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Content validity of gymnastics through movement and song programmes and its impacts on kindergarten students' balance

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ABSTRACT

Background: Gymnastics learning is considered an exercise programme that is aimed at improving the balance movement skills of kindergarten students. There is a limited gymnastic program to develop the kindergarten students' balance and movement skills that meet the students' needs and wants. **Research Objectives:** The purpose of this study is to determine the feasibility of gymnastics learning activities on the ability to move balance for kindergarten students. **Methods:** This research is an R&D, a movement and song gymnastics program for the kindergarten students' balance. The participants involve 30 students aged 5-6 years. The validators were five experts focusing on the topic addressed. The first stage examines qualitatively articles, e-books, textbooks, and programme design. The second stage applies the Aiken's V technique to assess the training program. The third stage analyses the assessment results. The fourth stage tests the training programme. **Findings and Results:** Based on the results of Aiken V's analysis related to the movement and song gymnastics program developed, the overall score shows a range of 0.8 to 1.00. The programme is feasible and valid as a balance movement learning in kindergarten. **Conclusion:** The movement and song practice programs that have been prepared have good and valid content validity. The novelty of this study is to develop a gymnastics program integrated with the educational curriculum for kindergarten children. This includes designing activities taking into account the differences in each child's level of balance, strength, and motor skills. The programme will be applied to students to know the effectiveness of the movement and song training program for gymnastics on the balance ability of kindergarten students.

Keywords: Content validity; movement and song exercises; balance; gymnastics; kindergarten students

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INTRODUCTION

The early child learning characteristics can influence the child's future outcomes in a very valuable way. The characteristics of children in the early years determine the child's body development into a healthy person (Akdeniz, 2016; Jones et al., 2015; Barnett et al., 2016a). Children need to access more opportunities to express

themselves to be creative and explore the best sources within themselves with the helps of adults. It is, then, assumed that teachers who are more supportive in interacting with children provide a good stimulus for children's development can stimulate the class through interactions with children. This condition makes children more proactive (Broekhuizen et al., 2016; Laukkanen et al., 2014; Barnett et al., 2016b; Bautista et al., 2016; Bulca et al., 2020). Bjorgen (2016) states that children at the age of 3 to 5 years are required to play together physically with the supports from their parents. This can initially represent the child's potential.

Gross motor development is defined as the development of physical movement control through the coordinated activity of nerve centers, nerves and muscles (Susiono et al., 2024). Movement skills in sports are very good for children since it can overcome obesity in childhood and adolescence (Liong et al., 2015). A number of locomotor skills such as walking, running, jumping and sliding are very important skills and structuring exercises to keep them fun allows children to enjoy movement for play (Susiono et al., 2024). Engaging in activities that require a range of locomotor skills, such as walking, running, jumping, and sliding, is essential for children's physical and mental well-being. These skills not only support overall physical fitness but also enhance balance, coordination, and spatial awareness. Structuring exercises to keep them enjoyable allows children to embrace movement as play, fostering a lifelong appreciation for physical activity. Additionally, these gross motor activities contribute to social development, as children learn teamwork, patience, and perseverance through group play and sports.

Gymnastics is a physical activity that is practiced on the floor or with equipment to improve body control, strength, flexibility, agility, endurance, and coordination worldwide (Pradipta et al., 2022). Children who participate in gymnastics, which teaches combining continuous motions to increase the complexity of motions incorporated into rhythm, benefit from the programme (Quin, 2016). Coordination, flexibility, agility, muscle strength and endurance, and bone strength are all enhanced by gymnastics. Furthermore, gymnastics promotes discipline, focus, and perseverance as children practice and refine their skills over time. A successful introduction to increasingly sophisticated gymnastics techniques relies on mastering fundamental artistic gymnastics skills, which can lead to advancements in essential movement abilities. A successful introduction to increasingly sophisticated gymnastics requires the mastery of fundamental artistic gymnastics skills, which can spur advances in fundamental movement abilities (Cerovac & Keane, 2014).

Gymnastics that combines song and movement, namely those songs specifically designed for young children (Pradipta et al., 2023). According to Kiper et al. (2024), in order for teachers to effectively instruct gymnastics skills, they must possess both pedagogical skills—the ability to engage with students—and knowledge of teaching gymnastics. Knowledge and cognitive understanding require physical activity as a crucial component (Ahun et al., 2024). Children will be able to move in a variety of ways and learn how to move through creative movement (Iivonen & Sääkslahti, 2014). Children who start gymnastics will be able to develop their mental and physical skills, and their school health will improve if they have the bravery to demonstrate the motions in the rhythm of gymnastics (Albertin et al., 2018). Gymnastics helps enhance the following skills: 1) Agility: In gymnastics, kids can alter the speed or direction at which they turn their bodies, as well as how they walk. 2) Balance: A strong degree of both symmetrical and asymmetrical balance is necessary for several gymnastics movements. 3) Coordination: utilising bodily parts in various ways and walking in various ways around the body and in space (Loprinzi et al., 2015).

This study introduces several new things that distinguish it from previous research, including aspects of methods, analysis, instruments, and research subjects. This study presents innovations in terms of methods, analysis, instruments, and subject characteristics that make it different from previous studies. Unlike the experimental quantitative approach by (Ahun et al., 2024), which focused on the balance of 11-12-year-olds, this study adopts a mixed-methods approach by combining quantitative and qualitative techniques to collect more in-depth and integrated data. This allows for cross-validation, which increases the accuracy of the results. In addition, while Cerovac and Keane (2024) used a paired t-test for analysis, this study applied a new analytic model with machine learning, validated using Aiken's V, which is able to identify more complex data patterns. This study developed a new instrument to measure balance, which is more sensitive and accurate than Quin (2016)'s Stork Stand Test. This study's use of 5-6 year old subjects allows for more specific results in that age range, providing richer insights into early balance development and practical field recommendations.

The importance and purpose of the research lie in its ability to provide deeper insights into the use of more innovative methods, analyses, and instruments and engage subjects with age-specific requirements in early childhood. The study's results can enhance comprehension of the studied phenomenon, pinpoint previously unobserved factors, and provide more precise and practical suggestions. The objective is to test the content validity of gymnastics through movement and song programs developed and measure the effectiveness.

METHOD

Participants and Study Design

Development research used in research. Development research is a research method to produce educational products, both products in the form of material objects such as textbooks, and teaching films (Logan et al., 2018). Products in the form of processes and procedures found such as teaching methods or methods of organising teaching (Pradipta et al., 2023). This study has four stages, the first stage is the researcher reviewing documents in the form of articles, and relevant ebooks to design the training programme, the second stage applies Aiken's V technique to the validation process of the prepared training programme, the researcher involves five experts to validate the training programme. The third stage is to analyse the results of the assessment from five experts by applying the content validity ratio (CVR) formula, after the programme can be said to have good and valid content validity, the fourth stage is to implement a movement and song programme to improve balance movement skills in kindergarten students.

Procedure

The kindergarten school field is where the training programme is being implemented. The equipment used in this study were a cone, a timer, and a whistle for signaling. Prior to engaging in a fitness regimen, pupils need to be in excellent health. The teacher delivers directions and models balance movements that will be utilised to score the balance test as part of the first step of the process. To facilitate students' ability to follow the movement exercises and songs, pupils are arranged in line with a certain distance between each other in the second stage. Table 1 displays the sequence of training programmes that have been designed.

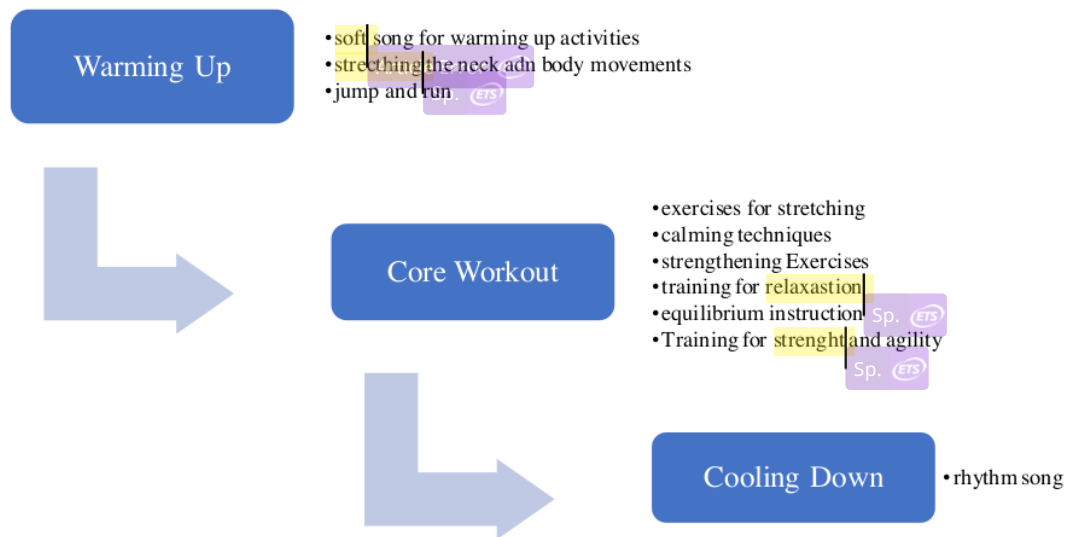
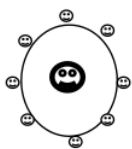

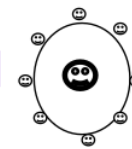
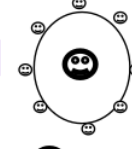
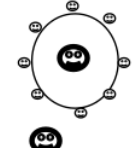
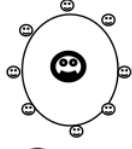


Figure 1 Syntax of Movement and Song Training Programme for Gymnastics

Table 1. Movement and Song Training Programme for Gymnastics

Narrative	Gymnastic movement	Actions	Formation
<p>Warming Up Song: 1. Potong Bebek Angsa 2. Naik Delman</p>	<ul style="list-style-type: none"> Students run to the beat of the song Students push left Students push right Students move their bodies to the right and left with their hands above Students run slowly in place as if they were riding a horse Students make jumps Students run in place and end with a forward jump 	<p>Warming up activities</p>	
<p>Core workout: Theme of the story: A farmer who fears snakes</p>	<p>Stretching the neck: (head upward, downward, to the Left and right)</p>	<p>Walking and running activities, body exercises, balance training, strength and agility training, and jumping and jumping exercises are the five categories into which the core exercises are divided.</p>	
<p>B.1.1 Exercises for stretching Before he leaves for his daily trip to the rice fields in the morning, Mr. Tono notices birds outside his home. When Mr. Tono was satisfied with his bird watching, he got ready to take the hoe out to the fields. Mr. Tono brought the hoe after first relaxing his hands. In order to feel powerful and invigorated for his trek from his residence to the rice fields, Mr. Tono bends first.</p>	<p>Hand stretches:</p> <ul style="list-style-type: none"> Hands forward with palms bent down and up Left hand bent to the right Stretching by twisting the body to the right, left, and down Rotate the hands back and forth like imitating a windmill movement Shake the hips to the right, left, forwards, and backwards Students mimic the hoeing movement 	<p>Body training is specifically broken down into four types of exercises: body stretching, body weakening, body strengthening, and body releasing. Exercises B.1.1 through B.1.4 are included in the body exercises category.</p>	
<p>B.1.2. Calming techniques Mr. Tono spotted a windmill spinning in the wind while traveling. Continuing the narrative: A farmer who is terrified of snakes Mr. Tono proceeded towards the rice. Satisfied with the windmills, Mr. Tono proceeded towards the rice fields. As Mr. Tono approached the rice fields, he saw a farmer guiding ducks toward food. The ducks pass by, wriggling their bums.</p>	<ul style="list-style-type: none"> Students do the movement to plant corn Students move their hands above and then drop them down by bowing The body bowed and then moves the hands toward the inside of the body 		
<p>B.1.3. Strengthening Exercises When Mr. Tono got to the fields, he started hoeing them right away so that corn could be planted. Mr. Tono finished hoeing and immediately planted maize. Overlooking Mr. Tono's rice field are corn plants.</p>			
<p>B.1.4: Training for relaxation After a hard day of hoeing and planting maize, Mr. Tono was worn out. Then, in an attempt to shake off his fatigue, he raised and lowered his hands. In an attempt to ease his pains, Mr. Tono bent over and moved his hands.</p>			
<p>B.2. Equilibrium instruction It was getting late in the afternoon, so Mr. Tono hurried home from the fields. Mr. Tono observed a crane en route. Mr. Tono saw the leg of a crane rise. After watching the cranes for a while, he saw an airplane flying low.</p>	<ul style="list-style-type: none"> Students raise both hands and bend one leg, then straighten the bowed leg, repeating the process with the other leg. Extend your arms by bending your torso and raising one leg straight back, then elevating the other leg in turn. 	<p>(2) Exercises for balance,</p>	
<p>B.3. Training for strength and agility Mr. Tono carried on with his journey. On the way, Mr. Tono went by Mr. Haji Toyib's mango garden. With Mr. Toyib's approval, Mr. Tono started tiptoeing around picking mangoes. Occasionally, Mr. Tono might toss the selected mangoes to the ground. Some mangoes were out of reach for Mr. Tono to reach with his tiptoes, so he had to hop up and down to get them. Mr. Tono found that many of the mangoes had fallen when he was able to pick them up since they were tall enough. Then Mr. Tono bent down to pick up dropping mangoes.</p>	<ul style="list-style-type: none"> Beginning with standing, the movement progresses to tiptoeing, squatting, standing straight, and standing on tiptoe. Leaping with a frog-like gait—bending legs, refusing to move, and putting hands in front of the face 	<p>(3) Training for strength and agility</p>	

Narrative	Gymnastic movement	Actions	Formation
<p>B.4. Jog or walk When Mr. Tono had eaten all of his mangoes, he resumed his walk home. Unintentionally, Mr. Tono saw a snake sleeping. Mr. Tono, who was afraid of snakes, stepped as widely as he could while remaining on tiptoe to prevent rousing the snake. Mr. Tono made an effort to dodge the snake by stepping backward and sideways. Mr. Tono passed the snake and then carefully ran away from it. Mr. Tono immediately accelerated after a brief distance.</p>	<ul style="list-style-type: none"> Step in a squat while adhering to the Way's formation: Walk on tiptoe Wide step path Step forward and backward; step left and right in a sideways manner. Run: Move slowly in position Run around the structure 	(4) Running and walking routines	
<p>B.5. Exercises involving jumping (on one and two legs) The road is still broken, with multiple potholes in the middle, and the route to the house is still somewhat lengthy. Mr. Tono leaped over the road's pothole. Mr. Tono does more than just leap; in order to go over the gaps in the road fast, he also jumps with one foot. After facing numerous challenges along the road, Mr. Tono made it home without incident.</p>	<ul style="list-style-type: none"> Jump: Leap ahead Leap like a kangaroo Hop: One-leg (tiptoe) jumping carried out with alternate legs 	(5) Leaping and leaping drills	
<p>Cooling down Rhythm song 3/4 Naik-naik ke puncak gunung</p>	<ul style="list-style-type: none"> Raise the hands till they come back to the sides of the body, then raise the tiptoes until they touch the ground once more. Deep breathing occurs while the hands are raised, and mouth exhalation occurs when the hands descend to the sides of the body. With both hands up, the right foot in front, and the left foot back on tiptoe, slant your body to the right. Both hands bent on the right leg's thigh, left leg bent, right leg straight sideways. Bend leftward, raise both hands, place left foot forward, and tiptoe back with right foot. Both hands bent on the left leg's thigh, right leg bent, and left leg straight sideways. 	Cooling down activities	

Information:



- : Teacher
- : Student
- : Circular Marching Formation

Statistical Analysis

To find proof of the measuring instrument's content validity, researchers employed Aiken's V content validity coefficient technique. The content validity coefficient is based on the findings of an expert assessment of n people on an item regarding the degree to which the item represents the construct being measured. Hendryadi (2017) developed the Aiken's V formula, which is as follows: $s/[n(C-1)] = V$. According to Hendryadi (2017), if the content validity coefficient goes from 0.00 to 1.00, the item is deemed legitimate. The following is the formula that Aiken's V suggests $s = r - lo$, where r is the supplied number, c is the greatest validity assessment number (which is 4), and r = the number given by the expert judgment. In this measurement the author uses the help of an Excel formula.

RESULTS AND DISCUSSION

The researcher used Aiken's V content validity coefficient technique to find the proof of the validity of the content of the measuring instrument. Hendryadi (2017) formulated Aiken's V formula to calculate the content validity coefficient based on the results of an assessment from five expert judges on an item in terms of the extent to which the item represents the measured construct. Hendryadi (2017) stated that an item is declared

valid if the content validity coefficient moves from 0.00 to 1.00. The training programme can be deemed to have good validity based on the findings of calculations made using the Aiken's V formula; all items received a value of 1.00, confirming the opinions of five material experts who validated it. Stated differently, the five material specialists who provided validation said that the devised movement and song exercise training programme was crucial. As a result, the curriculum can be deemed legitimate and offered to kindergarten kids as a training tool. Table 2 displays the expert validation results for the following.

Table 2. Results of material expert assessment using Aiken's V analysis

Question	Assessment					S = r - lo					Σ	N*(C-1)	v= s/(N*(C-1))	Information
	1	2	3	4	5	1	2	3	4	5				
1	4	3	4	4	4	3	2	3	3	3	14	15	0.91	Valid
2	4	3	3	4	3	3	2	2	3	2	12	15	0.81	Valid
3	3	4	3	2	3	4	4	4	3	3	14	15	0.91	Valid
4	3	4	3	3	3	3	2	4	4	4	14	15	0.91	Valid
5	3	4	3	3	3	3	2	4	4	4	14	15	0.91	Valid
6	3	4	3	3	3	3	2	2	4	4	13	15	0.88	Valid
7	4	2	3	3	3	2	2	4	4	4	13	15	0.88	Valid
8	2	3	3	3	3	2	2	4	4	4	13	15	0.81	Valid
9	2	4	3	3	3	2	2	4	4	4	13	15	0.88	Valid
10	3	3	3	3	3	3	4	4	4	4	15	15	1.00	Valid
11	3	3	3	3	3	4	4	4	4	4	15	15	1.00	Valid
12	3	3	3	3	3	4	4	4	4	4	15	15	1.00	Valid
13	3	3	3	3	3	4	4	4	4	4	15	15	1.00	Valid
14	4	3	3	4	3	3	2	2	2	3	12	15	0.8	Valid
15	3	4	3	3	3	2	3	2	4	4	13	15	0.88	Valid
16	3	3	3	4	3	4	3	4	4	4	15	15	1.00	Valid
17	4	3	3	3	3	4	4	4	4	3	15	15	1.00	Valid
18	4	2	3	3	3	2	4	4	2	4	13	15	0.88	Valid
19	3	3	4	3	3	4	4	3	4	4	15	15	1.00	Valid

According to the Aikens' V formula results of the content validity test, the five experts' assessment items had a score between 0.87 and 1.00. Thus, it may be said that the programme's design has strong content validity. Many academic works have confirmed that the ratio value with an indicator score is either close to or -1 to 1, indicating that its validity is strong (Luzzeri & Chow, 2020; Stanger et al., 2020; Cooke et al., 2014). A higher value for the content validity ratio indicates stronger essentiality or high content validity (Widodo et al., 2022). Achieving high content validity is crucial, as it ensures that the program effectively meets the expectations and standards within the field. This, in turn, contributes to the reliability of the program outcomes, as strong content validity minimises the risk of misinterpretations and enhances the credibility of the results. Furthermore, high content validity is often a precursor to higher construct validity, which suggests that the programme can be confidently used in related research or practical applications.

Erdvik et al. (2020) Aiken V is used to measure the validity of content, especially in the development of research instruments such as questionnaires or tests, which can produce accurate data (Liu, 2024). The value of the Aiken index indicates the rater's agreement regarding the suitability of an item with the indicator to be measured. Based on the table above, the results of the assessment of material experts on the questionnaire items given to material experts, the analysis using Aiken's V method can be explained as follows: (1) The gymnastics-based movement learning model in accordance with the basic competencies gets a score of V = 0.91, (2) The gymnastics-based movement learning model in accordance with the order in compiling gymnastics gets a score of V = 0.81, (3) The content of the gymnastics-based movement learning model in accordance with the characteristics of kindergarten students gets score V = 0.91, (4) The gymnastic-based movement learning model gets a score of V = 0.91, (5) The tool used cheaply gets a score of V = 0.91, (6) The fun gymnastics-based movement learning model gets a score of V = 0.88, (7) The tools used practically get a score of V = 0.88, (8) The gymnastic-based movement learning model is easy to do get a score of V = 0.81, (9) The gymnastics-based movement learning model invites children to express various body movements get

a score of $V = 0.88$, (10) The gymnastics-based motion learning model for training the motor physique of kindergarten children gets a score of $V = 1$, (11) The gymnastics-based motion learning model for locomotive movement of students gets a score of $V = 1$, (12) The gymnastics-based motion learning model for training non-locomotor movements of students gets a score of $V = 1$, (13) The gymnastics-based motion learning model for manipulative movements for students gets a score of $V = 1$, (14) The dynamic learning model based on varied gymnastics got a score of $V = 0.8$, (15) The innovative gymnastics-based motion learning model got a score of $V = 0.87$, (16) The gymnastics-based motion learning model was effective in training the motor physique of kindergarten students got a score of $V = 1$, (17) Gymnastics invited children to perform varied movements with agility got a score of $V = 1$, (18) The gymnastics-based motion learning model optimised the motor physique of kindergarten students got a score of $V = 0.88$, (19) Children are able to perform body movements in a coordinated manner, flexibility and balance get a score of $V = 1$. Hendryadi (2017) explained that the value of Aiken's V coefficient ranges from 0 to 1. Based on the results of Aiken's analysis related to the model developed, the overall value shows a range of 0.8 to 1.00, so it can be said that the model that has been prepared is feasible and valid. This is by a literature review that Aiken's score of 0.8 to 1.00 shows that the agreement between the panelists can be said to be high. Susanto et al. (2024) Stated proper and trustworthy data validity is essential for making informed decisions and preventing mistakes.

Based on the results of the study, it can be discussed in this study, namely that the gymnastics learning media through movement and song programmes on improving student balance has a very high validity level value. Gaddi et al. (2024) The gymnastics programme is very effective in training students' balance. Research findings on the development of gymnastics learning media through movement and song programmes on improving students' balance corroborate the findings Alim et al. (2023) and Susiono et al. (2024) which states that the V coefficient above 0.760 indicates adequate content validity. In other words, the design of gymnastics learning media through movement and song programmes to improve students' balance has been supported by ten academic and professional experts. Their ranking shows that the gymnastics learning media through movement and song programmes to improve the balance of the students has a high content validity. Experts support gymnastics learning media through movement and song programmes, the latter of which is a learning medium to improve student balance.

Seeing the results of the analysis, the model developed can be used by teachers in learning movement and songs to improve the balance of movement in kindergarten students. Pradipta et al. (2022) stated that the movement and song gymnastics training program is feasible to be used to improve the balance movement skills of kindergarten students. Students participating in movement and song gymnastics in kindergarten is an effective way to train students' locomotor, non-locomotor, and manipulative skills. Students participate in gymnastics to move to the rhythm of the song and the form of the story in the movement (Erdvik et al., 2020). Students learn through observation, role models, and influences from the social environment around them. Learning has an impact of change, learning according to the characteristics of students and done in a fun way will provide changes to the basic movement skills of kindergarten students (Wasenius et al., 2018). Eriani and Dimiyati (2020) revealed that movement gymnastics and song are learning media that are by the characteristics of kindergarten students.

Kindergarten kids are trained in gymnastics as a movement learning paradigm, which influences their development of motor skills. Kindergarten pupils are subject to altering effects from learning, which are not just the result of aging or biological changes but also result in long-term changes in ability (Illeris, 2016). Engaging kindergarten pupils in gymnastics movement and song is a useful method for honing their locomotor, non-locomotor, and manipulative skills. Pupils create a moving narrative by moving to the beat of the song and mimicking gymnastics movements (Masrun et al., 2023). Pradipta et al. (2022) The findings of the gymnastics movement and song effectiveness test demonstrate that kindergarten pupils' basic motor abilities are improved by the repetitive movements performed during the lessons.

Pradipta et al. (2023) stated kindergarten pupils benefit from gymnastics movement and song as a teaching tool because it helps them develop their fundamental motor abilities. Pupils pick up knowledge through social environment influence, observation, and role models. Learning has a transforming effect; kindergarten pupils' basic motor skills will alter as a result of learning tailored to their individual needs and presented in an

engaging manner (Satria et al., 2020). Van Art et al. (2017) Kindergarten pupils' basic movement skills are effectively improved by gymnastics movement and song, which is a learning medium that caters to their features.

CONCLUSION

The author concludes, based on the results and discussion, that the compiled movement and song practice program has good and valid content validity, making it suitable for enhancing balance movement skills in kindergarten students. Consistent with these findings, this study introduces a novel approach by creating a gymnastics programme that seamlessly integrates with kindergarten children's educational curriculum. This approach not only fosters balance through physical activity but also enhances it through learning activities. Additionally, its tailors' programmes meet the unique needs and abilities of each child. This includes designing activities that consider the differences in each child's level of balance, strength, and motor skills. Additionally, the program aims to assess the impact of the Movement and Song Training Program for Gymnastics on kindergarten students' balance abilities. This can help kindergarten children improve their balance skills. The research restricts its scope to early childhood, specifically those aged 5-6 years. Further research recommendations suggest tailoring this gymnastics program for elementary, junior high, and high school students, taking into account their age and movement level to enhance their balance and movement skills.

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CONFLICT OF INTEREST

This research has no conflict of interest; this research focuses on developing types of exercise that children can use to train their balance.

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