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Abstract

The purpose of this study is to develop and validate the Early Childhood Care and Education Curriculum Instrument designed to identify teachers' perceptions towards the quality of early childhood curriculum in Malaysia. Through extensive review of the literature and interviews with experts and experienced teachers, items contributing to the quality of early childhood education were identified. In order to enhance the validity of this instrument, two experts had reviewed the instrument. In addition, 619 pre-school teachers were involved in this study. Factor analysis revealed four scales regarding the quality of early childhood curriculum. The four scales were (1) curriculum content; (2) curriculum review; (3) Philosophy and Core Principles; (4) Support for Special Needs. Each item in the instrument had a factor loading range between 0.96 and 0.35, while the alpha reliability coefficient for each scale ranges between 0.96 and 0.68. The findings of this study confirm the validity and reliability of the Early Childhood Care and Education Curriculum Instrument.

Keywords: Early Childhood Care and Education Curriculum, Instrument, Pre-school.

Introduction

The Malaysian government has taken various strategies through the implementation of policies, increased funding as well as enhanced capacity building programs towards a strong foundation for the development and expansion of ECCE. The government has further ensured that ECCE is available to all through initiatives under the National Key Result Area (NKRA), Public Private Partnership, increase access to ECCE under the NKEA, through rapid scale-up of private child care centers and preschools as well as ECCE training centers. The establishment of child care centers also raises female workforce participation that has increased the national economy. It is also an investment for Malaysia's overall social economic development. Malaysia has made remarkable success in recognizing the need for and implementing programs to establish its commitment to

ECCE. Subsequent policy and funding directions and economic analyses also add to the wealth of evidence that investing in the early years makes a significant difference to the development of a nation. However, investment in the early years has been accompanied by the introduction of a more academic curriculum, reducing children's opportunities for play, and resulting in less time being allowed for the development of children's imagination and creativity.

Quality programs have been predicted to produce desirable outcomes. However, the challenge is to identify the predictors that can quantify the definition of a quality program. As evident from previous studies, a search for predictors of a standard universal quality program is fraught with difficulties. Quality varies with context and culture of a particular society. Therefore, what constitutes a quality program in one country may not be similar to another. One of the aspects that contribute to the quality of a program is the curriculum. Curriculum has significant impact as its cover the content of learning, theories and all relevant activities. A quality curriculum can be assess using various instruments. There were several established instruments developed to assess the quality of program as well as curriculum in the pre-school, but those instruments were not suitable to be used in Malaysia contexts. Hence, this study aimed to develop and validated a standard instrument to assess the quality of Early Childhood Care and Education Curriculum in Malaysia

Research Objectives

The objectives of this study are to:

1. Develop Early Childhood Care and Education Curriculum Instrument (ECCECI) for teacher.
2. Determine the validity and reliability of the ECCECI.

Methods

The aim of this study is to construct and validate the Early Childhood Care and Education Curriculum Instrument (ECCECI). The study employs the quantitative method and uses a cross-sectional survey design. The quantitative method is used because the researcher seeks to establish the overall tendency of responses from individuals and to note how this tendency varies among people. All the data are collected using a set of questionnaires at one point in time. A total of 619 pre-school teachers from various states in Malaysia have participated in this study. The teachers involved are required to answer all the items in ECCECI. The ECCECI consists of 60 total items and is allocated in four scales; (1) Curriculum Content; (2) Curriculum Review; (3) Philosophy and Core Principles; (4) Support for Special Needs. Each item has a four-point Likert scale with responses 1 for strongly disagree, 2 for disagree, 3 for agree and 4 for strongly agree.

Development of the Early Childhood Care and Education Curriculum Instrument (ECCECI).

The development of ECCECI adopted a three-stage approach. Stage 1 includes the identification of salient scales, Stage 2 involves writing individual items within the scales and Stage 3 involves field testing items followed by item analysis and validation procedures. These three steps were also used by Walker and Fraser 2005; Che Ahmad et al, 2014. 2015). The following is the description of the steps involved in each stage

Stage 1 – Identification and development of salient scales

Stage 1 consisted of four steps that led to the identification and development of salient scales. The first step was reviewing the literature related to pre-school curriculum in Malaysia and globally. This step aims to identify key components that researchers, experts and practitioners consider to be important and have a strong influence on determining the quality of curriculum used in the classroom. The second step involved reviewing established instruments related to quality of ECCE curriculum in Malaysia and other countries for scales that could be modified to construct the ECCECI. The third step was conducting face to face interviews and discussions with experts and experienced pre-school teachers to obtain their opinion. The fourth step was to develop a set of preliminary scales. The scales selected were Curriculum Content, Curriculum Review, Philosophy and Core Principles and Support for Special Needs.

Stage 2 – Writing individual items

Stage 2 involved two steps. Step one involved adapting items used in established instruments and developing new items for the new scales identified. Step two involved distributing the entire set of items to validation by panel of experts. These scales and example of items in the ECCECI are described in Table 1 .

Table 1: Childhood Care and Education Curriculum Instrument (ECCECI)

Scale	Item per scale	Sample Item
Curriculum Content	15	My TASKA/TADIKA's curriculum builds gross and fine motor skills among children
Curriculum Review	15	My TASKA/TADIKA's curriculum is regularly reviewed.
Philosophy and Core Principles	15	I understand the philosophy of the implemented curriculum in my TASKA/TADIKA.
Support for Special Needs.	15	My TASKA/TADIKA can handle special needs children

Stage 3 – Field testing and analyses

Stage 3 was conducted in two steps. Step one included administering the draft instrument with a large sample of the target population in order to ensure sufficient data for statistical analysis. Step two involved factor analysis that aimed to determine the construct validity and internal consistency reliability of ECCECI. Responses were collected from 619 pre-school teachers from various states in Malaysia. All teachers are pre-school teachers who are experienced in the teaching in Tadika and Taska.

Factor analysis is conducted to serve two purposes; firstly, to refine the ECCECI scales; and secondly, to provide evidence regarding the reliability and the validity of the refined scales. Data were analysed and Cronbach's Alpha (α) coefficient was used to measure internal consistency

reliability in terms of the inter-correlations among items. Specifically, this is a measure of the extent to which items within a scale measure the same construct as other items in the same scale. Those items that are not highly correlated with their respective scales are removed and data are reanalysed until all the items with the lowest item-scale correlations are removed and the alpha coefficient is maximized. The analyses of the refined data set provide evidence to support the overall reliability and factorial validity of the refined scales

Findings

The development of the Early Childhood Care and Education Curriculum Instrument utilizes the intuitive-rational strategy in which only items with high internal consistency remain in the final instrument. It also relies upon the internal strategy (Hase & Goldberg 1967), whereby only those items with high factor loadings on their own scales and low loadings on other scales are kept in the final instrument. This section describes the methods by which ECCECI is refined and its validity and reliability are determined

Validity

Construct validity is investigated, as described below, using principal component factor analysis with Oblimin rotation. The aim of factor analysis is to ascertain the fundamental structure of a comparatively large set of variables (Garson 2001). This method of analysis is consistent with the method used in developing instrument by Fraser (1986) and Dorman (2003) to determine if items load on a priori scale.

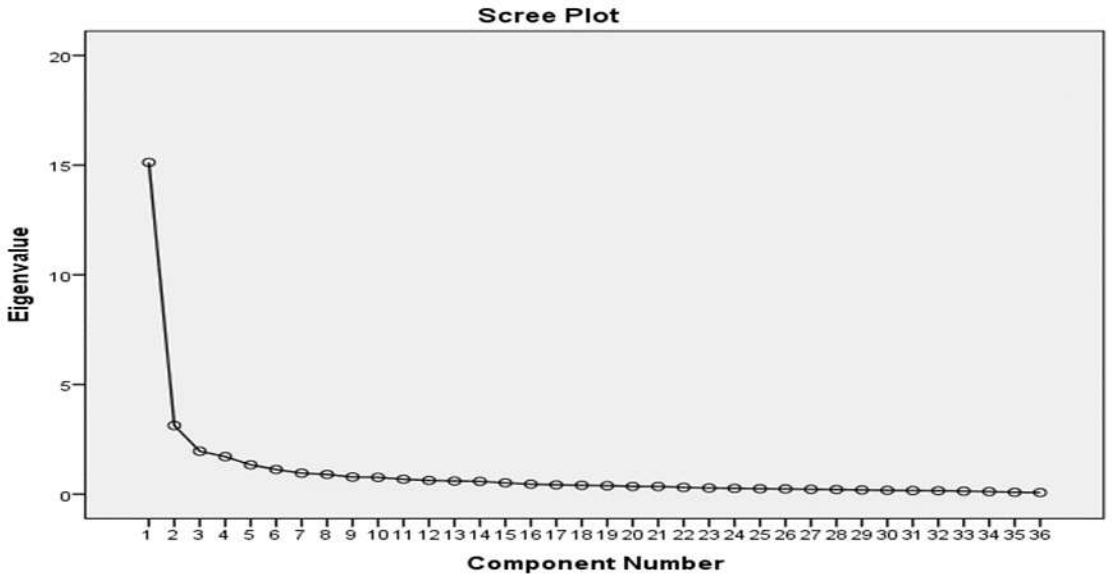
In addition, factor analysis provides information about whether items within a given scale are measuring that scale and no other scale. In instrument development, the value of factor loadings used varies. For example, factor loadings of between 0.30 and 0.35 of items on their a priori scale and no other scales are acceptable in some studies (Dorman & d'Arbon 2001; Johnson & Stevens 2001); while other studies argue that factor loadings below 0.50 are unacceptable (Walker 2003). In this study, only those items with a factor loading of at least 0.30 on their own scale are kept in the refined instrument.

Prior to factor analysis, Barlett Test of Sphercity, which provides information whether there is a relation between Kaiser-Meyer-Olkin (KMO) coefficient and variables, is applied to test whether the data are suitable for factor analysis. The sample should be of an adequate size, since the size of the sample affects the results of factor analysis. Related literature suggests that KMO should be greater than .60 for factor analysis be applied on the data (Pallant 2001). KMO value of the data of this study is calculated as .943, which falls within the intended range. Besides the result of Barlett Test is significant [Barlet Test =15516.563, df=630, (p<.000)]. The results of KMO and Barlett Test imply that adequate sample size has been provided for the study and factor analysis could be carried out on these data.

Factor identification is the process used to ascertain the number of factors to keep in a survey. There are a few tools available for researchers to help determine the appropriate number of factors to retain. One is the Kaiser criterion, which recommends that researchers select factors with Eigenvalues greater than 1.0. Second is the Scree Test. The Scree Test examines the Scree Plot, which is a plot of the Eigenvalues along an x-y axis. The point at which the curve decreases and straightens out (i.e. the “elbow” of the graph) is the point where researchers should include all factors before and at the elbow. The factor analysis for Early Childhood Care and Education

Curriculum Instrument began with 60 items. From the analysis, 41 items are accumulated under 4 factors that have Eigenvalue greater than 1. Scree Plot (Figure 1) also indicates 4 points before start to straight. Therefore, the scale can be accepted to have a maximum of 4factors**.**

Figure 1: Factor selection using a Scree Plot



These four factors explain 60.89 % of the total variance while 39.12% of the variance remains unaccounted. For social sciences, variance rates between 40% and 60% are accepted and adequate (Kutluca et al. 2010). Table 2 shows Eigenvalues and a percentage of variance accounted by each factor in the ECCECI. Four scales were originally developed for the ECCECI field test and, after factor analysis, the same four scales remained: Curriculum Content, Curriculum Review, Philosophy and Core Principles and Support for Special Needs As in Table 2, these 41 items cluster in four factors with Eigenvalues greater than 1. The first factor explains 42.01% of the total variance, while the second factor explains 8.70% of the total variance. In addition, the third factor explains 5.43% of the variance and the last factor explains 4.75% of the total variance. Overall, these four factors explain 60.89% of the total variance.

Table 2: Eigenvalues and percentage of variance accounted by each factor in the ECCECI

Factors	Eigenvalues	Percentage of Variance explained	Total Percentage of Variance
1	15.13	42.01	42.01
2	3.13	8.70	50.71
3	1.95	5.43	56.14
4	1.70	4.75	60.89

In the factor analysis, the items with load factor greater than 0.30 are retained; so four items (load factor less than 0.3) have been removed. Finally, the instrument ends up with 41 items.

Table 3 illustrates items of each factor and their factor loads.

	Factor loading			
	Curriculum Content	Curriculum review	Philosophy and core principles	Support for special needs education
13	.868			
11	.848			
15	.846			
9	.846			
16	.827			
8	.817			
12	.812			
10	.781			
14	.780			
18	.750			
17	.735			
20	.677			
19	.645			
23	.600			
7	.596			
6	.583			
5	.552			
21	.543			
22	.528			
24	.489			
25	.445			
36	.347			
29		.772		
30		.682		
26		.680		
31		.647		
27		.609		
32		.572		
33		.458		
28		.406		
2			.814	
3			.806	
1			.803	
4			.689	
34				.967
35				.962
51				.750
48				.678
55				.725
57				.689
58				.430

The first factor,

Curriculum Content scale has 22 items with load values of these items vary between 0.868 and 0.347. The second factor, Curriculum Review had 85 items with the load values vary between 0.772 and 0.406. The third factor, Philosophy and Core Principle had 4 items with the load values vary between 0.814 and 0.689 .The last factor, Support for special needs Education had 7 items the load values vary between 0.967 and 0.430.

Reliability

In the development of the ECCECI, each scale is assessed for internal consistency using Cronbach's Alpha coefficient. Table 4 presents the reliability for each refined ECCECI scale for the sample of 619 pre-school teachers. The internal consistency reliability (coefficient alpha) ranges between 0.961 and 0.648 for the four ECCECI scales. In detail, the Cronbach's Alpha is 0.961 for Curriculum content, 0.816 Curriculum Review, 0.941 Philosophy and Core principles, and 0.648 for Support for special needs education.

Table 4: Scale reliability using Cronbach's Alpha coefficient for ECCECI

Scales	Number of Items	Reliability Coefficient
Content of Curriculum	22	0.961
Curriculum Review	8	0.816
Philosophy and Core principles	4	0.941
Support for special needs education.	7	0.648

N=619

Using a generally applied 'rule-of-thumb' this range is considered acceptable to good (George & Mallery 2001), since the closer the alpha is to 1, the greater the internal consistency of the items. Table 5 presents the final instruments which consist of four constructs and 41 items.

Table 5: Early Childhood Care and Education Curriculum Instrument (ECCECI)

Item no.	Items
	Content of Curriculum
1.	My TASKA/TADIKA's curriculum develops socio-emotional skills among children.
2.	My TASKA/TADIKA's curriculum develops gross and fine motor skills among children..
3.	My TASKA/TADIKA's curriculum promotes the development of children's thinking skills*.
4.	My TASKA/TADIKA's curriculum develops understanding of early mathematics in children .
5.	My TASKA/TADIKA's curriculum promotes the development of children's reasoning skills*.
6.	My TASKA/TADIKA's curriculum focuses on early literacy and language among children.
7.	My TASKA/TADIKA's curriculum inculcates noble values in children.
8.	My TASKA/TADIKA's curriculum develops understanding of early science among children.

9. My TASKA/TADIKA's curriculum instils religious/spiritual beliefs among children.
10. Pembelajaran melalui bermain adalah penting dalam kurikulum TASKA/TADIKA saya.
    Learning through play is important in my TASKA/TADIKA's curriculum
11. My TASKA/TADIKA's curriculum promotes the development of children's problem solving skills
12. My TASKA/TADIKA's curriculum follows the Developmentally Appropriate Practices (DAP)*.
13. My TASKA/TADIKA's curriculum emphasizes holistic development through the integrated approach.
14. I am satisfied with my TASKA/TADIKA's curriculum
15. My TASKA/TADIKA's curriculum emphasizes communication skills in children.
16. My TASKA/TADIKA's curriculum nurtures children's aesthetics* values
17. My TASKA/TADIKA's curriculum encourages children to express their creativity* through learning activities.
18. My TASKA/TADIKA's curriculum follows the Culturally Appropriate Practices* and local values
19. My TASKA/TADIKA's curriculum follows the Technologically Appropriate Practices*.
20 My TASKA/TADIKA's curriculum promotes the use of natural/local resources and handmade products.
21. My TASKA/TADIKA's curriculum promotes the use of recycled resources.
22. My TASKA/TADIKA's curriculum emphasises on religion/spiritual based activities.

Curriculum Review

23. My TASKA/TADIKA's curriculum is internally monitored

24. My TASKA/TADIKA's curriculum has no problem with internal monitoring
25. My TASKA/TADIKA's curriculum is regularly reviewed
26 My TASKA/TADIKA's curriculum is also monitored by external agencies
27 My TASKA/TADIKA's curriculum needs on-going revision and evaluation
28 The development of my TASKA/TADIKA's curriculum seeks views from different stakeholders (e.g.: parents, community, teachers/caregivers, early childhood expert).
29 Parents are given the opportunities to be involved in the process of my TASKA/TADIKA's curriculum review (e.g.: parents, community, teachers/caregivers, early childhood expert).
30. My TASKA/TADIKA's curriculum has rooms for improvement.

Philosophy and Core Principle

31	I understand the vision of the implemented curriculum in my TASKA/TADIKA.
32.	I understand the mission of the implemented curriculum in my TASKA/TADIKA.
33.	I understand the philosophy of the implemented curriculum in my TASKA/TADIKA.
34.	My TASKA/TADIKA supports the curriculum philosophy through the designed activities.
	Support for Special Needs
35.	My TASKA/TADIKA accepts children with special needs.
36.	My TASKA/TADIKA can handle children with special needs
37.	My TASKA/TADIKA conducts screening to identify children with special needs
38.	My TASKA/TADIKA provide learning resources for children with special needs.
39	My TASKA/TADIKA prepares different learning experiences for children with special needs
40.	My TASKA/TADIKA takes action after identifying children with special needs.
41.	My TASKA/TADIKA needs a special teachers to assist children with special needs.

Discussion

This study aimed at developing a reliable and valid instrument to measure the Early Childhood Care and Education Curriculum. The draft scale had 60 items and administered to 619 pre-school teachers in various states in Malaysia. As a result of analysis, 19 items were excluded from the scale and 41 items were retained. These items were placed under Curriculum Content, Curriculum Review, Philosophy and Core Principles and Support for Special Needs.

Based on the analysis conducted, the instrument ECCECI was found to have a high reliability and also a good construct validity which could be used in the study concerning the quality of curriculum for pre-school. This instrument also had its own uniqueness as it contains the aspects of curriculum that might contribute to quality teaching in pre-schools. These aspects are chosen based on established instruments, result of previous studies and are also based on interviews with expert and experienced pre-school teachers.

The ECCECI also had the advantage of being easily administered and answered by the respondents; it consists of four scales with a total of 41 items. This number is appropriate and did not burden the respondents. In addition, it is user-friendly; the grammar and words used in ECCECI were simple and easy to understand. It was also very economical to use in terms of time and cost efficiency. According to Lewthwaite et al. (2007), because of the time constraints imposed on teachers, it is essential to ensure that the instrument requires only a relatively short time to complete and process.

ECCECI is an addition to existing instruments specially for measuring the quality of curriculum in pre-school. The ECCECI also could be adapted and used for various kinds of respondents and for different environments depending on the needs and creativity of researchers. However, care needs to be considered because it was designed for the pre-school teachers.

Conclusion

This paper has reported the development and validation of an instrument designed to assess the quality of Early Childhood Care and Education Curriculum. The development of ECCECI is an addition to existing instruments to evaluate pre-school curriculum. The findings of this study confirmed the validity and reliability of the Early Childhood Care and Education Curriculum Instrument. However, an extensive research is needed to further refine this instrument by considering different characteristics of respondents to establish more valid and reliable measures of Early Childhood Care and Education Curriculum instrument.

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