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Development of Learning Methods through Songs and Movements to Improve Children's Cognitive and Psychomotor Aspects

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Abstract: Cognitive and psychomotor are two aspects that play an important role in children's development, especially at the pre-school age. This study aims to create and test products in the form of learning methods with song and movement to improve children's cognitive and psychomotor aspects. This research is a research and development using 4D theory from Thiagarajan, Semmel, and Semmel. There are four phases in this research, namely the define phase, product design, product development, and dissemination. Data analysis used in this study was a qualitative and quantitative approach using instruments in the form of questionnaires, product validation sheets, and learning observation sheets. The collected data is then analyzed using two analytical techniques: (1) qualitative data with content analysis techniques and (2) quantitative data analyzed statistically with the help of SPSS. The results showed that this learning method was proven to have a level of validity, practicality, and effectiveness above the standard to improve children's cognitive and psychomotor aspects.

Keywords: *Cognitive, development, psychomotor, song and movement.*

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Introduction

Education and learning at the pre-school level play an essential role in the development process of children. That is, pre-school education is seen as a necessary education level in developing various domains, such as the social domain of communication, the formation of gross and fine motor skills, adaptive abilities, and social skills (Samsudin et al., 2019). For this reason, curriculum and learning strategies at the pre-school level need to be prepared carefully and systematically in supporting the acquisition of various domains.

Pre-school age for children is the most certain age to get a variety of skills to the maximum. Furthermore, pre-school age is also a period for children to develop performance abilities, executive functions, motor skills, cognition, language, and social (Anderson & Reidy, 2012). In a broad context, the age of children in pre-school is considered creative and full of surprises for children (Santrock, 2011).

Until now, pre-school education consisted of various teaching and learning strategies. In Indonesia, pre-school education curriculum is packaged by incorporating multiple learning strategies, including (1) student-centered learning, (2) games, (3) inquiry-based learning, (4) integrated learning, (5) theme-based learning, (6) mastery approach, (7) multi-faceted learning intelligence, (8) project-based learning, and (9) contextual learning. These approaches are used in the learning process at that level because they prioritize fun learning or entrepreneurial learning, which is a natural behavior for children (Pogue, 2018).

In learning and teaching, there is still no approach or learning technique that is ordained as the most effective approach to be applied in class (Walton, 2014). However, the song & movement method is considered a technique commonly used for children at the pre-school level. This is based on the fact that music, song, and movement is one of the teaching

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activities that is based on creativity and aesthetics (Pica, 2013). Music, movement, and drama are also seen as essential aspects that can support children's development (Bosco, 2002).

At present, the majority of pre-school learning involves children with various abilities. This condition refers to the multiple intelligence theory, which is an educational theory by placing multiple intelligences as its primary focus (Gardner, 2003). This theory states that each child has a different intelligence. Thus, the learning method using songs, music, and movement is one of the creative and innovative ways of teaching at the pre-school level (Yakoob, 2007). Besides these methods, other methods often applied at this level are singing, telling stories, and playing roles (Arshad, 2012).

Two valuable domains in pre-school that must be developed are cognitive and psychomotor. At present, issues and literature on pre-school education emphasize more on both aspects to increase children's lifetime participation in physical activity (Kambas et al., 2002). To stimulate and improve both aspects, teachers usually use appropriate learning methods, one of which is the song & movement method.

There are several studies relating to the use of the song & movement method for preschoolers in improving cognitive and motor aspects. The song & movement method can improve children's critical thinking and literacy skills (Salmon, 2010). This method is also proven to provide opportunities for children to develop their motor skills so that they contribute to strengthening the bonds of friendship between children (Kralova & Kolodziejski, 2016). A study proves that the song & movement method gives a positive influence on special children to correct neglectful behavior, anger, and anxiety levels of children (See, 2012).

Of the many studies on the above topic, there are still very few researchers/teachers who conduct surveys using research & development designs. With this research, teachers are expected to be able to develop their creativity and innovation in learning. Research and development that places teachers and students as learning citizens to participate in developing learning products is an excellent reason to use this research design (Cothran et al., 2003).

Based on the description, there are three research questions in this study, namely: (1) how is the analysis of needs in the development of learning methods with the song & movement method? (2) how is the learning design with the song & movement method in improving cognitive and psychomotor aspects children? And (3) the level of validity, practicality, and effectiveness of learning with song & movement methods in enhancing children's cognitive and psychomotor aspects?

Literature Review

Cognitive and Psychomotor

Simply stated, cognitive is interpreted as an essential aspect of children's development related to the ability to learn or think. In other words, cognitive is a domain of "thinking" focused on intellectual skills and is very close to educators (Kasilingam et al., 2014). Furthermore, this domain is also closely related to the process of how students acquire and utilize knowledge.

Piaget has developed the cognitive theory in children through its constructivist approach. Based on this theory, children develop through a series of cognitive development stages into adulthood (Pierce, 2013). Another thing to note is that cognitive processes for children not only take knowledge from adults but also develop ways to get to know the world (Ginsburg et al., 2003).

Cognitive development is the development of one's mindset and the ability to understand something or solve simple problems (Amalia & Khoiriyati, 2018). The development of this aspect is usually also related to the change and growth of perception, memory, performance, understanding, knowing, evaluating, and thinking or reasoning on an ongoing basis (Kazu & Is, 2018; Owens, 2008; Rao et al., 2014; Shaffer & Kipp, 2013).

Cognitive development includes all changes such as understanding, remembering, reasoning, deciding, and solving problems in mental processes (Sonmez, 2017). Piaget claims that knowledge and discovery start from the birth of a child to continue for a lifetime along with the learning process (Yesilyaprak, 2006).

Psychomotor is another aspect that must also be developed as long as children take pre-school education. This aspect is essential because it has significant relevance to the attitude development of children (Martinez-Moreno et al., 2020). Psychomotor is related to kinaesthetic intelligence, one of the nine human intelligences or multiple intelligences (Gardner, 2003).

Psychomotor aspects can be divided into the gross motor and excellent motor aspects. Gross motor refers to movements involving large muscles, while fine motor refers to smaller muscles (Shulman & Singleton, 2010). Significant muscle activity in gross motor function includes the trunk muscles used for sitting and leg muscles for walking. Fine motor is related to the small muscles used by fingers and tongue for writing and speaking activities. In various studies, cognitive and psychomotor domains are included in many aspects, which have slowed their development. Thus, teachers can prevent the negative consequences of the slowdown through classroom learning methods (Carboni-Rohman et al., 2006; Cueto et al., 2017).

Song & Movement Learning Method

In classroom learning, children internalize the learning process by seeing what their teacher teaches (Faradiba et al., 2019). If they do not enjoy the conditions of learning, it can affect their lack of motivation in participating in class. For this reason, we need a learning method that is appropriate and fun for children.

The teaching method is a type of activity used by the teacher in teaching that refers to the procedure in an approach (Gill & Kusum, 2017). There are many methods used in the learning process. However, it should be noted that each field or type of content has its method (Safapour et al., 2019; Uzunboylu & Ozcan, 2019). That is, one method may not be suitable for learning two different materials.

One of the standard methods used in learning in pre-school is the song & movement method. This method is done by singing by moving the limbs. Singing and moving the body are two activities that have a close relationship because they can affect the child's nerve performance (Erickson et al., 2015; Febriyona et al., 2019).

Experts state that song, movement, and play are neurological activities that promote speech, sensory-motor skills, and vital movement abilities (Crees et al., 2010; Sahiu & Wijaya, 2017). This method is also considered capable of improving children's cognitive development and even for children with learning difficulties (Palupi et al., 2019; Portowitz & Klein, 2007).

Martin (2017) states that learning outcomes can be maximized better if there are several pathways in the children's brain. This means that brain pathways can be done by learning to do, say, see, listen, and participate in multisensory learning experiences. This indicates that the song & movement method is closely related to improving children's cognitive and psychomotor aspects (Chandler & Tricot, 2015).

Methodology

This research is educational research devoted to the education of Christianity in the church by using research & development (R & D) approach. Research with R & D design is carried out to produce an educational product used to overcome problems in the field (Helaluddin, 2014). The research & development theory used in this research is the 4D theory, which consists of: (1) the define stage, (2) design, (3) develop, and (4) disseminate (Thiagarajan et al., 1974).

Research Locations & Subjects

This research was conducted at a Sunday School in one of the Indonesian Gospel Campsites Church, namely GKII Regional I of South Sulawesi in Makassar City, Indonesia. Besides, the participants in this study were teachers and students of the Sulselbar GKII Sunday School. There were eight teachers and 20 children included in this study, with ages between 3 and 6 years from four different Sunday schools.

Furthermore, other groups are used as research subjects. The group is the experts who are asked to provide an assessment of the products developed by two people.

Collection & Analysis Data

Define Phase

In this initial phase, researchers used observation and documentation techniques to obtain information from the field about conditions that occurred. The observation technique is a means of collecting data in naturally observing the environment to get an overview of events (Arslan, 2018). Observations were made on four Sunday schools in Makassar City with each duration of approximately 2 hours. Also, documentation techniques are carried out by analyzing various documents related to this topic, such as curricula, textbooks, and other reference books. The data obtained in this phase are then analyzed using qualitative methods by describing the field's findings.

Design Phase

This second phase does not use research instruments because this phase contains researchers' activities to design development products based on the results of the previous phase.

Develop Phase

In the third phase, the researcher conducted a validity test, a practicality test, and an examination of the developed product's effectiveness. The instruments used in this phase are: (1) validation sheets addressed to experts, (2) teacher activity observation sheets, (3) learning implementation observation sheets, (4) child activity sheets.

In this study, data collection used two types of instruments, such as observation sheets and teacher response questionnaires. Furthermore, the observation sheet consists of (1) student activity sheet and (2) student development results sheet.

Data obtained through several research instruments were analyzed using qualitative and quantitative approaches. A qualitative approach is used to analyze data in the needs analysis phase by describing some findings from observations and literature review. On the other hand, to test the validity, practicality, and effectiveness of the products developed using a quantitative approach using the help of the SPSS program (Istiyono et al., 2019). The validity level is determined by the formula (Ahmar & Rahman, 2017):

$$\overline{X} = \frac{\sum_{j=1}^{n} Aij}{n}$$

Information: $\overline{X}$ = total average

Ai = average i-aspect

n = many aspects

The calculation results are then compared with the following range table to determine the criteria (Ahmar & Rahman, 2017).

Table 1. Validation Categories

Value range	Category
3.5 ≤ X ≤ 4.0	Very valid
2.5 ≤ X 3.5	Valid
1.5 ≤ X ≤ 2.5	Valid enough
X ≤ 1.5	Invalid

Research Procedure

In research & development, there are several phases to identifying needs for the phase of disseminating products. Since this research uses the 4D theory, the research phase includes four phases: the defining, design, development, and dissemination phases.

Phase 1: Define Phase

The first phase in this research and development is the defining stage. This phase is also called the preliminary study phase by gathering information related to the research topic (Brown, 2001; Sothan, 2015). In some literature, activities in the defining period need analysis or need assessment (Helaluddin, 2018; Bedoya at al., 2015).

In this phase of defining or analyzing needs, the researcher carries out initial activities such as analyzing documents, such as curriculum analysis, textbooks, and other literature relating to the research theme. Besides, researchers also observe the implementation of learning to find problems in the field. After the needs analysis phase is completed, the researcher then formulates the specifications of the learning objectives realized in several teaching indicators.

Phase II: Design

The next phase after the activity analysis needs is the product design phase. In this phase, the researcher designs the product that first formulates: (1) preparation of the instrument, (2) selection of the assessment format, and (3) initial design of the product. The product developed in this study teaches and learning with dance and motion approaches to improve students' cognitive and psychomotor aspects. Some of the products produced in this study are (1) teaching material guidelines, (2) weekly activity plans, (3) teacher activity sheets, and (4) child activity sheets.

Phase 3: Development Phase

The development phase can be separated into three main parts: the validity test, practicality test, and effectiveness test. A validity test is a test conducted to assess the level of product validity by asking several validators to provide an assessment. Second, practicality tests conducted by researchers by observing and giving questionnaires teacher responses to product development. Finally, the effectiveness test was conducted on students to see the improvement of their cognitive and psychomotor aspects after participating in the learning process by using a song & movement strategy.

Phase 4: Disseminate Phase

The last stage in this research is the dissemination phase. This phase is a phase in disseminating products through focus group discussions (FGD) held at the Jaffray College of Philosophy in Makassar, Indonesia, as a research report.

Results

Needs Analysis Results

Non-formal education is an education that is organized outside the school system. This type of education is usually held separately and integrated to carry out activities that are very important to serve the citizens of learning. As stated in Chapter VI of National Education System Law Article 26 paragraph (4): "Non-formal education units consist of course institutions, training institutions, study groups, community activity centers, and similar educational units." Following the National Education System Law, the church can be considered a community activity.

Based on the above, all local church services, both pastoral care, teaching, music, evangelism, and preaching, must be focused on evangelizing, teaching, and equipping. Which includes the church or church members are children, young people, and adults. Early childhood as church members needs to learn and be equipped to grow in teaching the word of God. In teaching God's Word to early childhood, the story method is often used. The story method is a classic method that has long been used today. Because the implementation usually requires specific skills so that the presentation is not boring and can attract students' attention.

One method of learning is conveying subject matter with songs. The use of media by singing and utilizing music is expected to increase the effectiveness of learning so that learning objectives will be achieved. Movement and song can develop children's kinesthetic intelligence through body movements such as bending the body while rotating the body, balancing the body by lifting one leg, moving the right hand and left-hand kinesthetic intelligence children's psychology. Psychomotor development of children aged 3-6 years, in gross motor skills, that is able to move the head, hands, and hands properly. Besides, subtle motor movements, which are fingers to grasp, squeeze, clench, arrange regular eye and hand movements.

Based on the author's direct observations in several churches and based on the results of the questionnaire, it was found that: (1) the learning method used by Sunday school teachers, in general, is the story method. Some teachers use the technique, but without teaching aids, (2) there is no class division based on age carried out at Sunday school, (3) in the learning process, children aged 3-6 years, unable to last long to hear teacher's explanation or story, and (4) when the teacher tells a story, early childhood actively moves, walks, runs, plays, and annoys his friend. Based on these observations, it is necessary to have a learning method for children aged 3-6 years (senses) that raises interest and attention so that it is easy to receive learning material.

At the stage of formulation of learning objectives intended to convert the material stated in the form of song and movement. Analysis of the learning objectives is to formulate learning objectives in cognitive and psychomotor development through song and movement.

Movement and song learning methods can be an alternative or preferred learning method that is often used (stories). Based on observations in several Sunday schools as described above, we need a guideline for teaching materials for the development of early childhood knowledge and movement through the method of song and movement. This is done in order to achieve learning objectives, namely material that is easy to understand, effective, and fun, as for the indicators of cognitive development, namely: (1) reciting song poetry, (2) memorizing song poetry, (3) Answering teacher questions at the re-calling stage. In addition, psychomotor development indicators used are: (1) the ability to move gross motor (hands, head, body, and legs), (2) the ability to move excellent motor skills, and (3) memorize song movements without assistance teacher.

Results of the Design Phase

At this stage the design results are obtained which include: (a) description of the preparation of instruments regarding the guidelines for teaching the method of song and movement in developing cognitive and psychomotor abilities of children, (b) description of the selected format for assessment of children's learning development, (c) initial design of the device learning the development of cognitive and psychomotor abilities through the method of song and movement. The intended song and movement method consist of: (1) learning specifications through movement and song in developing children's cognitive and psychomotor abilities, (2) learning instruments about developing cognitive, and psychomotor skills through the method of song and movement, and (3) guidance on teaching materials for methods of song and movement in developing cognitive and psychomotor abilities.

This product design phase is adjusted to the results of the previous needs analysis. The song and movement learning method developed is adapted to preschool children's age, namely the ages of 3 to 6 years, based on the existing curriculum, textbooks, and field observations. This adjustment is intended to get maximum results in learning so that it can improve the cognitive and psychomotor aspects of children.

Figure 1. Activity memorizing songs & movements

The Results of the Development Phase

This phase is the phase to determine the level of validity of the products developed by researchers. By knowing the validity level, researchers can take action on whether the product being developed needs to be improved or is suitable for use. The validated development products are teaching material guidelines, weekly activity plans, teacher activity sheets, learning implementation observation sheets, and children's activity sheets.

Validation test results

After the product is designed, the researcher submits the product prototype to two validators to be assessed and given input and suggestions.

Table 2. The results of the validation of the teaching material guidelines

Aspect of the teaching material guidelines	Ai (validator 1 & 2)	Category
Components of Teaching Materials	4	Very Valid
Teaching Material Format	3.6	Very Valid
Fill in Teaching Materials	3.2	Very Valid
Language and writing	3.8	Very Valid
Pictures and Songwriting	3.8	Very Valid
Benefits of Teaching Materials	3.1	Very Valid
Average	**3.6**	**Very Valid**

The results of the analysis from the above table can be explained that the average value of total evaluation and guidelines for teaching materials of movement and song methods for developing cognitive and psychomotor children aged 3-6 years, obtained x = 3.6. That is, the average value is in the range of 2.5 <X <3.5, which means it is categorized valid.

Table 3. Results of the validation of Weekly Activity Plans (WAP)

Aspect of Weekly Activity Plans	Ai (validator 1 & 2)	Category
Weekly Activity Plans (WAP)	3.8	Very Valid
Aim	4	Very Valid
Opening Activities	3.6	Very Valid
Core activities	3.6	Very Valid
Song and Movement	3.7	Very Valid
Time Allocation	4	Very Valid
Benefits of WAP	3.6	Very Valid
Average	**3.76**	**Very Valid**

Furthermore, the validation of the Weekly Activity Plan (WAP) is presented in table 3 above. Based on the table, aspects assessed in the form of weekly activity plans (WAP), learning objectives, opening activities, core activities, songs and movements, time allocation, and benefits of weekly activity plans, obtained an average of 3.6 results or are in the very valid category.

Table 4. Validation Results Teacher Activity Observation Sheet (TAOS)

Aspect of result TAOS	Ai (validator 1 & 2)	Category
Hint Aspect	3.3	Valid
Language Aspects	3.75	Very Valid
Content aspect	3.1	Valid
Average	**3.4**	**Valid**

In addition to the guidelines for teaching materials and WAP, another learning tool that is validated is the Teacher Activity Observation Sheet (TAOS). There are three aspects assessed by the validator on this TAOS, namely aspects of instructions, language, and text. The average value for the guidance aspect is 3.3, the language aspect is 3.75, and the content aspect is 3.1. Thus, the total average value of the TAOS validation results is 3.4. The TAOS is categorized as valid because it is in the range of $2.5 \leq X < 3.5$.

Table 5. Results of validation of Child Activity Observation Sheets (CAOS)

Aspect of CAOS	Ai (validator 1 & 2)	Category
Format	4	Very Valid
Language	3.6	Very Valid
Content	3.5	Very Valid
Average	**3.7**	**Very Valid**

The next learning tool that was validated was the Child Activity Observation Sheet (CAOS). This framework is used to assess children's activities in the learning process to see the development of cognitive and psychomotor aspects. There are three aspects assessed in this CAOS, namely aspects of format, language, and text. From the results of the evaluation of the validators, an average of 3.7 was obtained. This shows that CAOS has fulfilled validity criteria for use with a score of 3.7, which is in the range of $3.5 \leq X < 4$ or categorized as very valid.

Table 6. The results of the validation of the Learning Management Observation Sheet (LMOS)

Aspect of LMOS	Ai (validator 1 &2)	Category
Hint Aspect	3.1	Valid
Language Aspects	3.75	Valid
Content aspect	3.4	Valid
Average	**3.4**	**Valid**

In the validation of the Learning Management Observation Sheet (LMOS), the average value is 3.4. The score was obtained from the calculation of the mean score of the pointing aspect by 3.1, the language aspect by 3.75, and the content aspect by 3.4. This average value is categorized as valid because it is in the range of scores $2.5 \leq X < 3.5$ following predetermined criteria.

Table 7. The results of the teacher response questionnaire validation

Aspect of the teacher response questionnaire validation	Ai (validator 1 & 2)	Category
Hint Aspect	3.6	Very Valid
Language Aspects	3.8	Very Valid
Content aspect	3.6	Very Valid
Average	**3.6**	**Very Valid**

Another instrument validated by the validators is the teacher response questionnaire. The questionnaire is intended to capture teachers' perceptions and assessments towards the implementation of learning by the method of song & movement in improving the cognitive and motoric aspects of students. From the total of three aspects assessed in this questionnaire, a total average score of 3.6 was obtained. Thus, the teacher's questionnaire responses were categorized as very valid because the rating 3.6 was in the range of $3.5 \leq X < 4.0$.

Practicality test

The practicality test was carried out by observing the level of learning implementation by appointing eight teachers as observers in four Sunday schools, namely GKII Rhema, GKII Tamalanrea, GKII Talitakumi, and GKII Syalom Daya. There are several aspects assessed by observers in observing the level of practicality of learning tools, namely: (1) preliminaries, (2) core activities which include reciting song poetry, memorizing song lyrics, answering teacher questions, gross motoric movement, motoric movement subtle, and memorize song-poems independently, (3) closing, (4) time spent, and (5) class atmosphere.

Table 8. Analysis of TAOS Recapitulation Results from 4 Sunday Schools

Church's Name	Average	Category
Talitakum	3.4	Good
Syalom Daya	3.1	Good
Tamalanrea	3.45	Good
Rhema	3.2	Good
Average	**3.3**	**Good**

The average results of cognitive and psychomotor development on the Teacher Activity Observation Sheet (TAOS) are as follows: for the Talitakumi GKII church, the total average value is 3.4 in the excellent category; for the GKII Syalom Daya church, the average total score is 3.1 in the good category; for the GKII Tamalanrea church, the total mean value is 3.45, in the good category; for the GKII Rhema church, the total mean value is 3.2 in the good category. So, the average results of cognitive and psychomotor development on TAOS are in the "Good" category in the total average value of 3.3, which is in the range of 215 <M <3.5.

Table 9. LMOS recapitulation analysis results

Church	Average	Category
Talitakum	3.6	Good
Syalom Daya	3.1	Good
Tamalanrea	3	Good
Rhema	3.3	Good
Average	**3.25**	Good

The average calculation results on the Learning Management Observation Sheet (LMOS) are as follows: GKII Talitakumi 3.6 with the good category; GKII Syalom Daya 3.1 with the good category; GKII Tamalanrea 3 with the good category; GKII Rhema 3.3 with the good category. So the average total value (X) for LMOS is 3.25, meaning it is in the range of 2.5 ≤M <3.5.

Effectiveness Test

In conducting an effectiveness test, the researcher asks the observers to assess the level of learning accomplishment by observing student activities in class. The observer responds to student activities that he follows through the Child Activity Observation Sheet (CAOS). This test aims to determine whether there is an increase in cognitive and psychomotor aspects of students.

Table 10. Recapitulation of observations of learning practices (effectiveness test)

Church's Name	Average	Category
Talitakum	2.7	Good
Syalom Daya	2.9	Good
Tamalanrea	3.2	Good
Rhema	3.1	Good
Average	**2.97**	**Good**

Student Cognitive Development Test

Table 11. Cognitive test respondent data

Aspect	Equal variances assumed	Lavene's test for equality of variances		t-test for Equality of Mean		*t*(38)	Sig. (2-tailed)	95% Confident interval of the difference	
		F	Sig.	M	SD			Lower	Upper
Cognitive development	Equal variances not assumed	.460	.502	20.000	.29335	.682	.500	.39385	.79385

Based on the statistical test, the basis for the decision is: if the Sig. (2-tailed > 0.05, it can be stated that there is no difference/comparison between the variables studied. These variables are variables in children's cognitive aspects, such as saying song lyrics, memorizing song lyrics, and answering questions from the teacher. Sig. (2-tailed) <0.05, it means that there is a substantial difference/comparison between the variables in the cognitive aspect.

From the results of the parametric test, the Sig. (2-tailed) of 0.5, which means no significant difference/comparison between the variables in this cognitive aspect. Also, from the test results, it was obtained a significance interval value.

This indicated that there was a 95% difference in independence between -0.39385 to 0.79385. This suggests that there is an increase in the development of children's cognitive function.

Student Psychomotor Development Test

Table 12. Data on psychomotor test respondents

Aspect	Equal variances assumed	Lavene's test for equality of variances		t-test for Equality of Mean		*t*(38)	Sig. (2-tailed)	95% Confident interval of the difference	
		F	Sig.	M	SD			Lower	Upper
Psychomotor development	Equal variances not assumed	.187	.668	55.000	.30240	1.819	.077	.06218	1.16218

Similar to testing on the cognitive aspects, statistical tests to measure psychomotor aspects' improvement also have the same basis. If the value is Sig. (2-tailed) > 0.05, it is stated that there is no significant difference/comparison between the variables in these aspects of psychomotor measurements, such as moving gross motor skills, working on children's activity sheets (fine motor skills), and memorizing song movements correctly. Conversely, if Sig. (2-tailed) <0.05, it can be concluded that there is a significant difference/comparison between the psychomotor variables studied. Based on the parametric test, the Sig. (2-tailed) of 0.07 indicates no significant difference/comparison between the variables examined in the psychomotor aspects of children. Also, the significance interval value suggests that the region has a 95% difference in independence is between -0.06218 to 1.16218. This value interval states that there is an increase in the development of psychomotor functions in children.

Discussion

Based on the results of a needs analysis conducted by observing learning and questionnaires to Sunday school teachers, it was found that the majority of teachers still mostly use the storytelling method in teaching. Storytelling techniques that are done traditionally and with digital learning can develop communication skills, collaboration, and strengthen children's literacy practices (O'Byrne et al., 2018). In addition, storytelling can also increase learning motivation (Lee, 2012) and children's language skills and language abilities (Mokhtar et al., 2011).

In addition to some of the advantages mentioned above, the storytelling strategy also has shortcomings. Based on observations and questionnaires for teachers, there are several obstacles faced with this strategy. Some of these obstacles include: (1) the emergence of boredom and drowsiness for children when this strategy is implemented, (2) children actually actively move when the teacher is telling stories, and (3) their attention quickly disappears if the storytelling strategy is carried out every day.

The results of the validation test on the learning device with movement and song show that the products are valid. A product or instrument is declared valid if the product measures what it should measure (Mujis, 2011). The validity level of this teaching material is determined by calculating the total average value of each product. Each product is declared valid if the average value is in the range of $2.5 \leq X < 3.5$, while the highly valid level is in the range of $3.5 \leq X < 4.0$ (Ahmar & Rahman, 2017).

The next test in this study is the practicality test, which aims to see the practicality of the product aimed at teachers as users. Practicality test results using TAOS and LMOS observation sheets are included in both categories, with an average value of 3.3 and 3.25. This practicability test assessed several aspects, including (1) introduction, (2) core activities that included the operation of reciting song poetry, memorizing song lyrics, answering teacher questions, gross motor movements, subtle motor movements, and memorizing song-poems in a manner independent, (3) closing, (4) time spent, and (5) class atmosphere. In general, the practicality test focuses on several issues, namely: (1) are teaching materials easy to use? and (4) are the teaching materials consistent with efforts to improve students' cognitive and psychomotor aspects? (Abualrob & Shah, 2012).

Finally, in creating the right teaching materials, it is necessary to test the effectiveness by using students as research subjects. The effectiveness test results showed that this study's product was well categorized with an average value of 2.95. In other words, teaching materials with the method of song and movement proved to be effective in improving the cognitive and psychomotor aspects of students.

The song & movement method is considered to have advantages in stimulating and developing cognitive and psychomotor aspects of children. Various studies have confirmed this statement. Chandler and Tricot (2015) emphasized that there is a relationship between the brain and the body and how the learning process with body movements is very closely related. Furthermore, they both also concluded that there is a positive correlation between

gestures (subtle movements) on cognition and learning. In other words, movements that are focused on the song & movement learning method play an important role in the cognitive and psychomotor aspects of children.

More broadly, the song & movement method also has a substantive positive effect on children's cognition, memory, mental processing skills, learning, and academic achievement (Erickson et al., 2015; Tomporowski et al., 2008). In fact, Walton (2014) claims that this method teaches literacy skills to help facilitate long-term memory processes to support children's reading tasks. Thus, the song & movement method has great potential in encouraging various aspects of child development.

Conclusion

The most important aspects of children's development are cognitive and psychomotor aspects. For this reason, teachers need to innovate by designing and developing learning methods to improve both aspects. Research is a research development by adopting the 4D theory of Thiagarajan et al. (1974) through four phases: defining, designing, developing, and disseminating phases. The product produced in this study is a method of learning through movement and song to improve students' cognitive and psychomotor aspects.

Based on the validity, practicality, and feasibility test, this learning method is proven to improve students' cognitive and psychomotor aspects through song & movement. Validity test is carried out by two experts who give an assessment in the category of "valid" while the practicality test is done by observing the activities of the teacher in the learning process in class. Finally, a test of the feasibility of learning or a test of effectiveness is carried out to see the learning method's effectiveness by observing the child's activities during the learning process. The development of this learning method is expected to provide choices for Sunday school teachers in managing their learning to improve the cognitive and psychomotor aspects of children.

Suggestions

Along with the times, teachers must be able to make various innovations and breakthroughs to provide extra services for children's learning. One way that can be taken is by conducting research and development to create learning products with novelty value. This research aims to develop learning products using songs & movement strategies to improve children's cognitive and psychomotor aspects. For future research, it is also necessary to develop similar learning products that cover other aspects of child development, namely affective elements.

Based on the results of this study, researchers recommend kindergarten and Sunday school teachers to design and develop learning products, especially by integrating the song & movement method into them. Teachers can also apply this method in the learning process by inviting children to sing and make movements according to their needs to improve their cognitive and psychomotor aspects. The movements and songs chosen should have simple lyrics and movements appropriate for their age level between 3-6 years.

Limitations

Although this research field trial was conducted on four Sunday schools in Makassar City (Indonesia), it is also essential to consider more various research subjects. For further studies can be done using research subjects from schools with different backgrounds. For example, field trials can also be done in kindergartens in general and are not specific to Sunday school.

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Conflict of Interest

The authors declare no conflict of interest.

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Appendix 1

The validation of teaching material guidelines

1) Assessment by reviewing several aspects, general inspection, and suggestions for revising the assessment instrument to validate teaching material guidelines that have been prepared.

2) Assessment by reviewing the suitability of the statement items and the observed aspects/indicators by giving a checklist (v) on the available value column using the following scale:

1. Irrelevant

2. Less Relevant

3. Relevant

4. Highly Relevant

No	Assessment Aspects	Assessment			
		1	2	3	4
1	Instructional Material Components a. Learning objectives b. Time Allocation c. Material (Introduction, Core Activity, and Closing) d. Children's Activities				
2	Teaching Material Format a. Clarity of distribution of activities b. Numbering c. Interesting d. The subject matter is accompanied by children's activities e. Font type and size f. Room arrangement g. Suitability of the size of the teaching material manual				
3	Content of Teaching Materials a. The program's suitability outlines the motion learning method and songs for cognitive development, namely mentioning/pronouncing, repeating, grouping, and memorizing. b. The suitability of the program outline for the method of learning motion and songs to children's psychomotor development, namely moving limbs, kneeling, walking, jumping (gross motor skills) and coloring, sticking, cutting (fine motor skills) c. The suitability of the principles of the method of learning motion and songs to cognitive development, namely, developing children's knowledge and psychomotor, namely behavior/movement. d. The truth of the concept/Material e. The regularity of the use of the term.				
4	Language and Writing a. The language used is simple, and according to the child's level of understanding b. Using excellent and correct Indonesian. c. Use precise and easy to understand terms				
5	Image and Song Writing a. Teaching materials are accompanied by the lyrics of each song to be taught b. The song material is accompanied by numerical notes making it easier for the teacher to teach the song c. Instructional Material Guidelines accompanied by an explanation of the pictures of the movements that will be carried out following the song				
6	Benefits of Teaching Materials a. It can be used as an optional Sunday school teacher manual in teaching sensory classes. b. Helping teachers to teach by using a wide selection of teaching methods c. Develop the teacher's talent for composing songs to teach God's Word				

Appendix 2

The validation of Weekly Activity Plans (WAP)

1) Assessment by reviewing several aspects, general inspection, and suggestions for revising the assessment instrument to validate teaching material guidelines that have been prepared.

2) Assessment by reviewing the suitability of the statement items and the observed aspects/indicators by giving a checklist (v) on the available value column using the following scale:

1. Irrelevant

2. Less Relevant

3. Relevant

4. Highly Relevant

No	Assessment Aspects	Assessment			
		1	2	3	4
1	Weekly Activity Plan Format. a. Clarity of Material Distribution (Introduction, Core Activity, Closing) b. Numbering c. Type Font/writing sized. Room Arrangement				
2	Aim a. Clarity of objectives and time spent. b. Clarity of time allocation				
3	Opening Activities a. Habitual activities are formulated and implemented by the teacher. b. Teachers need materials as teaching materials. c. The steps taken in the preamble are spelled out. d. Appropriateness of the allocated time.				
4	Core activities a. The aspects of the cognitive indicators, namely pronouncing song lyrics, memorizing song lyrics, and answering questions carried out at the recalling stage, are described clearly. b. Psychomotor indicator aspects are gross motoric movement, fine motoric movement, memorizing, movements, and songs without teacher assistance. c. The suitability of children's activities with the material in teaching materials. d. Development of fine motoric movements of children through children's activities e. Repetition of movements and songs performed. f. The steps of the activity are carried out clearly.				
5	Songs and movements a. The suitability of song lyrics (short) with the level of understanding the ability of sensory children. b. Compatibility of song lyrics with children's simple language skills. c. The movement's suitability with the child's gross motor skills, namely the movement of the head, hands to the side, upward, clapping, crossing and walking, and jumping. d. The suitability of movement with the child's fine motor skills is using coloring fingers, coordinating fingers holding colored pencils, sticking, kneeling feet. e. Songs and movements stimulate the child to move.				
6	Time Allocation a. By the subject matter b. Determined according to the activities that the child must do at each meeting.				
7	Weekly Activity Plan Benefits a. Can be used as a guide for teachers as a Daily Activity Plan (DAP) b. Increase the activity of children in a class, not an active teacher. c. Learning is more directed to achieve goals.				

Appendix 3

The validation of Teacher Activity Observation Sheet (TAOS)

1) Assessment by reviewing several aspects, general inspection, and suggestions for revising the assessment instrument to validate teaching material guidelines that have been prepared.

2) Assessment by reviewing the suitability of the statement items and the observed aspects/indicators by giving a checklist (v) on the available value column using the following scale:

1. Irrelevant

2. Less Relevant

3. Relevant

4. Highly Relevant

No	Assessment Aspects	Assessment			
		1	2	3	4
1	Aspect Instructions a. Instructions for the teacher's activity sheet use the motion learning method, and the song is written clearly. b. Teacher activity observation sheets are arranged systematically (introduction, core activity, cover) c. The teacher activity criteria are clearly stated, step by step.				
2	Aspects of Language a. The use of the language used is Indonesian, which is excellent and correct. b. Clarity of instructions on problem-solving c. The simplicity of sentence structure. d. The language used is communicative.				
3	Content aspect a. The purpose of using the teacher's observation sheet is formulated and measured. b. The observed aspects included teacher indicator stages (facilitator, mediator, motivator, evaluator) using song and movement methods. c. Each assessment on the observation sheet uses words/statements/commands that require assignment.				

Appendix 4

The validation of Child Activity Observation Sheets (CAOS)

1) Assessment by reviewing several aspects, general inspection, and suggestions for revising the assessment instrument to validate teaching material guidelines that have been prepared.

2) Assessment by reviewing the suitability of the statement items and the observed aspects/indicators by giving a checklist (v) on the available value column using the following scale:

1. Irrelevant

2. Less Relevant

3. Relevant

4. Highly Relevant

No	Assessment Aspects	Assessment			
		1	2	3	4
1	Aspect Instructions a. Instructions on the teacher's ability observation sheet are clearly stated. b. The observation sheet is easy to implement c. The observed criteria are clearly stated				
2	Aspects of Language a. The use of the language used is good and correct language. b. Clarity of troubleshooting instructions c. The simplicity of sentence structured. The language used is communicative				
3	Content aspect a. The observed categories of students' activities included cognitive aspects, namely saying song lyrics, memorizing song lyrics, answering questions on the Children's Worksheet. b. The observed categories of students' activities included psychomotor aspects, namely moving gross motor skills, moving fine motor skills, and memorizing movements with songs independently. c. The categories of students' activities can be adequately observed. d. The suitability of the sequence of activities and subject matter is clearly stated.				

Appendix 5

The validation of the Learning Management Observation Sheet (LMOS)

1) Assessment by reviewing several aspects, general inspection, and suggestions for revising the assessment instrument to validate teaching material guidelines that have been prepared.

2) Assessment by reviewing the suitability of the statement items and the observed aspects/indicators by giving a checklist (v) on the available value column using the following scale:

1. Irrelevant

2. Less Relevant

3. Relevant

4. Highly Relevant

No	Assessment Aspects	Assessment			
		1	2	3	4
1	Aspect Instructions a. Instructions on the teacher's ability observation sheet are clearly stated. b. The observation sheet is easy to implement c. The observed criteria are clearly stated				
2	Aspects of Language a. The use of the language used is Indonesian, which is good and correct. b. Clarity of troubleshooting instructions c. The simplicity of sentence structured d. The language used is communicative.				
3	Content aspect a. The purpose of using the observation sheet on the teacher's ability to manage to learn is formulated. b. The observed aspects included the stages and indicators of the teacher's ability to manage learning c. Observation of the teacher's ability to manage to learn using words/statements/commands that demand value.				

Appendix 6

The teacher response questionnaire validation

1) Assessment by reviewing several aspects, general inspection, and suggestions for revising the assessment instrument to validate teaching material guidelines that have been prepared.

2) Assessment by reviewing the suitability of the statement items and the observed aspects/indicators by giving a checklist (v) on the available value column using the following scale:

1. Irrelevant

2. Less Relevant

3. Relevant

4. Highly Relevant

No	Assessment Aspects	Assessment			
		1	2	3	4
1	Aspect of Instructions a. Clarity Instructions for the questionnaire sheet on teacher responses to children's cognitive and psychomotor development through movement and song methods. b. The observed criteria are clearly stated.				
2	Aspects that were responded to Assessment of learning tools as follows: a. Instructional Material Guidelines b. Weekly Activity Plan (WAP) c. Children's Activity Observation Sheet (TAOS)				
3	Aspects of Language a. Use good and correct Indonesian. b. Formulation of communicative questions c. Use sentences that are easy to understand				