	0.329	0.013	32
		How much it contributes to the professional development of early childhood teachers	0.218	0.008	40
Policy efficiency	0.025	How much it is useful in comparison with its execution cost	0.204	0.005	43
		How much practical benefits the results of it provides to early childhood education	0.328	0.008	40
		How much it is useful in comparison with various possible side effects	0.175	0.004	44
		How much positive influence the results of it exert on overall policies	0.294	0.007	42
Total	1.000		1.000		

CONCLUSION

In this study, the importances of the early childhood education assessment scale were estimated by a panel of experts who used the AHP. How much the responses of the experts were consistent was analyzed before their estimation of the importances and then the simple weights and total weights of the assessment categories, criteria and indicators were calculated. As for simple weight, “policy publicness” that was one of the assessment categories was highest in that regard. As to total weight, “public interest” was the assessment criteria whose total weight was highest and “how much the policy contributes to the interests of preschoolers” was the assessment indicator whose total weight was highest. Thus, these assessment category, criteria and indicator were given priority.

The findings of the study illustrated that in terms of early childhood education policy assessment, the kinds of assessment criteria and indicators that belong to the categories of publicness, adequacy and democracy are of importance. Specifically, the finding that the importance of the principle of democracy was stressed is noteworthy in that it is differentiated from the findings of earlier studies 10-11. It could be interpreted that these areas should carefully be considered when an early childhood education policy is formulated.

So, far, a research study was implemented on experts in early childhood policy and assessment, experts in early

childhood administration and professional early childhood educators by applying the AHP. This study has a limitation in that it was conducted just in some regions and the findings might not be generalizable. Yet as this study was conducted on the experts, it might not matter that its geographic scope was limited (Lee, 2006).

LIMITATIONS

Finally, this study has the following limitations: first, the geographic scope of this study was confined to some regions by examining the early childhood teachers who worked in the city of Busan and South Gyeongsang Province. To manufacture more generalizable results, more sampling is required from ample regions but it's not possible in this study to do that. Since then, sampling from more widen areas is required (Kim and Kim, 2015; Kim *et al.*, 2016; Kang, 2004). Second, a survey was conducted in this study which is a quantitative research method but it's not quite possible to look into the awareness and opinions of the early childhood teachers about the research theme in depth.

RECOMMENDATIONS

In the future, a qualitative research should be implemented by having an in-depth interview to produce more detailed, precise results.

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