

# Measuring Tool of Children's Social-Emotional Development Through Digital Technology

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**Abstract**—Social and emotional factors have a great impact to children development achievement. The study investigated the production a measurement tool using digital technology in children social and emotional development. This measurement property derived from several process such as a needs analyses, a measurement design, and an expert judgment. The data were collected through interview and expert validation. The digital technology that produce the measurement of social and emotional around three subdomains: self-regulation, pro-social behaviour, also responsibility to the self and other in children. The finding showed that (i) the measurement of children social and emotional development appropriate by expert, (ii) three measures were identified as good indicators for broader use with children three to age four, with 12 key features of measurement. This tools provides feedback for caregivers to enhance the children achievement in three subdomains of social and emotional development.

**Keywords**—digital technology, measurement, social and emotional development

## I. INTRODUCTION

Research in social-emotional development have been in existence for decades [1] and the purposes are understanding and supporting the children direct interactions and engagement with peers expands [2], also with larger community and society where they live in [3]. Social-emotional development defines as the developing capacity of child from birth through 5 years' ages [4], that reflect to children's behaviours, skills and knowledge, also features of the context in which children grow, learn, and play [5]. Social-emotional development in early years of children is an essential foundation for their later success and wellbeing in the future [6].

The challenges to understand and support the young children is determining the good measures to assess the progress of social and emotional domain in the beginning of their social-emotional development [7]. To broadly held objective of understanding of young children's social-emotional competencies with school readiness, it uses the keys conceptual for measurement. It is clearly stated that measurement is important.

Key conceptual issues include the need to more clearly identify the borders of social and emotional development, those that separate it from other key domains (such as cognitive development), and to more clearly delineate and distinguish the subdomains of social and emotional development (such as emotional competence) and the specific constructs within these [8]. To bridge the information and understanding gaps regarding assessment of early social-emotional competence, we need a model of how such assessment can be useful, a plan for using assessment, and criteria for selecting amongst extant assessment tools [2]. However, the gaps in this research are developing the specific subdomains of young children's social-emotional development and the right tool to measure it.

The result analyses based on the interviews with caregivers in childcare in Bandung that there is a need to produce of the social-emotional development measurement. It is stated that the previous measurement of the social-emotional development through daily reports that consist the children activities from the beginning to the end of day in the childcare. This measurement taken too much time that imply to the caregivers' performance to stimulate the child development achievement is slow. This childcare is located in one of state university in West Java Province that held child services for children of university employee and public. However, regarding to numerous job activities of the caregiver, they found difficulties to measure the children's social emotional development with the manual measurement tool based on paper. Practitioners and educators dealing with young children in early education and childcare program need an assessment as they plan, implement and evaluate the effectiveness of the learning needs of their pupils and provide appropriate scaffolds for their skill development [9,10].

Thus, this research tries to identify the effectiveness of measurement instrument that the result lead to provide a developmentally appropriate experiences and monitor individual child progress. The study investigated the production a measurement instrument in children's social-emotional development through digital technology

**II. METHODS**

This study uses a descriptive method, and the measurement properties derived from several process such as a needs analyses, a measurement design, and an expert judgment (Fig. 1). The data were collected through interview and expert validation.

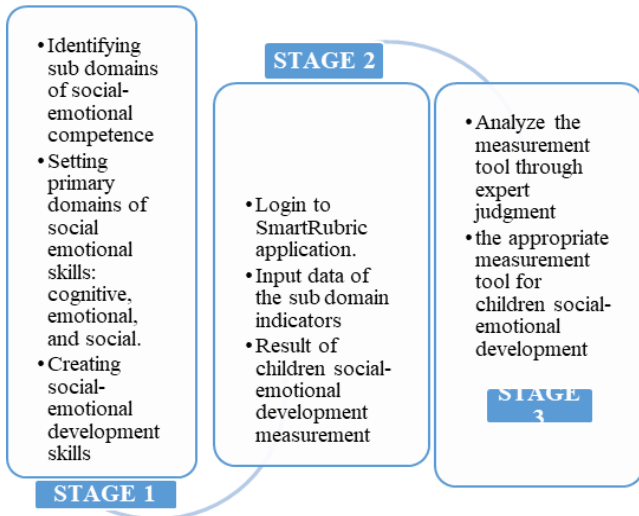


Fig. 1. Stages of measurement instrument production.

**III. RESULTS AND DISCUSSION**

The results of expert judgment in this study include stimulus or habituation as an aspect of measurement and a validated form of measuring instrument for children's development in the development of measuring instruments for children's social-emotional development in childcare. This study involved several validators consisting of measurement experts from academia, subject matter experts, and day care managers to test the feasibility of the measurement instruments that had been designed.

*A. Validation from Measuring Expert*

Validation of the measurement instrument for children's social-emotional development in childcare was carried out by measuring experts, namely two lecturers who taught about measurement in education.

TABLE I. VALIDATION INSTRUMENT FROM MEASUREMENT EXPERT

No	Rated Aspect	Score		Total	A
		I	II		
1.	Formulation of indicators on the measuring instrument sheet of children's socio-emotional development.	1	1	2	1
2.	The form of the instrument for measuring the socio-emotional development of children aged 3-4 years is in the form of a checklist in which there are four scales for measuring child development as follows: a. Beginner (B), it means not yet developed, if children do it must be guided or exemplified by the teacher; b. Intermediate (I), if the child does something, the teacher still needs to remind or assist him; c. Advance (A), developing according to expectations, if the child is able to do it independently and consistently without having to be reminded or exemplified by the teacher; d. Mastery (M) developing very well, if the child is able to do it independently and has been able to help friends who have not reached the ability according to the expected indicators.	1	1	2	1
3.	<b>Instructions Aspect</b> The explanation of statement of instructions for filling in the measurement sheet for social-emotional development of children aged 3-4 years	1	1	2	1
4.	<b>Construction Aspect</b> Display of instruments and aspects measured and measurement criteria	1	1	2	1
5.	<b>Language Aspect</b>				
	a. Using language that is in accordance with the rules of good and correct in Indonesian.	1	1	2	1
	b. Using simple language and it is easy to understand.	1	1	2	1
	c. Using precise terms and easy to understand.	1	1	2	1
6.	<b>Readability Aspects</b>				
	a. The letter size on the measuring instrument is appropriate and can be read properly.	1	1	2	1
	b. The use of spaces in writing is good.	1	1	2	1
	c. The sentences used do not use words that can be interpreted as double (ambiguous).	1	1	2	1
7.	<b>Presentation and supporting aspects</b> The coherence of the presentation of measurement instruments for children's socio-emotional development.	1	1	2	1
8.	A note at the end of measuring the socio-emotional development of children.	1	1	2	1
<b>Total</b>					12
<b>Percentage (%)</b>					<b>100 %</b>

The result of the validation was show at Table 1; it indicates that the measurement instrument for the socio-emotional development of children in childcare measuring by an experts obtained a 100% percentage of eligibility. Thus, the instrument was declared very suitable for use in children development measurement at childcare. Suggestions from measurement expert 1 and 2 on the language aspect is to use the appropriate words in terms of children development. The word "information" is changed to "indication", the word

"which" is changed to "namely"; the words "lend" and "borrow" should not be used in one sentence.

#### B. Validation from Material Expert

Validation of the measurement instrument for children's socio-emotional development in childcare was carried out by material experts, namely one-day care manager and two lecturers who taught child development.

TABLE II. VALIDATION INSTRUMENT FROM MATERIAL EXPERT

No	Aspect	Score			Total	Average Score
		I	II	III		
<b>A. Self-regulation</b>						
1	Aspects that are measured in indicators follow the activities in a large activity.	1	1	1	3	1
2	The aspects measured on the indicators imitate what adults do.	1	1	1	3	1
3	The aspects measured on the indicator react to things that are not true.	0	1	1	2	0,67
4	Aspects that are measured on the indicators say feelings verbally.	1	0	1	2	0,67
<b>B. Self-responsibility and others</b>						
5	The aspect measured on the indicator that children can urinate without assistance.	0	1	1	2	0,67
6	The aspect measured on the indicator that children can be patient waiting their turn.	1	1	1	3	1
7	The aspect measured on the indicator that show tolerance so they can work in groups.	1	1	1	3	1
8	The aspect measured on indicator that have ability to respect other people.	1	1	1	3	1
9	The aspect measured on indicator that have regret expression when making mistake.	0	1	1	2	0,67
<b>C. Pro-social Behaviour</b>						
10	The aspect measured on indicator to build teamwork.	1	1	1	3	1
11	The aspect measured on indicator to understand the feeling.	1	1	1	3	1
12	The aspect measured on indicator to borrow and lend toys.	1	1	1	3	1
<b>Total</b>						10,68
<b>Percentage (%)</b>						<b>89 %</b>

Table 2 show the results of the validation of the measurement instrument for the socio-emotional development of children in childcare by material experts and child care managers after a scale of 100 obtained the proportion of eligibility of 89%, indicating that the measurement instrument was declared very suitable for use in childcare. The suggestion that come from material expert 1, material expert 2 and material expert 3 on indicator aspects.

The results of expert judgment from the validation on the structure of the instrument and the measurement aspects made by several validators obtained an eligibility percentage of 94.5%, indicating that the measurement instrument for socio-emotional development of children aged 3-4 years old was very feasible, so that the measurement instrument of childcare can be used.

The result analyses based on the interviews with caregivers in childcare that there is a need to produce of the social-emotional development measurement. It is stated that the previous measurement of the social-emotional development through daily reports that consist the children activities from

the beginning to the end of day in the childcare. This measurement taken in much time that imply to the caregivers' performance to stimulate the child development achievement is slow. Early childhood development has different levels of achievement according to the child's age level. Likewise, children aged 3-4 years have different standards of developmental achievement compared to those under or above [11]. Rumah Bunda childcare implements stimuli to help achieve children's social-emotional development according to age level, so to find out the children's development achievements, a child development instrument is needed.

Rumah Bunda childcare applies measurement of child development achievement with the final result in the form of a report on the achievement of child development. The measurement process is initially carried out by observing, but the observations have not used the appropriate measurement instruments. The measurement process has not been carried out accurately, so feedback is not obtained as expected. This feedback is needed to make improvements in providing stimulus in an effort to help the socio-emotional development of children according to their age [12].

The child development measurement instrument used to measure the socio-emotional development of children aged 3-4 years has not yet been provided in Rumah Bunda childcare. In this condition, it is necessary to make a measurement instrument which purpose is to serve as a reference for childcare managers when measuring the socio-emotional development of children aged 3-4 years. Measurement instruments are made to assist the observation process, but it also needs to be assisted by recording. Measuring and recording instruments were carried out for the purpose of being a reminder note. Children carry out various activities, educators can observe all activities carried out by children or what children say, including face expressions, movements, and children's work. In making observations, educators need to take notes as evidence as well as reminders of all the activities they observe [13].

The analysis of the results of the development in measuring instruments for the socio-emotional development of children in childcare is based on the analysis of the needs of measurement instruments that in Rumah Bunda childcare have not used measurement instruments to determine the socio-emotional development of children aged 3-4 years. This condition indicates that it is necessary to develop an instrument for measuring the socio-emotional development of children aged 3-4 years. Measurement results using the right and reliable instruments will provide accurate information [14].

The development of measurement instruments carried out by researchers was made according to the stimulation or habituation in Rumah Bunda childcare. The stimulation or habituation that is applied in Rumah Bunda childcare becomes the formulation of the measured aspects in the development of measurement instruments using Indonesian language and easy to understand. Stimulation or habituation that is applied in Rumah Bunda childcare in order to help achieve the socio-emotional development of children aged 3-4 years, then in formulating the measured aspects based on the indicators of the level of achievement of socio-emotional development of children aged 3-4 years in the Indonesian Minister of Education and Culture Regulation No. 137 of 2014.

In the process of measuring the socio-emotional development of children using observation techniques assisted by recording a checklist. This checklist technique is considered quite relevant to use because this checklist technique is arranged in a table with 4 scales of measuring the child's developmental status based on observations [15].

The results of the validation of the instrument for measuring the socio-emotional development of children in childcare were stated to be very suitable for use in childcare after revisions were made to the language aspects as suggested by the two measurement experts. The revision made was that the word "description" was changed to "guidance", the word "which" was changed to "namely"; the words "lend" and "borrow" are not used in one sentence. Measurements are carried out as a first step in seeing the child's growth and development process after a stimulus or habituation is given, so

measurement instruments need to be assisted so that there is a reference. The measurement instrument made must use "words" that are easy to understand and the sentence structure uses good and correct Indonesian language rules and uses precise and terms which is easy to understand [16].

The results of the validation of the instrument for measuring the socio-emotional development of children in childcare were stated to be very suitable for use in childcare after revisions were made to the indicators and measured aspects as suggested by the three material experts.

The results of the revision of the measurement instrument for children's socio-emotional development in the form of measured aspects and measurement indicators, there are several changes from those formulated at the beginning. Change includes aspects that are measured and the formulation of indicators includes providing specific examples, the use of language, words and terms that can be understood by readers.

The measured aspect relates to the child's socio-emotional development ability according to developmental skills at the age of 3-4 years, after the child has received stimulation and experiences in everyday life.

This measurement tool with three sub-domains is transferred to digital technology using the Smart Rubric program. The smart rubric can support and facilitate academics and administrative workers by suggesting a prioritized accurate action plan according to the criterion/ practice performance evaluation [17]. The various approaches to constructing rubrics in a sense also can be characterized to be holistic or analytical. Analytical rubrics use discrete criteria to set forth more than one measure of the levels of an accomplishment for a particular task, as distinguished from holistic rubrics, which provide more general, uncategorized ("lumped together") descriptions of overall dimensions of quality for different levels of mastery [18]. The production of measurement tool of children social-emotional development using Smart rubric that used effectively, contain all three of subdomain provide children with criteria of beginner, intermediate, advance and mastery, and provide caregiver with performance measurement and grading criteria. By clearly delineating performance expectation, rubrics help children move toward higher levels of performance and simultaneously ensure caregiver apply developmentally appropriate practices for the children [19].

#### IV. CONCLUSION

The digital technology that produce the measurement tool of children social-emotional development around three subdomains: self-regulation, pro-social behaviour, also responsibility to the self and other in children.

This tools provides feedback for caregivers to enhance the children achievement in three subdomains of social-emotional development through imply the *appropriate scaffolds for their skill development*.

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