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Investigating Attitudes towards a Bilingual Education Curriculum: A Scale Development Study

Burhan OZFIDAN[1], Lynn M. BURLBAW[2], Sezai KOCABAS[3]

Abstract

Millions of people across the world live in societies where their mother tongue is not the dominant language. The purpose of this study is to develop a scale to measure bilingual education perspective and also identify the obstacles, opportunities, challenges, and benefits of bilingual education for minority students who are suffering from language learning. This study examined how certain parameters such as the attitudes and views towards bilingual education may influence on a bilingual education curriculum development. This study is significant because we developed specific scale, Scale Development of a Bilingual Education Perspective (SDBEP), to measure the attitudes and views towards bilingual education. The sample size of the study is composed of 560 participants included culturally and linguistically different background of population. During the development of the scale, two different samples were utilized. Explanatory factor analysis (EFA) was used for the first half (N=280) and confirmatory factor analysis (CFA) was used for the second half (N=280). The results of the study indicated that SDBEP could be considered a valid and reliable tool to measure people's perspective toward a bilingual education program. We developed a valid and reliable scale to help researchers who are trying to measure perspective of a bilingual education program in all over the world.

Keywords: bilingual education, culture, language, opportunities, benefits, SDBEP.

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Introduction

Language is undoubtedly one of the most serious issues among minority people since their lack of language fluency limits them to involve a society (Rossell, & Baker, 1996; Ozfidan, 2017). Hence, this study discussed how minority languages could be placed within a new curriculum at schools, and the need for a language curriculum to build a base that supports the developmental process of bilingual education. This purpose of this study is to develop a scale to measure bilingual education perspective and also identify the obstacles, opportunities, challenges, and benefits of bilingual education. This study examined how certain parameters such as the attitudes and views towards bilingual education may influence on a bilingual education curriculum development. This study is significant because we developed specific scale, Scale Development of a Bilingual Education Perspective (SDBEP), to measure the attitudes and views towards bilingual education.

The following research questions are addressed: (1) 1. What are the exploratory factor analysis (EFA) results of Scale Development of a Bilingual Education Perspective (SDBEP)? (2) What are the confirmatory factor analysis (CFA) results of the SDBEP?

Literature Review

Millions of people across the world live in societies where their mother tongue is not the dominant language. Some people are refugees from civil and political turmoil (e.g., Somalis in Seattle, Syrians in various European Union countries, or people from Central America) or indigenous or descendants of emigrants (Québécois and First Peoples in Canada, Basques in Spain, Tibetans in India, or Cubans in the United States) (Ozfidan, & Burlbaw, 2017). These types of people face multiple challenges ranging from basic living needs to communicating with the larger society to obtain jobs and education (Bialystok, 1991; Cooke, 2009). An additional concern is the maintenance of culture, both in and through social activities and language (Cummins, 2008; Skutnabb-Kangas, 2000).

Bilingual education covers teaching academic content in two languages, normally mother tongue and second language (minority language) in accordance with the program model (Cummins, 2001; Ozfidan, 2017). According to James Cummins (2000) who is an expert in the field of bilingual education, “bilingual education provides language skills that aid in employment, increase the educational success of students, encourage peace among different ethnic groups, support equality in educational settings, help to solve social conflicts among ethnic groups, and benefit students who have different ethnical background in the community” (p.54). A bilingual education program with an education system has also an important role building a strong relationship between two different ethnic groups (Baker, 2000; Genessee, & Gandara, 1999; Ozfidan, & Burlbaw, 2017).

There are many benefits of bilingual education. For instance, according to Ngai (2002), a bilingual education program "preserve cultural identity, ethnic identity, and the linguistic knowledge of minority group and help to socialize people for full participation in their communities" (p.243). Research indicates that bilingual students can usually understand the content of their lessons more effectively and successful in their schooling (Bialystok, Peets, & Moreno, 2014). Students will be able to express their thoughts, ideas, and feelings more comfortably in their classes once they will be educated in their mother tongue (Cummins, 1991; Morse, 1994). According to Ricento (2013), this gives students self-confidence to be successful in their courses.

Bilingual education has many benefits. According to Baker (2011), "a bilingual education can consolidate the brain's executive function and change the shape and function of the brain's certain regions" (p.325). Bilingual people, particularly children, are good at dealing with conflict management. According to Hakuta (1990), children who are speaking more than one language are usually cognitively more developed than others. Research also indicates that speaking a second language gives a more global perspective for both children and adults. In a study in 1991, Ellen Bialystok, who is an expert in the field of bilingual education, affirmed that "bilingual education conserves minority people's cultural heritage, linguistic knowledge, religious, and ethnic identity, and increases particularly minority children's educational success, promotes peace between different ethnic groups, and provides equality in education" (p.143). This indicates that how a bilingual education program is important for minority people.

Methodology

Research Design

The purpose of the study is to develop a reliable and valid scale to increase research relevant to bilingual education perspective. The study used a descriptive survey method within this framework. We used explanatory factor analysis (EFA) and confirmatory factor analysis (CFA) in the study, but with different sampling.

Sample

The sample size of the study is composed of 560 participants included culturally and linguistically different background of population. During the development of the scale, two different samples were utilized. The sample is divided into two parts randomly. Explanatory factor analysis (EFA) was used for the first half (N=280) and confirmatory factor analysis (CFA) was used for the second half (N=280).

Table 1 (explanatory factor analysis) indicated that 69.06 % of the participants are female and 30.94 % are male. In the explanatory factor analysis part of the study, 108 of the participants were K-12 teachers, and 172 of them were K-6 teachers. The nationality of the participants consisted of the USA (112), Turkey (87), Spain (36), Canada (35), Germany (6), and France (4).

Table 1. Demographics for Survey for explanatory factor analysis (N=280)

	n	% of total
Gender of the respondent		
Female	192	69.06
Male	88	30.94
Occupation		
K-12 Teachers	108	38.57
K-6 Teachers	172	61.43
Nationality		
The USA	112	40.00
Turkey	87	31.07
Spain	36	12.86
Canada	35	12.50
Germany	6	2.14
France	4	1.43

Table 2 (confirmative factor analysis) indicated that 62.14 % of the participants are female and 37.86 % male. In the confirmatory factor analysis part of the study, 135 of the participants were K-12 teachers, and 145 of them were K-6 teachers. The nationality of the participants consisted of the USA (135), Turkey (74), Spain (30), Canada (15), Germany (10), and France (6).

Table 2. Demographics for Survey for confirmatory factor analysis (N=280)

	n	% of total
Gender of the respondent		
Female	174	62.14
Male	106	37.86
Occupation		
K-12 Teachers	135	48.21
K-6 Teachers	145	51.79

Nationality		
The USA	135	48.21
Turkey	74	26.43
Spain	30	10.71
Canada	15	5.36
Germany	10	3.57
France	6	2.14

Data Analyses

For first sample, EFA was used to examine the factor structure of the SDBEP using SPSS. Having observed the factor structure and revised the SDBEP, new data were collected from the second sample and the initial factor structure was cross-validated by performing CFA through using Mplus.

Reliability and Validity

Cronbach's alpha was utilized to analyze the reliability of "Scale Development of a Bilingual Education Perspective" (SDBEP). *Table 3* below shows that the Cronbach's alpha internal consistency measure was quite high across all 49 items ($\alpha = .97$). For Cronbach's alpha, a minimum value of .70 is considered acceptable (Nunnally, 1978). Thus, the SDBEP scale was reliable.

Table 3. Reliability of the study

Cronbach's alpha	N of Items
.972	49

Similarly, for content/face validity of the study, faculty members who are experts in the field of ESL and Linguistics in the United States reviewed the survey questions. The validity results of the study showed a statistically significant correlation. The correlation ($rs = .532$, $p = .000$) is considered to be a moderate/ medium correlation (.40 -.60) (See Laerd Statistics, n.d.). Hence, the SDBEP was found to have content validity.

Findings

The researchers used the Kaiser-Meyer-Olkin (KMO) test to specify sampling suitability, which is "an assumption that must be met in determining the appropriateness of using factor analysis, and values can range between 0 and 1" (Ozfidan, & Burlbaw, 2017, p.342). According to Anderson and Gerbing (1984),

"the KMO test can be used to determine the overall sampling adequacy of the sample or to measure each individual variable" (p.87).

There are numerous guidelines existing for Kaiser's interpretation results. According to Ballesteros's (2003) guideline, "value of 0 shows the sum of partial correlations is large relative to the sum of correlations, which indicate diffusion in the correlations pattern; therefore, factor analysis is probably inappropriate" (p. 143). He also emphasized "if the value is close to 1, patterns of correlations are quite compact and factor analysis indicates different and reliable factors" (p. 143). Kaiser (1974) created more precise guidelines for interpretation. He asserted that if the values were higher than 0.5 they were acceptable. Furthermore, he said that "values between 0.5 and 0.7 should be considered mediocre, values between 0.7 and 0.8 should be considered good, values between 0.8 and 0.9 should be considered great, and values of more than 0.9 should be considered superb" (Jolliffe, 2002, p. 135-136). *Table 4* below shows that the Kaiser's interpretation value was 0.92 for this study, which falls into the range of superb. Therefore, the data are appropriate for factor analysis.

Table 4: KMO and Bartlett's Test

KMO Measure of Sampling Adequacy		.917
	df	7054.645
	Sig.	.000

Exploratory Factor Analysis (EFA)

The researchers used oblique rotation. *Table 5* below indicates that five factors were extracted from the study: "beliefs about bilingual education", "bilingual education benefits", "academic value of bilingual education", "efficient of using mother tongue", and "bilingual education curriculum development." Each of these factors represented different perspective of bilingual education.

Table 6 below shows cronbach's alpha coefficients scores for each factor. For cronbach's alpha, a minimum value of .70 is considered acceptable (Nunnally, 1978). This table indicates that each factor has quite high cronbach's alpha scores, which show each factor is reliable for factor-based scales.

Table 7 shows that factors are not highly correlated each other and this shows that each factor is representing different perspective. If factors are highly correlated each other, each factor will not measure different perspective of bilingual education.
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Table 5. Pattern Matrix

Q	1	2	3	4	5
1	.765				
2	.741				
3	.628				
4	.591				
5	.641				
6	.614				
7	.649				
8	.525				
9	.554		.514		
10	.578				
11	.521				
12	.519				
13	.570				
14		.580			
15		.587			
18		.526			
19		.623			
20		.460			.464
21		.344			
22		.564			
23		.567			
24		.652			
25		.548			
26		.593			
27			.634		
28			.568		
29			.566		
30			.565		
31			.569		
32			.517		
33			.623		
34			.550		
35			.577		
36			.526		
37				.640	
38				.614	
39				.563	
40				.666	
41				.667	
42				.578	
43				.596	
44					.567
45					.669
46					.762
47					.691
48					.645
49					.673

Table 6. Cronbach's Alpha Coefficients for factor-based scales

Factors	Cronbach's alpha	N of Items
beliefs about bilingual education	.94	13
bilingual education benefits	.94	13
academic value of bilingual education	.93	10
efficient of using mother tongue	.89	7
bilingual education curriculum development	.91	6

Table 7. Inter-Factor Correlation Matrix

Component	1	2	3	4	5
1	1.000				
2	.512	1.000			
3	.422	.420	1.000		
4	.464	.407	.440	1.000	
5	.326	.332	.395	.376	1.000

Confirmatory Factor Analysis (CFA)

Table 8 indicates fix index statistics and recommended value of these statistics and resources, which support these statistical data analysis.

Table 8. Goodness-of-fit indices of the five-factor model

Fix Index	Recommended Value	Resource(s)	Overall model
χ2 Test of Model Fit	Low χ2 value and p > .05 If p < .05	Brown, & Moore (2012); Tabachnick & Fidell (2007); Byrne (2004); Hu & Bentler (1990)	611.143
χ2/df	Good Fit χ2/df < 1 Acceptable Fit χ2/df < 2	Byrne (2004)	1.858
CFI	.90 ≤ CFI ≤ .95 (adequate fit)	Brown, & Moore (2012)	.92
SRMR	SRMR≤.08 (reasonably good fit)	Hu & Bentler (1999)	.071
RMSEA	RMSEA < .05 (good fit) RMSEA < .08 (fair fit)	Brown, & Moore (2012); Hu & Bentler (1999); Jöreskog & Sörbom (1993); Tabachnick & Fidell (2007)	.038
TLI	>.95	Brown, & Moore (2012); Bentler (1990)	.98

Note: χ2 = chi-square, RMSEA = root mean square error of approximation, SRMR = the standardized root mean square residual, CFI = comparative fit index, and TLI= Tucker-Lewis Index

Table 8 shows that the ratio of chi-square with degree of freedom is 611.143/442 = 1.86. This value emphasizes that there is excellent fit between "the suggested matrix and the original variable matrix" (Tabachnick & Fidel, 2001). RMSEA value shows good fit for the measurement model, which was calculated as .038 for this study. According to Jöreskog and Sörbom (1993), RMSEA value is good fit if it is <.05 and fair fit if it is <.08 (see also Tabachnick & Fidell, 2007; and Hu & Bentler, 1999). SRMR value is an absolute measure of fit and defines "the standardized difference between the observed correlation and the predicted correlation."(Hu & Bentler, 1990, p. 322). SRMR value of the study is .071. If SRMR value is <.08, it will be considered a good fit. CFI value measures "the model fit by examining the discrepancy between the data and the hypothesized model, while adjusting for the issues of sample size inherent in the chi-squared test

of model fit, and the normed fit index" (Brown, & Moore, 2012, p.231). CFI value of this study is .92. According to Brown and Moore (2012), if CFI value is between .90 and .95, it will be considered good fit. It is clear that values received from the study are in acceptable interval when they were compared with expected critical values. According to the result of the study, each factor presents the statements.

Discussion

In the results of EFA, we found that five factors were extracted from the study: "beliefs about bilingual education", "bilingual education benefits", "academic value of bilingual education", "efficient of using mother tongue", and "bilingual education curriculum development." Each loaded factor represented different perspective of bilingual education. The first highly loaded factor referred how people believe a development of bilingual education program and how this program will be effective for their students. Within this factor, we found that 91% of the participants believed that a bilingual education program will bring an affirmative influence on minority groups' future career and will increase intergroup understanding. The second highly loaded factor referred benefits of using this bilingual program in schooling and how this program will be useful for minority students. This factor indicated how minority students who are taught by means of a bilingual education program could preserve their cultural heritage, ethnic and religious identity, and linguistic knowledge; besides, this factor also mentioned about other benefits of bilingual education such as school attendance at the primary school level, and understanding of language and cultural variety. The third highly loaded factor referred value of a bilingual education for minority students and how this program will help to minority students to be academically more successful. There are many minority students whose language is not enough to continue their education and this program will help these types of minority students to be successful in their schools. The fourth highly loaded factor referred about using mother tongue and how this will help students to be successful in schooling. This factor indicates importance of using mother tongue. Mother language was an inseparable element of people's culture and everyone has the right to learn his or her mother tongue. The last and fifth highly loaded factor referred about curriculum related issues within a bilingual education program. This factor discusses appropriate curricula for different type of bilingual education program.

We used CFA to test the model's fit and to decide whether or not the factor structure of the relevant section in the original form could be confirmed. According to Cole (1987), "CFA is performed to verify the confirmation of a pre-determined structure" (p.79). In the CFA results, we found that all the items are statistically significant at .05 level meaning that all items (observed variables) are representing their latent variable. CFA conducted to measure the extent to which the 49 items in the original scale and the five-factor structure decided and the data gathered

with this study fit together. We found that the items respectively 8, 9, 10, 13, 25, 27, and 35 displayed unsatisfactory loading tendencies towards other implicit variables; besides, those implicit variables already predicted in theory. According to Thompson (2004), "the error variances of the items reflect score unreliability if the model is specified correctly" (p.143). Thus, we removed these items from the study to develop conceptual clarity. The rest of the items (42) were perfectly fitted.

Conclusion

This purpose of this study is to develop a reliable and valid scale to measure bilingual education perspective and also identify the obstacles, opportunities, challenges, and benefits of bilingual education. Explanatory factor analysis (EFA) was used for the first half (N=280) and confirmatory factor analysis (CFA) was used for the second half of the study (N=280). The purpose of using EFA in this study is to uncover the underlying structure of a relatively large set of variables and identify the underlying relationships between measured variables. The purpose of using CFA is to test how well the measured variables represent the number of constructs. CFA and EFA are similar techniques. We basically explored data and provided information about the numbers of factors required to represent the data in EFA. All measured variables in EFA were related to every latent variable. In CFA part of the study, we specified the number of factors required in the data and which measured variable was related to which latent variable. We used CFA to confirm the measurement theory.

To conclude, Scale Development of a Bilingual Education Perspective (SDBEP) can be considered a valid and reliable tool to measure people's perspective toward a bilingual education program. We developed a valid and reliable scale to help researchers who are trying to measure perspective of a bilingual education program in all over the world.

Limitations of the study

The limitations of this study may comprise but are not limited to the quality and nature of data analysis and data collection methods as well as the socio-political problems linked to the backgrounds of participants. The followings were some of the limitations of the study:

– Sample size: Because the study used factor analysis, a large sample size was required for the data analysis to find significant relationships from the data. Achieving the necessary size took an extended period and reaching many minority groups in different countries proved demanding.

– Diversity in sampling: The researchers could not reach out to many different ethnic groups in different countries. Participants were speaking their native language other than English. Most participants in survey data collection

were male. The researchers could not reach many female participants because male academics outnumbered female's academics in the countries we collected our data.

– Language issues: We had difficult time to find participants who were able to read and understand in English for our survey questionnaire since all questions in the survey instrument prepared in English.

– Location: Because most data were collected from different countries other then the USA, achieving a large of sample size was difficult. Many telephone calls were made to reach colleagues to help us to find potential participants.

– Survey questionnaire: The survey, lengthy in nature due to the need to collect data on numerous research questions, may have reduced the willingness respondents to participate, potentially reducing the sample size. Many emails were sent to individuals. Some individuals responded that they didn't fill out the survey instrument because it was a bit long. This barrier proved time consuming because it took a while to find enough individuals who were willing and able to participate.

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