



HIERARCHY ANALYSIS ON HAKKANENESE EDUCATION IMPLEMENTATION IN ELEMENTARY SCHOOLS

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Abstract

It has been years for teaching Hakka dialect in elementary schools. There are some improvements needed to be done in schools, families and communities. It will be a great benefit for teaching Hakka dialect if some efficient solutions are provided. This study used the SWOT analysis to analyze the literatures and categorized six directions for interviewing professionals. After the interview, the results were combined as a pretest ques-

tionnaire by using Delphi method. The questionnaire was generated as a formal Analytic Hierarchy Process (AHP) questionnaire by using Likert scales to identify the factors. The participants were Hakka dialect instructors, administrative staff, government officials, and parents. This study is intended to provide objective evaluation criteria for instructor. This study can also provide proper advice for administrations, communities, and families. It can further promote Hakka dialect teaching in elementary school.

Keywords: Hakka Dialect, Hakka Education, Analytic Hierarchy Process

Introduction

Hakkanese is the major symbol of Hakka people, as well as the foundation of Hakka culture. It is important to preserve Hakkanese. In addition, the inheritance of Hakkanese should take a root in Hakka population, to unite Hakka people and sustainably develop Hakka culture.

Tsao and Huang (2003) indicated that, in terms of native language ability of three major populations in Taiwan, the native language ability of Hoklo people is the best, followed by indigenous peoples and Hakka people. Failure to use native language has become a common phenomenon in younger Hakka generation, and Hakka people and Hakkanese have also gradually declined.

Considering the importance of Hakka culture and the fact that it is not easy to inherit it, the government has strongly promoted native language education. Therefore, Ministry of Education stipulated that, grade 1-6 students in elementary schools should choose one of the three native languages, Southern Fujian language, Hakkanese, and indigenous peoples' language, as a course since 2001 academic year. There should be one class of native language every week

in order to forcibly use the power of education to help native language education to take a root in younger generation. Therefore, this study intends to understand which measures should be taken in which environments to achieve the best effectiveness of promotion of Hakkanese education.

Research Background

History of Hakkanese Education and Related Teaching Studies

To revive the use of Hakkanese, it is necessary to understand the development process of language policies in Taiwan first, and find out the difficulties in promotion of Hakkanese, in order to propose problem-solving strategies.

Evolution of Language Policies in Taiwan

Lee (2004) indicated that the evolution of language policies in Taiwan is divided into 5 periods totally; 1) period of Netherland and Spain (1624--1662); 2) Ming Cheng and Qing period (1662--1895); 3) Japanese colonial period (1895--1945); 4) abolishment of Martial Law period (1945--1987): during this period, the government's language policies included 3 major tasks: firstly, to

exterminate Japanese, secondly, to use Chinese alone, and thirdly, to forbid the use of native language; 5) post-abolishment of Martial Law period (1987—present): after the abolishment of Martial Law, the society and political environment in Taiwan experienced dramatic changes. The situation where only Chinese was used was overthrown. Intellectuals supported “localization movement” to improve the status of local languages in Taiwan. In 2000, Ministry of Education announced Grade 1-9 Curriculum Guidelines to stipulate that, grade 1-6 elementary school students have to choose one of the three native languages, Southern Fujian language, Hakkanese, and indigenous peoples’ language, as a course since 2001 academic year.

Meaning of Native Language Teaching and Teaching Studies

United Nations Educational, Scientific and Cultural Organization (UNESCO) defined native language as “A language that a person learn during childhood and becomes the most natural tool of his/her thinking and communication.” The common language used by Hakka people across generations is “Hakkanese.” However, due to the changes in language, the accents of Hakkanese in use may be different. According to the investigation performed by Hakka Affairs Council, Sixian is currently the most popular Hakkanese in Taiwan, and the population using this accent outnumbers that using other accents. This study divided the related studies into 4 major parts according to their content and issues as follows:

(1) Teaching studies of mass media: Ho (2002) mentioned that, the power of media (including television and broadcasting) can be used to learn Hakkanese in life. Cheng (2004) indicated that the use of the features of internet environment to establish “local teaching website” can help enhance students’ learning motivation and improve their learning effectiveness. Weng (2007) suggested that, in the era of vigorous development of information technology, e-learning has become a new trend of learning.

(2) Teaching studies of manpower: Li (2001) suggested that, students will not actively engage in the learning of local language until parents uphold an attitude of encouragement and assistance to support and approve them, as well as to help them develop an attitude of listening more, speaking more, and learning more. Fan (2003) mentioned that, government authorities and school education personnel should assume the responsibilities of propaganda and communication with parents.

(3) Teaching studies of teaching resources, techniques, and contexts: Tseng (2004) mentioned that, the content, quantity, text length, difficulty, makeup, and layout have to be integrated with Hakka culture, and there should be explicit teaching objectives and appropriate teaching materials. Lo (1994) suggested that teaching methods, such as vivid speeches, visits, appreciation, and performances, should be used. Chao, Liao and Pan (2006) indicated that local language classroom should be set up, and the teaching context of Hakkanese should be decorated. Schools should set up “Hakkanese Day” and encourage

families to use Hakkanese in parent-child communication.

(4) Teaching studies of legal system and management: Hsu (2007) mentioned the experience of recovery of Maori language in New Zealand, and suggested that the establishment of “Hakka kindergartens” and “Hakka elementary schools” should be sponsored to extend the lifeline of Hakkanese. Chou (2005) indicated that, parents and local people in school districts should be invited to participate in the development and implementation of plans, and vivid and creative approaches should be used to create the interactions between school districts and campus.

Importance of Hakkanese Education

Wu (2002) cited the argument of Calvet, a French language scholar, “The life and death of a language is subject to its users.” When an individual gives up learning native language or gives up teaching native language to his/her children, this native language is dying. Every language should include a kind of culture. When a language disappears, the abundant cultural meanings also disappear accordingly. In modern times when the world resembles a global village, possession of a common language and native language is the intellectual property of an individual superior to that of others. A common language can be used to communicate with most of the people, while native language can also be preserved and will not disappear. Therefore, schools should attach importance to native language education.

The “Survey on Demographic Data of Hakka People in Taiwan from 2010 to 2011” by Hakka Affairs Council (2011) showed that, native language ability gradually decreases with the decrease in age, and the phenomenon of loss of native language is severe. The use of Hakkanese decreases significantly, and families should assume the responsibility. Chang (2001) pointed out that, because there are too many Chinese-speaking TV programs, children usually live in the Chinese environment and thus miss the gold stage of native language learning. Therefore, in addition to media and families, schools are another important learning channel for the absorption and learning of Hakkanese.

Situation of Current Implementation of Hakkanese Education

There are a total of 18 townships in Miaoli County, Hoklo people are mainly distributed in Zhunan Township, Houlong Township, Tongxiao Township, and Yuanli Township. Atayal tribe was mainly distributed in Taian Township. Saisiat tribe was mainly distributed in Nanzhuang Township. 90% of the population in the rest of the townships is Hakka population. The current promotion of Hakkanese education in Miaoli County is as follows:

(1) To stipulate the opening of classes in policies: including monolingual, bilingual and trilingual teaching.

(2) To implement “Native Language Day”: each school chose a day per week to implement it.

(3) To apply for the establishment of Hakkanese life schools: the application has been filed to Hakka Affairs Council, and funds have been provided.

(4) To strengthen Hakkanese certification examination: those who pass the examination will be provided with prizes. In addition, traffic allowance and teaching material fee are also provided.

(5) To enrich the sources of facilities: there are current Hakkanese teachers and Hakkanese support teachers.

Research Design

Delphi Method

Delphi Method (Delphi Technique) was developed by Rand Corporation in the early 1950s, and is common used when faced with complicated policy issues. Delphi method is a process of group communication. Linstone and Turoff (1975) indicated that Delphi is featured by the use of a comprehensive approach to estimate future phenomenon. During this process, every participant is allowed to fully expression their opinions and is equally valued, in order to reach a consensus to solve complicated issues.

The advantage of Delphi prediction is that complicated statistical methods are not required. Therefore, this method can be used in either academic fields or industries. This study used the following two methods to design expert interview and expert questionnaire:

(1) Open-end questions are used in the first round questionnaire survey to en-

able experts to freely describe their opinions on the research theme, namely, various opinions are canvasses. After the first round questionnaire survey, this study used content analysis to categorize the experts' opinions and develop the second round questionnaire survey.

(2) Likert scale was developed by R. Likert, and is also known as Likert comprehensive scale. Its design is to label the level of agreement on a 5-point scale to measure a series of attitudes. Importance or appropriateness of an item is divided into 0-5 levels, and 0-5 points are scored, respectively. A higher score indicates that an item is more important or appropriate. Measures of central tendency analysis are used to calculate the mean of various criteria, in order to understand the central tendency. The criteria with a mean ≥ 4 are retained, while those with a mean < 4 were deleted, in order to understand experts' evaluation of importance of various items.

Analytic Hierarchy Process

Analytic Hierarchy process (AHP) was developed by Professor T. L. Saaty (1980) at University of Pittsburgh in the U.S., and is generally applied to uncertain situations and decision-making issues with many evaluation criteria. It can be used to more a more accurate decision for complicated issues. Because the principles are simple and practical, AHP is frequently applied to selection of method of education or teaching materials.

AHP is to invite experts and scholars to evaluate various factors of decision-

making in a complicated issue first, and then to use simple hierarchical structure for presentation. Afterwards, a scale is used to quantify the factors that cannot be calculated, such as sense of uncertainty and preference. Pairwise comparisons of various factors are performed, and a matrix is developed to obtain eigenvector. The order of various factors is compared, and the consistency of pairwise comparison matrix is tested and make sure that the values can be provided as reference.

Establishment of Selection Criteria

The selection criteria of this study were established according to the following procedures:

SWOT Analysis on Hakkanese Education

SWOT analysis can be regarded as a situation analysis aiming to comprehensively confirm and evaluate the strengths (S), weaknesses (W), opportunities (O) formed by factors of external environment, and threats (T) of the current status of internal organization.

Delphi Questionnaire on Selection Criteria Factors

After interviewing 5 experts and scholars, this study found that some of the indices did not reach consistency. Therefore, this study summarized the opinions of all of the experts, and used items to design Delphi expert questionnaire. The same 5 experts and scholars were invited to complete their opinions in the second round questionnaire survey. The evaluation criteria specified in the

questionnaire included a total of 4 main criteria and 23 sub-criteria.

After the Delphi expert questionnaires were returned and the data of scores of various criteria were analyzed, the items with a mean < 4 were deleted. 4 main criteria and 17 sub-criteria were retained. The pairwise comparison expert questionnaire was designed using these 4 main criteria and 17 sub-criteria.

Development of Hierarchical Structure

This study used AHP to select the educational measures for promotion of Hakkanese in elementary schools. The structure was divided into 3 hierarchies, as shown in Table 1.

AHP Questionnaire Survey

This study systemically classified the hierarchies of the complicated issue. After the hierarchical structure was developed, this study used AHP to quantify various measurement items, and used MX Excel application software for calculation to obtain the weights of various items.

Questionnaire Design

According to the operating principles of Satty's AHP, when there are n factors, it is necessary to perform $n(n-1)/2$ times of pairwise comparisons [17]. This study included 4 main criteria and 17 sub-criteria, and performed a total of 34 times of comparison. Under the same evaluation criteria, pairwise comparisons were used for completing the questionnaire, and the relevant importance of two selection criteria were calculated. During

Table 1. Evaluation Criteria for Educational Measures for Promotion of Hakkanese in Elementary Schools

Hierarchy 1	Hierarchy 2	Hierarchy 3
Goal	Main criteria	Sub-criteria
Selection criteria factors for Best Educational measures for promotion of Hakkanese Education in Elementary Schools	A. Promotion and assistance of mass media	A1. Browsing Hakkanese learning websites
		A2. Watching Hakka TV programs
		A3. Reading books and magazines
		A4. Broadcasting of public audio and video services
	B. Effective manpower operation	B1. Facilities with great teaching ability
		B2. Support of school administrative personnel
		B3. Encouragement of family members
		B4. Propaganda of community volunteers
		B5. Induction of students' positive qualities
	C. Full preparation of resources and techniques	C1. Abundant teaching materials
		C2. Effective teaching methods
		C3. Appropriate assistance of teaching aids
		C4. Appropriate decoration of teaching context
	D. Completeness of system and management	D1. Explicit and practical policies
		D2. Generous government incentives
		D3. Sufficient funds
D4. Full implementation of schools		

Table 2 Pairwise Comparison Questionnaire

		A: B															
Evaluation item A	Absolutely important		Extremely important		Quite important		Slightly important		Equally important		Slightly important		Quite important		Extremely important	Absolutely important	Evaluation item B
		9:1	8:1	7:1	6:1	5:1	4:1	3:1	2:1	1:1	1:2	1:3	1:4	1:5	1:6	1:7	1:8
Promotion and assistance of mass media																	Effective manpower operation

the completion of the questionnaire, there were two 1-9 evaluation scales on the right side and left side, respectively (Table 2). A higher value indicates that a selection criterion is more important.

Development of Pairwise Comparison Matrix

Geometric mean was calculated from the data obtained from the questionnaire, and the comprehensive scores provided by experts were summarized. The pairwise comparison matrix A was developed using the values provided by the experts. Diagonal value of the matrix was the comparison between factor and itself. Therefore, the post-comparison value was 1. The diagonal divided the matrix into upper right part and lower left part. The values in the upper right

corner were the data of pairwise comparison of decisions, while the values in the lower left corner were the reciprocals of those in the upper right corner. In other words, $a_{ij} = 1/a_{ji}$. The pairwise comparison matrix A is shown as Equation (1).

$$\begin{aligned}
 A &= [a_{ij}] \\
 &= \begin{bmatrix} 1 & a_{12} & \dots & a_{1n} \\ a_{21} & 1 & \dots & a_{2n} \\ \dots & \dots & \dots & \dots \\ a_{n1} & a_{n2} & \dots & 1 \end{bmatrix} \\
 &= \begin{bmatrix} 1 & a_{12} & \dots & a_{1n} \\ 1/a_{12} & 1 & \dots & a_{2n} \\ \dots & \dots & \dots & \dots \\ 1/a_{1n} & 1/a_{2n} & \dots & 1 \end{bmatrix} \\
 &= \begin{bmatrix} w_1 & w_1 & \dots & w_1 \\ w_1 & w_2 & \dots & w_n \\ w_2 & w_2 & \dots & w_2 \\ w_1 & w_2 & \dots & w_n \\ \dots & \dots & \dots & \dots \\ w_n & w_n & \dots & w_n \\ w_1 & w_2 & \dots & w_n \end{bmatrix} \quad (1)
 \end{aligned}$$

Calculation of Eigenvalues and Eigenvectors

This study used the standardized formula of row vector average to calculate the vector value using Equation (2). “Promotion and assistance of mass media” is set as w_1 , “Effective manpower operation” is set as w_2 , “full preparation of resources and techniques” is set as w_3 , and “completeness of system and management” is set as w_4 .

$$w_i = \frac{1}{n} \sum_{j=1}^n \frac{a_{ij}}{\sum_{i=1}^n a_{ij}} \quad (2)$$

Consistency Test

Saaty suggested the use of consistence index (C.I.) and consistence ratio (C.R.) to jointly test the consistency of the pairwise comparison matrix.

According to the formula, before calculating C.I. value, it is necessary to obtain the consistency vector v and arithmetic mean λ first. v is calculated through Equation (3), and Equation (4) is also used to calculate the arithmetic mean, namely, λ .

$$v_i = \sum_{j=1}^n w_j a_{ij} / w_i \quad (3)$$

$$\lambda = \sum_{i=1}^n v_i / n \quad (4)$$

λ is used in the formula of consistency index, and the C.I. value can be obtained by Equation (5). If C.I.=0, there is consistency between former judgment and latter judgment. If C.I. > 0, there is no consistency between former judgment and latter judgment. Saaty suggested that C.I. < 0.1 is the allowable error.

Equation (6) describes the ratio of C.I. to R.I. that is called consistency ration (C.R.). When C.R.<0.1, the consistency level of the matrix is satisfactory.

$$C.I. = \frac{\lambda_{\max} - n}{n - 1} \quad (5)$$

$$C.R. = \frac{C.I.}{R.I.} \quad (6)$$

Information Analysis

Analysis on Subjects' Characteristics

This study invited the current teachers and support teachers of Hakkanese teaching in Hakka village school districts in mountain line of Miaoli County to complete the questionnaires. The questionnaire survey was conducted from March 1, 2014 to March 20, 2014. A total of 25 questionnaires were distributed, and 25 of them were returned, with a return rate of 100%. There was no inconsistent sample, and a total of 25 valid expert questionnaire samples were obtained. The data showed that, 48% of the subjects engaged in the teaching of Hakkanese for more than 10 years, and 40% of them engaged in it for more than 5 years, suggesting that the subjects' teaching experiences of Hakkanese were abundant.

Questionnaire Analysis

This study used AHP to perform analyses, and the hierarchical structure was divided into 3 parts.

Analysis on Importance of Main Criteria

The first-line Hakkanese teachers attached the highest importance to the index of effective manpower operation, with a weight of 0.3419. After all, human beings are the subjects of learning. Students cannot make any progress until they are willing to learn. Education cannot be promoted until teachers are willing to cooperate. The subjects attached the lowest importance to completeness of system and management, with a weight of 0.1433.

Analysis on the Importance of Sub-criteria

In the item of promotion and assistance of mass media, the influence of "browsing Hakkanese learning websites" was most significant, which reached 0.3994, suggesting that once online learning trend is developed, learning can be far-reaching. In the item of effective manpower operation, the influence of "faculties with great teaching ability" was most significant. Teachers' teaching ability affected students' learning performance.

In the item of full preparation of resources and techniques, the influence of "effective teaching methods" was most significant, which reached 0.3829. Teaching methods should be vivid and direct, and provide instant feedback. In the item of completeness of system and management, the influence of "explicit and practical policies" was most significant, which reached 0.3349 and was the turning point of development of Hakka culture.

Comprehensive Analysis

After the comprehensive analysis was performed, the ranking of weights was obtained. Table 3 could further understand the relevant importance of various factors, and enabled Hakkanese teachers in elementary schools to effectively choose most appropriate methods during the promotion of Hakkanese educational measures without being prejudiced by personal subjective factors.

Table 3 Comprehensive Analysis on Importance of Various Factors

Criteria	Weight of Criteria	Sub-criteria	Weight of Sub-criteria	Weight Multiplied	Order
Promotion and assistance of mass media	0.3070	Browsing Hakkanese learning websites	0.3994	0.1226	1
		Watching Hakka TV programs	0.2863	0.0879	3
		Reading books and magazines	0.1823	0.0560	8
		Broadcasting of public audio and video services	0.1320	0.0405	11
Effective manpower operation	0.3419	Facilities with great teaching ability	0.3142	0.1074	2
		Support of school administrative personnel	0.2292	0.0784	6
		Encouragement of family members	0.2359	0.0806	4
		Propaganda of community volunteers	0.1216	0.0416	10
		Induction of students' positive qualities	0.0991	0.0339	14
Full preparation of resources and techniques	0.2078	Abundant teaching materials	0.3014	0.0626	7
		Effective teaching methods	0.3829	0.0796	5
		Appropriate assistance of teaching aids	0.1742	0.0362	13
		Appropriate decoration of teaching context	0.1415	0.0294	15
Completeness of system and management	0.1433	Explicit and practical policies	0.3349	0.0480	9
		Generous government incentives	0.2815	0.0403	12
		Sufficient funds	0.1902	0.0273	17
		Full implementation of schools	0.1934	0.0277	16

Conclusion

Children's native language ability cannot be improved until they happily learn and repeatedly practice native language in the environment of native language. Good and accurate Hakkanese educational measures can assist in and achieve this objective. Specific and practical methods can be developed according to the order of the 17 sub-criteria. To strengthen the implementation of Native Language Day, information should be integrated in teaching in schools. In terms of policies, the teaching hours should be extended, and Hakkanese should even be included into compulsory courses, instead of elective courses. Families should arrange relevant parent-child joint learning activities of Hakkanese, and provided positive feedback as reward. In communities, volunteers are requested to promote Hakkanese on campus, and actively talk to children in Hakkanese, in order to create a win-win-win situation.

There are some limitations in this study, further studies on issues concerning promotion of Hakkanese educational measures in elementary schools are advised to refer to the following:

- (1) Future studies can probe into single theme or specify more detailed criteria to provide more effective selection.
- (2) Future studies are advised to further subdivide regional scope.
- (3) Future studies are advised to further perform in-depth analysis on the measures for promotion of Southern Fu-

jian language or language of various tribes of indigenous peoples.

- (4) If the similarities and differences in perspectives between teachers and students, and their influence on learning effectiveness can be further compared, the research may be more abundant and complete.

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