

Cross-Cultural Adaptation of Developmental Criteria for Young Children: A Preliminary Psychometric Study

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Abstract

Authentic assessment approach applies naturalistic observation method to gather and analyse data about children's development that are socio-culturally appropriate to plan for individual teaching and learning needs. This article discusses the process of adapting an authentic developmental instrument for children of 3-6 years old. The instrument consists of 217 criteria of development for children between the ages of 36-72 months; grouped under six domains, which are fine motor, gross motor, adaptive, cognitive, socio-communication, and social. It is a criterion measurement tool, which was developed for the American context. This instrument needed to be adapted into the Malay socio-cultural context before it could be applied in local setting. The adaptation process involved directly translating the items; investigating the items/criteria's score format; examining the items by a panel of experts; observing the real setting to investigate the score patterns and calculating observer agreement index. 103 children from the Malay ethnic group aged between 36-72 months, six field experts, and twelve observers were involved as participants. The researcher and an editor translated all the criteria for development; novice observers carried out a pilot study to test the suitability of score format; six children's specialists examined the translated criteria; and lastly, the researcher observed activities in the preschool setting to score the criteria in naturalistic manner. The translated criteria, checklists; and developmental scores were analysed through visual and descriptive statistics. Content analyses showed that most of the developmental criteria were suitable to be applied in the research context. However, there are a few criteria considered as not appropriate and scores between observers indicated low agreement on how they interpreted the criteria.

Keywords: authentic assessment, criterion-referenced measurement, cross-cultural adaptation, naturalistic observation

1. Introduction

1.1 Problem Statement

This project is a part of a doctoral thesis investigating the implementation of authentic assessment in a university-based early childhood centre. It is funded partly by a government-funded grant to study the adaptation of authentic assessment for children 0-6 years. At the time of research, the centre where the study was carried out was undergoing a transformation after being handed over to the Education Faculty. One of the vital changes was to shift practice from academic orientation towards a more developmentally appropriate practice. Implementing authentic assessment at the centre was an initiative through action research; a collaborative work between researchers, field experts, teachers/caregivers, and administrators. In order to implement authentic assessment procedure, a localized instrument was searched for but to no avail. Authentic assessment instrument was not available in the local context and a highly reliable instrument needed to be adapted from other socio-cultural context before the authentic assessment procedure could be implemented in early childhood setting. The instrument chosen was an authentic, curriculum-based assessment (Bricker et al., 2002) that was originally developed for children in the United States of America. International Testing Committee (ITC, 2010) recommends that a comprehensive adaptation process must be applied before any tool is to be applied in a new socio-cultural context. This is vital because the results or interpretation from the tests could have adverse effects on the child if item/criterion is not appropriate for the child's natural development in a given living situations/conditions or traditions. From the developmental psychology field (Cole, 2005), it is agreed that culture plays important roles in child's development and universal developmental milestones may not apply to all

children. Therefore, an appropriate approach needed to be studied on how to adapt the criteria of development and to report the psychometric properties of the instrument.

1.2 Importance of Study

Authentic assessment is highly recommended by early childhood experts and researchers around the world. It is also recommended in the National Preschool Curriculum (Ministry of Education, Malaysia 2002, 2009, 2010a, 2010b) in Malaysia. Authentic assessment can be utilized to assess young children's developmental milestones and hence it can assist in the process of identifying developmental delay and/or disabilities. Early identification can be beneficial in reducing the risks of a child being learning disabled at later/school age (Bricker et al., 2002; Grisham-Brown & Pretti-Frontczak, 2011; Grisham-Brown et al., 2006). However, a comprehensive and validated instrument developed specifically for local context was not available to be applied in early childhood centre. This research was to study the appropriateness of applying authentic assessment tool from other socio-cultural context and thus, to explore some of the psychometric properties of the developmental criteria of the tool. The tool has been claimed by the authors as to have been validated and its psychometric studies shown high reliability indices (Bricker et al., 2002).

1.3 Literature Review

1.3.1 Authentic Assessment

Authentic assessment refers to assessment that is carried out in naturalistic settings. It also means that observation carried out by an observer who is familiar to the child, systematically, without any interference to the activities and routines of the child. This is done to ensure that data collected are diverse and 'true' in order for teachers to plan appropriate teaching-learning sessions (Bagnato et al., 2010; Neisworth & Bagnato, 2004; Nutbrown, 2006). Furthermore, authentic assessment procedure must be contextual and socio-culturally appropriate to ensure fairness (Morrison, 2006; 2011). Collaboration is an element of authentic assessment that is practiced during data collection of child development, diagnosis, planning for teaching or intervention, and whole program evaluation (Grisham-Brown & Pretti-Frontczak, 2011). This is important because child development and learning always involve family, teachers, experts and other community members (Bricker et al., 2002).

1.3.2 Developmental and Culture

Modernism in the 18th century had an impact on the education system that it turned the later into a uniform, and stable institution, accepted by majority, and content knowledge guarded closely by the authority in order to transfer knowledge from older generation to the younger ones (Dahlberg et al., 1999; Riley, 2007). However, with the emerging of post-modernism era, those practices were shaken because post-modernists rejected the idea of rigidity and that knowledge should be developed together, socially and equally by the members of the society. Cole (2005); Gonzalez-Mena (2005); Robinson and Diaz (2006); Papatheodorou and Moyles (2012), agreed that diversity in human life should be given a priority in building a curriculum, which is aligned with the UNCRC's statements (UNICEF 2001). Cole (2005) explains in his theory related to cultural element that there are three theoretical perspectives in considering the cultural influence on the child development. These are biology-maturity, environment-learning, interaction, and culture-context. Cole also suggests that culture is a behaviour that is followed or acquired from previous ancestors. However, the mechanism on how culture affects development in a particular group of people is a very complex issue especially, given the globalization of today's world.

1.3.3 Curriculum-Based Assessment

AEPS[®] is a curriculum-based assessment instrument that is categorized under criterion-referenced measurement. It links assessment, planning and teaching/intervention, and evaluation of program continuously. Literally, AEPS is the acronym for Assessment, Evaluation, and Programming System for Infants and Children (Bricker et al., 2002). There are six domains in AEPS[®]: 3-6, which are fine motor, gross motor, adaptive, cognitive, socio-communication, and social. Each domain consists of a few *strands* that divide into specific behaviour or skills. In each strand, there are a few *goals* and these then separate into a few *objectives*. Criteria for goals and objectives are explained in details along with a few examples of children's activities. For the purpose of observation, only the objective and goal are scored for between 0, 1, and 2 figures. There are 21 strands, 54 goals, and 163 objectives. The total number of goals and objectives is 217 and is shown in table 1; and the simplified explanation version of these is displayed in Appendix.

Table 1. List of items or criteria in the curriculum-based instrument

Domain	Strand(S)	Goal(G)	Objective(O)	Total(G+O)
Fine motor	2	5	10	15
Gross motor	2	6	11	17
Adaptive	3	7	28	35
Cognitive	8	17	37	54
Socio-communication	2	8	41	49
Social	4	11	36	47
Sub-total	21	54	163	217
Total (S+G+O) 238				

Research on AEPS[®]: 3-6 had begun in the 1980's and is still going on until this day (Bricker et al., 2002). In the year 1986, Slentz as discussed in Bricker et al. (2002), carried out an inter-rater agreement, concurrent validity, and relationship between domain score and overall score. Others like Hsia (Bricker et al., 2002) also investigated the inter-rater agreement, reliability index and sensitivity. Treatment validity was researched by Bricker & Pretti-Frontczak beginning year 1997. Pretti-Frontczak & Bricker (2000) found that goal and objective written assignment by teachers had improved after a training session of AEPS[®]:3-6. This had shed a light on the teachers' part because it could save a lot their time when they could plan, teach, and assess continuously. That is because assessment gives them direct link to the curriculum, which is the main feature of curriculum-based assessment. Furthermore, results from study also showed that this instrument could be utilized as an eligibility tool for young children who need to get under the intervention services program in the United States (Macy et al., 2007) and Bricker et al. (2002).

1.3.4 Criterion-Referenced Measurement

Experts agreed that inter-rater agreement is the most important analysis tool in order to establish the reliability for criterion-referenced measurement (CRM). Traditional techniques used to analysed reliability e.g. test-retest, alternate-form and split-half are not recommended (Cohen & Swerdik, 2002; Aiken & Groth-Mamat, 2006; Kaplan & Sacuzzo, 2001, Glaser, 1971; Popham & Husek, 1971; Popham, 1981, 2005) for use within the CRM reliability tests.

1.3.5 Cross-Cultural Adaptation Procedure

The general guidelines for cross-cultural adaptation process recommended by the International Test Commission outlined four main categories (ITC, 2010) and (Hambleton, 2005) which are i) context, ii) development and adaption of tests, iii) administration, and iv) documentation and interpretation of score. In short, translators need to stay unbiased; the evidence for the suitability of language, linguistic, culture, and statistical analyses must be recorded; equivalence between original and adapted tests must be established; administrators of tests must ensure the right setting; and all details about the changes in new adapted version must be documented.

1.4 Purpose and Questions

The purpose of this study was to investigate the appropriateness of applying an authentic assessment instrument, which was first developed for other culture into the Malay socio-cultural context. The study was divided into four phases and thus the questions are discussed separately into each phase as follows:

1.4.1 Phase 1–Research Questions

Is AEPS[®]:3-6 appropriate in terms of language and socio-culture in order to be applied in the setting?

- 1) Which criteria of developmental domain can be translated directly and remained unchanged?
- 2) Which criteria of developmental domain has to be changed, modified or replaced?
- 3) Which criteria of developmental domain has to be eliminated and/or redeveloped?

1.4.2 Phase 2–Research Questions

The question was based on the observation made by observers on the suitability of the score format and is as follows:

1) What is the criterion that could not be scored due to inability to interpret the scoring figure?

1.4.3 Phase 3–Research Questions

The following are the questions that the expert panel had to answer when they reviewed the criteria in the instrument.

- 1) Are the translated criteria difficult to understand or confusing?
- 2) Are the translated criteria familiar to the Malay socio-cultural context?
- 3) Are the translated criteria referring to the appropriate skills of Malay children between 3-6 years?
- 4) Are the translated criteria arranged in the hierarchical order of skills?
- 5) Are the translated criteria retained its meaning as similar to that of original instrument?

1.4.4 Phase 4–Research Questions

The main question in this phase is about the index of reliability and specifically is the index of inter-rater agreement.

- 1) What is the inter-rater agreement of observers?

1.5 Conceptual Framework

At the beginning of this research, no literature could be found on the topic about adapting criterion-referenced measurement or authentic assessment. Based on the knowledge about criterion-referenced measurement, cross-cultural adaptation recommended by International Testing Committee (ITC, 2010), and authentic assessment procedure itself, the author developed the framework for the study. Expert panel review and inter-rater agreement are the priorities in this procedure. Figure 1 shows the conceptual framework.

Furthermore, there was almost no literature to be found about the nature of the Malay children development. The researcher had discussed this issue with the panel of experts at the Medical Centre, Universiti Kebangsaan Malaysia, and the experts had no idea about an instrument or any study of that nature. During the discussions, the researchers developed the idea that child experts at hospitals and clinics in Malaysia have been trained to apply instruments which were first, developed in the developed nations and for use in that particular nations. Consequently, specialists, experts and medical personnel only know that kind of instrument and it never across their mind (and that they do not have the time and expertise) that those instruments should be adapted before they could be applied to the local context. In addition, they had never been introduced to an instrument that is highly reliable and valid and is specifically meant to reflect the Malay culture. Thus, finding literature to support the Malay views about development was not fruitful. In addition to explain the situation, it is well-known that textbooks on child development for use in the tertiary education level in Malaysia, majority are bought from developed nations of different cultures; and that phenomenon is addressed here in the study.

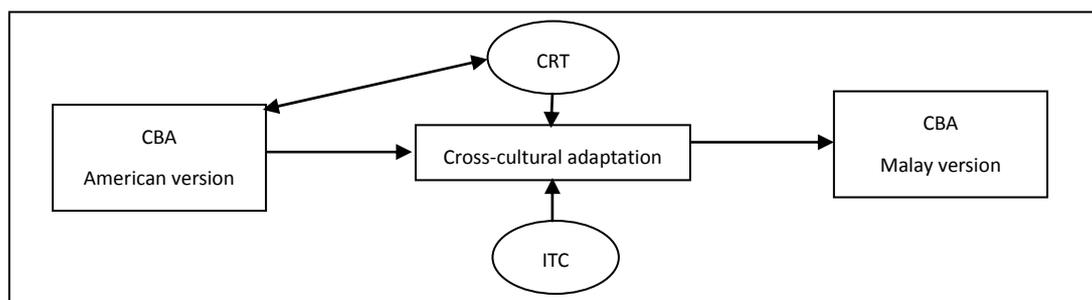


Figure 1. Conceptual framework

2. Method

There are four phases in this particular adaptation research which are i) translation, ii) suitability of score format, iii) expert review, and iv) observers' agreement. The adaptation processes were carried out in phases which are explained in the next paragraphs.

2.1 Phases of Research

2.1.1 Phase 1–Translation of Criteria

The translation was carried out by the author and the translated criteria were then edited by a Master holder degree of Malay Language. The criteria were first typed into the Word® document and then translation was done domain by domain. After the literary translation, the criteria were examined for its socio-cultural appropriateness through discussions with several colleague and observations made by the researcher at early year's settings.

2.1.2 Phase 2–Suitability of Scoring Format

Once the translation was done, three observers had the instrument studied for the suitability of score format. The students who were undergoing their undergraduate special education courses of the Education Faculty observed three children between 3-6 years and tried to score the instrument. Their scoring patterns should be able to indicate whether 0, 1, and 2 format was suitable for use by local observers.

2.1.3 Phase 3–Expert Review

Each expert reviewed the criteria in order to ensure the appropriateness of the criteria from the perspectives of child/developmental experts. They were each given a checklist of AEPS® [M]:3-6 which is a dual-language checklist of Yes/No. They identified any criterion that was not considered suitable for the local context.

2.1.4 Phase 4–Observation and Scoring

After the review from the expert panel, three observers set out to the field—an early childhood setting to observe the children's developmental criteria and to score the criteria in naturalistic environment.

2.2 Instrument

AEPS®: 3-6 that is a curriculum-based, and also known as a criterion-referenced measurement is the main instrument being utilized in this project.

2.3 Participants

There are a few types of participants involved in this study and categorized into translator, editor, observers, expert panel, and children. The translator is a bilingual who speaks and writes in both Malay and English languages. Meanwhile, the editor was a Master degree holder specialising in Malay Language and a graduate from a local university. Observers for the scoring format study were undergraduate students who had their training under the special needs education. Three children were involved during the scoring format study who were in a childcare centre and at home looked by either caregivers or parents. Expert panel were medical and child experts from a local university-based hospital who were invited to be participants. Most participants speak and write both Malay and English languages. Observers for naturalistic observation in the setting were selected from the Master holders of Social Sciences Faculty from a local university. Children who were involved in the last phase of this study mainly were the children of the university's staff. A total of 100 children were involved and they were observed in their natural daily activities and routines. Table 2 shows a list of participants and their participation type.

Table 2. List of participants

Phase	Participation	Total number	Type of participation
1	a. Translator	1	Translating the criteria (document text) from American socio-culture into Malay socio-culture
	b. Editor	1	Editing the translated Malay version of criteria
2	c. Observer for score format	3	Testing the suitability of score format through observation
3	d. Expert panel	6	Reviewing the edited Malay version of criteria
4	c. Observer for scoring	3	Observing children and assessing their developmental in naturalistic environment
	d. Children	103	Their activities were observed without interruptions or clinical/testing

2.3.1 Ethics

Parents/family was given a form to fill in their demographic background information and to indicate whether they allow the child to be involved in the study or otherwise. The researcher had also asked for permission to take photos and videos for observation and assessment/scoring purposes.

2.4 Data Collection Procedure

Naturalistic observation was the main idea behind authentic assessment procedure and thus, it was applied during almost the entire process. Data gathered from observations were either directly scored in the Observation Data Recording Form AEPS[®]:3-6 or being transferred into checklists.

2.5 Data Analysis Procedure

Data were analysed separately in each phase and various kinds of analyses were utilized during the processes as shown in table 3. Data (translated and edited text) collected in the first phase, second phase (score patterns), and third phase (checklists), and the last one (score 0, 1, 2) were analysed using descriptive statistic; with addition of an observer agreement index being calculated in the fourth phase.

Table 3. Type of data and analysis involved in the four phases

Phase	Type of data	Type of analysis
1	Translated text (criteria) Edited text (criteria)	Content analysis – descriptive statistic
2	Score (0, 1, 2)	
3	Checklists (Yes/No)	Reliability index – inter-rater agreement
4	Score (0, 1, 2)	

3. Results

Results are categorized into phases and are discussed in the next paragraphs.

3.1 Phase 1

There were a few criteria in the domains that could be categorized into two categories, which are either ethnic-bound or universal cultures. Ethnic-bound mostly found in AEPS: 3-6 are adaptive and cognitive; otherwise are universal culture. Adaptive domain criteria e.g. preparing table for meal, using eating utensils, and using paper tissue during toileting deemed to be a little different in the way they are practiced in the local context. The hot and humid weather also affects the way children put on and take off clothes. Language and linguistic had also found to be not suitable and some of the criteria need to be redeveloped. Universal culture was translated directly without many changes to the criteria, and ethnic-bound criteria were modified or changed into criteria that are more suitable. All Strand B in Socio-communication domain had its criteria eliminated and needs to be developed in future study. Table 4 shows the summarized categorized criteria.

Table 4. Phase 1–analyses summary

Domain	Ethnic-bound culture	Universal culture	Direct translation	Modification	Eliminate
Fine motor	-	All criteria	All criteria	-	-
Gross motor	-	All criteria	All criteria	-	-
Adaptive	SA G2 O2.2 SB G1 O1.1 SC G2 O2.3	Othercriteria	Other criteria	SA G2 O2.2 SB G1 O1.1 SC G2 O2.3	-

Cognitive	SH G1 O1.3	Othercriteria	Other criteria	SH G1 O1.3	-
	SH G1 O1.4			SH G1 O1.4	
	SHG2			SH G2	
	SH G2 O2.1			SH G2 O2.1	
	SH G2 O2.2			SH G2 O2.2	
	SH G2 O2.3			SH G2 O2.3	
Socio-communication	AllSB	All SA	All SA	-	AllSB
Social	-	All criteria	All criteria	-	-

Note: SA G2 O2.2 = Strand A, Goal 2, Objective 2.2.

3.2 Phase 2

Observers did not find it difficult to interpret the score format and they all could administer the instrument quite easily. Although we cannot assume that the scores were accurate, but we could still conclude that 0, 1, and 2 figures did not pose any trouble for the observers when scoring. Table 5 shows the summary of the scores.

Table 5. Phase 2—analyses summary

Total score for all domains								
observer	age (year)	Fine Motor	Gross Motor	Adaptive	Cognitive	Socio-Communication	Social	Total Score
1	3+	53.00	55.00	113.00	126.00	62.00	139.00	294.00
2	4+	46.00	55.00	102.00	146.00	58.00	132.00	224.00
3	5+	59.00	64.00	122.00	204.00	89.00	228.00	316.00

3.3 Phase 3

Findings from the analyses showed that expert panel mostly agreed that the criteria were appropriate for the local context with little modifications in the sentence structure. Other than that, they agreed that the criteria needed no major changes in the hierarchy or developmental aspect. The data were categorized according to the research questions and are displayed in Table 6.

Table 6. Phase 3—analyses summary. Data analysis for expert review

Domain	CODE A	CODE B	CODE C	CODE D	CODE E
Fine motor	SA G2	-	SA G1 O1.1	-	SB G2 O 2.3
			SCG1		SB G1
Gross motor	SB G1	-	-	-	SB G1 O1.1
	SBG3				SB G1 O1.3
	SB G3 O3.1				SB G2 O2.3
					SB G3
Adaptive	-	-	SA O1.3	-	-
			SB G1		

					SA G3 O3.1
					SA G3 O3.2
				SC G1	SC G1 O1.1
				SC G1 O1.1	SC G2 O2.1
	SB G1			SC G2	SC G3 O3.1
Cognitive	SC G2 O2.1	SH G1 O1.2	SH G1 O1.2	SC G2 O2.1	SE G1 O 1.2
	SE G2			SC G3	SE G2
	SH G2 O2.1			SC G3 O3.1	SE G2 O2.1
				SH G1 O1.2	SE G2 O2.2
				SH G3	SF G1 O1.3
					SH G1 O1.4
					SH G2 O2.1
Socio-communication	-	-	-	-	-
Social	SB G1 O 1.2	SA G1 O1.4	-	-	-
Total=43	9	2	5	8	19

3.4 Phase 4

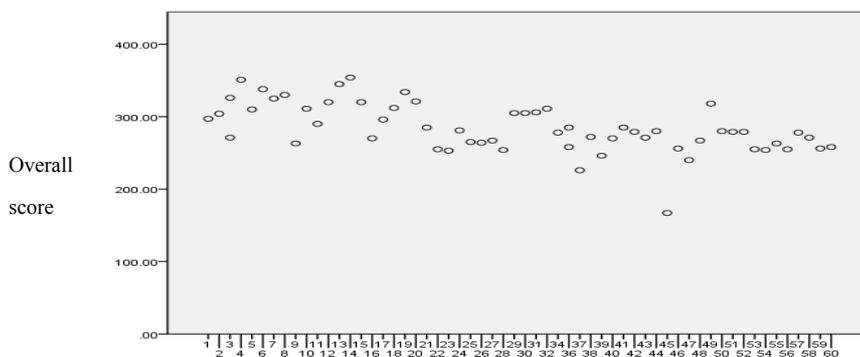
3.4.1 Score of All Domains

Overall score for the domains ranged from 5,000 to 6,300(see table 7). Score for 4 year olds were the highest among the three groups and it indicates that observers might not be well equipped with knowledge and training for observing children in naturalistic setting and thus, interpretations between them might vary greatly. In figure 2, we could see that the scores were almost visually the same for all groups. Inter-rater agreement would be able to tell whether the observers had the same level of interpretations or not when they were observing, the criteria in the instrument. This is discussed in the next sub-section.

Table 7. Phase 4—analyses summary (part 1)

Year	Score	Fine motor	Gross motor	Adaptive	Cognitive	Socio-communication	Social	Overall score
4	Total	541.00	591.00	1207.00	1704.00	641.00	1583.00	6267.00
5	Total	506.00	581.00	887.00	1486.00	635.00	1412.00	5507.00
6	Total	600.00	600.00	862.00	1744.00	740.00	1607.00	5291.00

Note: 1. Overall score = score of all criteria (goal and objective: 0,1,2)



Participants' code: 0-20=year 4; 21-40=year 5; 41-60=year 6;

Figure 2. Score distribution for 0-6 years for overall domains

3.4.2 Inter-Rater Agreement

Inter-rater reliability is formulated as:

$$\frac{\text{total agreement}}{(\text{agreement} + \text{disagreement}) \times \text{total observers}}$$

From the calculation, it was found that the index is about 0.171521 or 0.17. This figure is too low to be considered as reliable. Therefore, we can conclude that the observers were not in agreement among themselves and this may be due to many factors, which are discussed in the next section.

4. Discussion

The author believes that the-almost-none developmental instrument of highly reliable and valid developed specifically for the local context is the main reason for little comments from the expert panel. During the informal discussions with the experts at the hospital, it was learned that they had been trained to apply developmental norms, which are from the western and more developed country. This research poses an outcry for more research to be carried out to investigate about local children's developmental milestones and for experts to reduce their dependency on western culture. If this is not done in the near future, many children will be misdiagnosed or not receiving necessary interventions. Alternatively, it could simply mean that teachers do not practice appropriately to serve local people.

Index for inter-rater agreement was found very low and this could be due to the fact that observers were not trained on how to observe children naturalistically, and it could also mean that they had little training on developmental milestones of young children on practical manner. From the findings, the author concluded that intensive training is vital for the score and interpretations of the score could be deemed as reliable. Teacher training on how to create an effective learning environment could also be another vital factor to be improved since developmental milestones of young children must be observed naturally so does the learning environment—physical and social.

The current research focuses on the content validity, which mainly were involved around translation, expert review and one-off observation. Therefore, future studies must focus on the more complex data collection and statistical analyses in order for the instrument to be established as reliable and valid for use in local context. Lastly, collaboration is an element for implementing authentic assessment procedures, and thus in the future it is suggested that family and other professionals be involved during the whole study.

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References

- Aiken, L. R., & Groth-Marnat, G. (2006). *Psychological testing and assessment* (12th ed.). Boston: Pearson Education Group Inc.
- Bricker, D., Pretti-Frontczak, P., Johnson, J., & Straka, E. (2002). *Assessment, Evaluation, and programming system for infants and children: administration guide* (2nd ed.). Volume 1-4. Maryland: Paul H. Brookes Publishing Co., Inc.
- Cohen, R. J. & Swerdik, M. E. (2002). *Psychological testing and assessment* (5th ed.). Boston: McGraw-Hill Companies, Inc.
- Cole, M. (2005). In M. H. Bornstein, & M. E. Lamb, (2005), *Developmental science: An advanced textbook* (5th ed.). New Jersey: Lawrence Erlbaum Associates, Publishers.
- Dahlberg, G., Moss, P., & Pence, A. (1999). *Beyond quality in early childhood education and care: Postmodern perspectives*. London: Falmer Press.
- Glaser, R. (1971). A criterion-referenced test. In W. J. Popham (Ed.), *Criterion-Referenced Measurement: An Introduction*. New Jersey: Educational Technology Publications.
- Gonzalez-Mena, J. (2005). *Foundations of early childhood education: Teaching children in a diverse society* (3rd ed.). New York: Mc-Graw Hill.
- Grisham-Brown, J., & Pretti-Frontczak, K. (2011). *Assessing young children in inclusive settings: The blended practices approach*. Maryland: Paul H. Brookes Publishing Co.

- Grisham-Brown, J., Hallam, R., & Brookshire, R. (2006). Using authentic assessment to evidence children's progress toward early learning standards. *Early Childhood Education Journal*, 34(1), 45-51. <http://dx.doi.org/10.1007/s10643-006-0106-y>
- Hambleton, R. K. (2005). Issues, design, and technical guidelines for adapting tests into multiple language and cultures. In R. K. Hambleton, P. F. Merenda, & C. D. Spielberger (Eds.), *Cross-cultural Adaptation of Educational and Psychological Tests: Theoretical and Methodological Issues* (pp. 1-38). New Jersey: Lawrence Erlbaum Associates, Inc.
- International Test Commission. (2010). *International Test Commission Guidelines for Translating and Adapting Tests*. Retrieved from <http://www.intestcom.org>
- Kaplan, R. M., & Saccuzzo, D. P. (2001). *Psychological testing: Principles, applications, and issues* (5th ed.). Belmont: Wadsworth/Thomson Learning.
- Macy, M., & Hoyt-Gonzales, K. (2007). A linked system approach to early special education eligibility assessment. *Teaching Exceptional Children*, 39(3), 40-45. Retrieved from <http://proquest.umi.com.ezplib.ukm.my/pqdweb?did=1191873751&sid=8&Fmt=3&clientId=39290&RQT=309&VName=PQD>
- Merenda, P. F. (2005). Cross-cultural adaptation of educational and psychological testing. In R. K. Hambleton, P. F. Merenda, & C. D. Spielberger (Eds.), *Cross-cultural Adaptation of Educational and Psychological Tests: Theoretical and Methodological Issues* (pp. 1-38). New Jersey: Lawrence Erlbaum Associates, Inc.
- Ministry of Education, Malaysia. (2009). *Deraf Kurikulum Standard Prasekolah Kebangsaan*. Putrajaya: Ministry of Education, Malaysia.
- Ministry of Education, Malaysia. (2010a). *National Standard for Preschool Curriculum 2010: Orientation course powerpoint and note*. Putrajaya: Ministry of Education, Malaysia.
- Ministry of Education, Malaysia. (2010b). *National Standard for Preschool Curriculum Implementation: Developmental assessment for preschool children module*. Putrajaya: Ministry of Education, Malaysia.
- Morrison, G. (2006). *Fundamentals of early childhood Education* (4th ed.). Upper Saddle River: Pearson Merrill Prentice Hall.
- Morrison, G. S. (2011). *Early childhood education today* (12th ed.). New Jersey: Pearson Education, Inc.
- Neisworth, J. T., & Bagnato, S. J. (2004). The mismeasure of young children: The authentic assessment alternative. *Infants and Young Children*, 17(3), 198-212. <http://dx.doi.org/10.1097/00001163-200407000-00002>
- Nutbrown, C. (2006). *Key concepts in early childhood education and care*. London: Sage Publication Ltd.
- Popham, W. J. (1978). *Criterion-Referenced Measurement*. New Jersey: Prentice Hall Inc.
- Popham, W. J. (1981). *Modern educational measurement*. New Jersey: Prentice-Hall Incorp.
- Popham, W. J. (2005). *Classroom assessment: What teachers should know?* (4th ed.). Boston: Pearson Education Inc.
- Popham, W. J., & Husek, T. R. (1971). Implications of criterion-referenced measurement. In W. J. Popham (Ed.), *Criterion-Referenced Measurement: An Introduction*. New Jersey: Educational Technology Publications.
- Putrajaya: Ministry of Education, Malaysia. (2002). *National Preschool Curriculum*. Kuala Lumpur: Centre For Curriculum Planning, Ministry of Education, Malaysia.
- Robinson, K. H., & Diaz, C. J. (2006). *Diversity and difference in early childhood education: Issues for theory and practice*. Berkshire: Open University Press.
- UNICEF. (2001). *Conventions on the right of the child*. UNCRC. Retrieved from <http://www.unicef.org/crc/>
- Van de Vijver, F. J. R., & Poortinga, Y. H. (2005). Conceptual and methodological issues in adapting tests. In R. K. Hambleton, P. F. Merenda, & C. D. Spielberger (Eds.), *Cross-cultural Adaptation of Educational and Psychological Tests: Theoretical and Methodological Issues* (pp. 39-65). New Jersey: Lawrence Erlbaum Associates, Inc.

Appendix

List of simplified criteria of development for curriculum-based assessment

Domain	Strand	Goal	Objective
Fine Motor	A Bilateral Motor Coordination	1. Uses two hands to manipulate objects, each hand performing different movements	1.1 Holds object with one hand while the other hand manipulates
		2. Cuts out shapes with curved lines	2.1 Cuts out shapes with straight lines 2.2 Cuts paper in two
Fine Motor	B Emergent Writing	1. Writes using three-finger grasp	1.1 Uses three-finger grasp to hold writing implement
		2. Prints pseudo-letters	2.1 Draws using representational figures
			2.2 Copies complex shapes
			2.3 Copies simple shapes
3. Prints first name	3.1 Prints three letter 3.2 Copies first name 3.3 Copies three letters		
Total	2	5	10
Domain	Strand	Goal	Objective
Gross Motor	A Balance and Mobility	1. Runs avoiding obstacles	1.1 Runs
		2. Alternates feet walking up and down stairs	2.1 Walks up and down stairs
	B Play Skills	1. Jumps forward	1.1 Jumps in place 1.2 Jump from platform 1.3 Balances on one foot
		2. Bounces, catches, kicks and throws ball	2.1 Bounces ball 2.2 Catches ball 2.3 Kicks ball 2.4 Throws ball
		3. Skips	3.1 Hops
		4. Rides and steers two-wheel bicycle	4.1 Pedals and steers two-wheel bicycle with training wheels
Total	2	6	11
Domain	Strand	Goal	Objective
Adaptive	A Mealtime	1. Eats and drinks a variety of foods using appropriate utensils with little or no spilling	1.1 Puts proper amount of food in mouth, chews with mouth closed, and swallows before taking another bite
			1.2 Takes in proper amount of liquid and returns cup to surface
Adaptive	B	2. Prepares and serves food	1.3 Eats a variety of food textures
			1.4 Selects and eats a variety of food types
			1.5 Eat with utensils
			2.1 Prepares food for eating
			2.2 Uses knife to spread food
			2.3 Pours liquid into a variety of containers
			2.4 Serves food with utensil
		1. Carries out all	1.1 Uses toilet paper, flushes toilet, washes hands after using toilet

	<i>Personal Hygiene</i>	<i>toileting functions</i>	1.2 Uses toilet 1.3 Indicates need to use toilet
		2. Washes and grooms self	2.1 Uses tissue to clean nose 2.2 Brushes teeth 2.3 Bathes and dries self 2.4 Brushes or comb hair 2.5 Washes and dries face
	<i>C Dressing and Undressing</i>	1. Unfastens fasteners on garments	1.1 Unfastens button/snaps/Velcro fasteners on garments 1.2 Unties string-type fastener 1.3 Unzip zipper
		2. Selects appropriate clothing and dresses self at designated times	2.1 Put on long pants 2.2 Puts on front-opening garment 2.3 Puts on pullover garment 2.4 Puts on shoes 2.5 Puts on underpants, shorts, or skirt
		3. Fasten fasteners on garment	3.1 Ties string-type fastener 3.2 Fastens button/snaps/Velcro fasteners 3.3 Threads and zips zipper
	Total	7	28
Domain	Strand	Goal	Objective
	<i>A Concepts</i>	1. Demonstrates understanding of colour, shape and size concepts	1.1 Demonstrates understanding of eight different colours 1.2 Demonstrates understanding of five different shapes 1.3 Demonstrates understanding of six different size concepts
<i>Cognitive</i>		2. Demonstrates understanding of qualitative and quantitative concept	2.1 Demonstrates understanding of 10 different qualitative concepts 2.2 Demonstrates understanding of eight different quantitative concepts
		3. Demonstrates understanding of spatial and temporal relations concepts	3.1 Demonstrates understanding of 12 different spatial relation concepts 3.2 Demonstrates understanding of seven different temporal relation concepts
	<i>B Categorizing</i>	1. Groups objects, people, or events on the basis of specified criteria	1.1 Groups objects, people, or events on the basis of category 1.2 Groups objects on the basis of function 1.3 Groups objects on the basis of physical attribute
	<i>C Sequencing</i>	1. Follows directions of three or more related steps that are not routinely given	1.1 Follows directions of three or more related steps that are routinely given
		2. Places objects in series according to length or size	2.1 Fits one ordered set of objects to another
		3. Retells event in sequence	3.1 Completes sequence of familiar story or event
	<i>D</i>	1. Recalls event that occurred on same day,	1.1 Recalls event that occurred on same day, with contextual cues

	<i>Recalling Events</i>	<i>without contextual cues</i>	<i>1.2Recall events immediately after they occur</i>
E	<i>Problem Solving</i>	<i>1.Evaluates solutions to problems</i>	<i>1.1Suggests acceptable solutions to problems</i>
		<i>2.Makes statements and appropriately answers question that require reasoning about objects, situations, or people</i>	<i>1.2Identifies means to goal</i>
			<i>2.1Gives reason for inference</i>
			<i>2.2Makes prediction about future or hypothetical events</i>
			<i>2.3Gives possible cause for some event</i>
F	<i>Play</i>	<i>1.Engages in cooperative, imaginary play</i>	<i>1.1Enacts roles or identities</i>
			<i>1.2Plan and acts out recognizable event, theme, or storyline</i>
			<i>1.3Uses imaginary props</i>
		<i>2.Engages in games with rules</i>	<i>2.1Maintains participation</i>
			<i>2.2Conforms to game rules</i>
G	<i>Premath</i>	<i>1.Counts at least 20 objects</i>	<i>1.1Count at least 10 objects</i>
			<i>1.2Count three objects</i>
		<i>2.Demonstrates understanding of printed numerals</i>	<i>2.1 Labels printed numerals up to 10</i>
			<i>2.2Recognizes printed numerals</i>
H	<i>Phonological Awareness and Emergent Reading</i>	<i>1.Demonstrates phonological awareness skills</i>	<i>1.1Uses rhyming skills</i>
			<i>1.2Segments sentences and words</i>
			<i>1.3Blends single sounds and syllables</i>
			<i>1.4Identifies same and different sound at the beginning and end of words</i>
		<i>2.Uses letter-sound associations to sound out and write words</i>	<i>2.1Write words using letter sounds</i>
			<i>2.2Sound out words</i>
			<i>2.3Produces correct sound for letters</i>
		<i>3.Reads words by sight</i>	<i>3.1Identifies letter names</i>
Total	8	17	37
Domain	Strand	Goal	Objective
	A	<i>1.Uses words, phrases, or sentences to inform, direct, ask questions, and express anticipation, imagination, affect, and emotions</i>	<i>1.1Uses words, phrases, or sentences to express anticipated outcomes</i>
	<i>Social-Communicative Interactions</i>		<i>1.2Uses words, phrases, or sentences to describe pretend objects, events, or people</i>
			<i>1.3Uses words, phrases, or sentences to label own or others' affect / emotions</i>
			<i>1.4Uses words, phrases, or sentences to describe past events</i>
			<i>1.5Uses words, phrases, or sentences to make commands to and requests of others</i>
			<i>1.6Uses words, phrases, or sentences to obtain information</i>
			<i>1.7Uses words, phrases, or sentences to inform</i>
		<i>2.Uses conversational rules</i>	<i>2.1Alternates between speaker/listener role</i>
			<i>2.2Respond to topic changes initiated by other</i>

			2.3Asks question for clarification
			2.4Responds to contingent questions
			2.5Initiates context-relevant topic
			2.6Responds to others' topic initiations
		3.Establishes and varies social-communicative roles	3.1Varies voice to impart meaning
			3.2Uses socially appropriate physical orientation
	B	1.Uses verbs	1.1Uses auxiliary verbs
	Production of Words,Phrase, and Sentences		1.2Uses copula verb "to be"
			1.3Uses third person singular verb forms
			1.4Uses irregular past tense verb
			1.5 Uses regular past tense verb
			1.6Uses present progressive "ing"
		2.Uses noun inflections	2.1Uses possessive "s"
			2.2Uses irregular plural nouns
			2.3Uses regular plural nouns
		3.Ask Question	3.1Asks yes/no question
			3.2Asks questions with inverted auxiliary
			3.3Asks "when" questions
			3.4Asks "why", "who", and "how" questions
			3.5Asks "what" and "where" questions
			3.6Asks questions using rising inflections
		4.Uses Pronouns	4.1Uses subject pronouns
			4.2Uses object pronouns
			4.3Uses possessive pronouns
			4.4Uses indefinite pronouns
			4.5Uses demonstrative pronouns
		5.Uses descriptive words	5.1Uses adjectives
			5.2Uses adjectives to make comparisons
			5.3Uses adverbs
			5.4Uses prepositions
			5.5Uses conjunctions
			5.6Uses articles
Total	2	8	31
Domain	Strand	Goal	Objective
Social	A	1.Interacts with others as play partners	1.1Responds to others in distress or need
	Interaction with Others		1.2 Establishes and maintains proximity to others
			1.3Takes turns with others
			1.4Initiates greeting to others who are familiar
		1.5Responds to initiations from others	
		2.Initiates cooperative	2.1Joins others in cooperative activity

		<i>activity</i>	<p>2.2Maintains cooperative participation with others</p> <p>2.3Shares or exchanges objects</p> <p>3.1Negotiates to resolve conflicts</p> <p>3.2Uses simple strategies to resolve conflicts</p> <p>3.3Claims and defends possessions</p>
		3.Resolves conflicts by selecting effective strategy	
B		1.Initiates and completes age-appropriate activities	<p>1.1Responds to request to finish activity</p> <p>1.2Responds to request to begin activity</p>
Participation		2.Watches, listen, and participates during small group activities	<p>2.1Interact appropriately with materials during small group activities</p> <p>2.2Responds appropriately to directions during small group activities</p> <p>2.3Looks at appropriate object, person, or event during small group activities</p> <p>2.4Remains with group during small group activities</p>
		3.Watches, listens, and participates during large group activities	<p>3.1Interacts appropriately with materials during large group activities</p> <p>3.2Responds appropriately to directions during large group activities</p> <p>3.3Looks at appropriate object, person, or event during large group activities</p> <p>3.4Remains with group during large group activities</p>
C		1.Meets physical needs in socially appropriate ways	<p>1.1Meets physical needs when uncomfortable, sick, hurt, or tired</p> <p>1.2Meets observable physical needs</p> <p>1.3Meets physical needs of hunger and thirst</p>
Interaction with Environment		2.Follows context-specific rules outside home and classroom	<p>2.1Seeks adult permission</p> <p>2.2Follows established rules at home and in classroom</p>
D		1.Communicates personal likes and dislike	<p>1.1Initiates preferred activities</p> <p>1.2 Selects activities and/or objects</p>
Knowledge of Self and Others		2.Understands how own behaviours, thoughts, and feelings relate to consequences for others	<p>2.1Identifies affect/emotions of others</p> <p>2.2Identifies own affect/emotions</p>
		3.Relates identifying information about self and others	<p>3.1 State address</p> <p>3.2State telephone numbers</p> <p>3.3State birthday</p> <p>3.4Names siblings and given full name of self</p> <p>3.5States gender of self and others</p> <p>3.6States name and age</p>
Total	4	11	36

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