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Development of authentic assessment model in the field of mathematic for early childhood in Palembang City

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Abstract. The focus of this research is to develop a valid and reliable of authentic assessment models in the field of mathematic for children aged 6-7 years. This research is Research and Development (R&D) that produce the product in the form of authentic assessment model in the field of mathematic for early childhood. This product is standardized through expert validation. The step of this research is planning, development, and evaluation. Data were analysed using formative evaluation consists of expert review, one to one evaluation, and small group evaluation. The result of the research shows that the model of authentic assessment in the field of mathematic for early childhood has been produced.

1. Introduction

Envision these children using problem-solving, reasoning, critical thinking, and learning skills in practical and astonishing ways. The creative tasks that children accomplish in these rich environments enable them to produce writing, projects, experiments, portfolios, and other innovative products of their learning. As students engage in such programs, teachers need to develop a comprehensive and precise method of assessing the knowledge, skills, and work habits that students demonstrate. Students themselves should play a leading role in creating assessment and evaluation procedures that shape their learning and measure the quality of their work.

Authentic assessment is an effort to help teachers in early childhood classroom to implement performance-based learning and authentic assessment practices throughout the curriculum. The assessment units and performance tasks featured here transpired from years of teaching and learning with young people of diverse backgrounds and different ability levels. The practical strategies and examples are meant to provide models for program development and assessment design. Whether you are new to performance-based learning and authentic assessment, or interested in enhancing learning and current practices, this resource should provide you with practical, creative, and inspiring ideas to use in your teaching. Assessment authentic can be thought of as a “more realistic subset of performance assessments” because they require performances that parallel to those in the real world [1].

Early childhood is period when kids effectively take part in securing central ideas and learning key procedure aptitudes. Ideas are the structure squares of information; they enable individuals to sort out and classify data. Ideas can be applied to the arrangement of new issues that are met in regular experience. As we watch youngsters in their ordinary exercises, we can watch them and utilizing ideas.

As little youngsters leave toddlerhood and enter the preschool and kindergarten levels of the preprimary period, investigation keeps on being the initial phase in managing new circumstances; right now, be that as it may, they likewise start to apply essential ideas to gathering and arranging



information to address an inquiry. Gathering information requires expertise in perception, tallying, recording, and sorting out. Essential kids may tackle a similar issue yet can work more work all the more freely and record more data, utilize standard estimating instruments, and do foundation perusing alone.

Science for early childhood is a perspective on youngsters. For kids, learning science is critical to their concern comprehend aptitudes. In this manner, learning science for youngsters isn't just learning numbers, yet it can incorporate checking, arranging, estimating, constructing and depicting shapes, discovering designs, evaluating, among different encounters [2].

Table 1. The development of math concepts and process skills.

Period	Concepts and Skills: Beginning Points for Understanding			
	Section II Fundamental	Section III Applied	Section IV Higher Level	Section V Primary
Preoperational (2 to 7 years)	Sets and classifying Comparing Counting Parts and wholes Language	Ordering, seriation, patterning Informal measurement: Weight; Length; Temperature; Volume; Time; and Sequence Graphing	Number symbols Sets and symbols Concrete addition and subtraction	-

2. Method

The method used in the research is development research. This research development method was adopted from the main three elements of [3] model - planning, design, and evaluation as shown in the Figure 1.



Figure 1. Model of instructional design.

The data collecting instrument in the study used a validity questionnaire that was first validated by the experts. Questionnaire has four scales with criteria very good, good, average, and not good. Data were analysed using formative evaluation consists self-evaluation, expert review, one to one evaluation, and small group evaluation. Validators in this research are Dra. Syafdaningsih, M.Pd (content expert) and Dra. Yetty Rahelly, M.Pd., Ph.D (media expert). The validation data obtained has

been processed using the average analysis for the final result to interpret the entire product. The interpretations values of validity data are 76-100 is very valid/ practical, 51-75 is valid/ practical, 26-50 is invalid/ unpractical, and 0-25 is highly invalid/ unpractical.

3. Result and Discussion

This research develop a product in the form of authentic assessment model in the field of early childhood mathematics that is suitable for development of children aged 6-7 years and can easy to be use by teachers. In the planning stage, the researchers conducted a six stages, namely: 1) define the scope of the boundary, in the form of an authentic assessment model; 2) identification characteristic of children, that is cognitive development especially mathematic for children aged 6-7 years; 3) setting limitations, that is the teacher has difficult to assessing a children's abilities in the field of mathematics; 4) need analysis, that is the teachers needs an authentic assessment model that is appropriate with child's development and easy to use; 5) conduct discussions, that is the researchers offer product in the form of authentic assessment model that are easy to use by teachers and accordance with material of mathematic and development of children aged 6-7 years; and 6) client agreement, in the form of agreement from 15 of teachers to try and implement an authentic assessment model in the field of mathematic for early childhood.

At the design stage, the researchers uses three stages, namely: 1) develop ideas, the researchers used several kinds of authentic assessment models, that is anecdotal records [4], checklists, rating scales, and rubrics are instruments that can be used for evaluation purposes [5], interview data have been given more weight that data from other assessment methods [6], directed assignment, games, and portfolios [7]; 2) make an analysis concepts, the researchers developed an authentic assessment model that focused on material big and small (size), light and heavy (weight); square and round (shape); late and early (time), long and short (length), and so on [8]; and 3) choose software, the researchers used Microsoft Word and Publisher to make a product.

In the last stage that is evaluation stage, the researchers used expert review, one to one evaluation, and small group evaluation. In the expert review evaluation, the researchers involved two experts, that is an expert in the field of media to develop the authentic assessment model and an expert in the field of content about mathematic for early childhood. The validation result of processing media expert as shown in Table 2.

Table 2. The results of processing media validation.

No	Aspects	Total of Questions	Scales				Total
			4	3	2	1	
1	The consistency of the elements contained in each authentic assessment	6	3	3	-	-	21
2	The suitability of technical and appearance in each authentic assessment	7	5	2	-	-	26
3	The suitability of technical and appearance on the supplementary pages	7	5	2	-	-	26
		Total				73	
		x				91.25%	
		Category				Very Valid	

The conclusion is the model of assessment authentic ease of interpretation, full meaning, and can be feasible to be used [9]. Whereas, the validation from media expert as shown in the Table 3.

Table 3. The results of processing content validation.

No	Aspects	Total of Questions	Scales				Total
			4	3	2	1	
1	Contents	4	3	1	-	-	15
2	Construct	4	3	1	-	-	15
		Total					30
		x					93.75%
		Category					Very Valid

The conclusion is model of authentic assessment has been accordance with the mathematics material of children aged 6-7 years, that is early numeracy skills and sensitivity to detect differences in early mathematics performance among young children [10], develop as a sequence of connected concepts and skills, develop a brief measure of broad skills [11], verbal counting, object counting, number recognition, number comparison, number sequencing, number composition and decomposition, and adding and subtracting, part-whole thinking and the corresponding processes of composition and decomposition, classification, and seriation [12], etc. The validation result of one to one evaluation as shown in the Table 4.

Table 4. The validation result of one to one evaluation.

No	Name of Kindergarten	Content Indicator	Practical Indicator	Total Score
1	Pembina 1	23	14	37
2	Izzuddin	23	15	38
3	Kartika 2-1	21	15	36
Average				92.5%

The validation result of small group evaluation as shown in the Table 5.

Table 5. The validation result of small group evaluation.

No	Name of Kindergarten	Content Indicator	Practical Indicator	Total Score
1	A	23	14	37
2	B	23	15	38
3	C	21	15	36
4	D	24	14	38
5	E	23	15	38
6	F	23	15	38
7	G	22	15	37
8	H	22	15	37
9	I	19	15	34
10	J	22	14	36
11	K	23	15	38
12	L	23	12	35
13	M	23	13	36
14	N	22	14	36
15	O	23	12	35
Average				91.5%

The conclusion of one to one validation and small group is the model of assessment authentic in the field of mathematic for early childhood can be used very practically by kindergarten teachers, because it meets the minimum development standard of 75%.

4. Conclusion

Based the model of assessment authentic in the field of mathematic for early childhood years are feasible, effective, and practical used to measure the development of mathematic children aged 6-7 years. The criteria are feasible, based on the results of the expert validator shown by the percentage of the average score of 92.5% very valid and the percentage of the average score of 92% practically.

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