

# Improving Movement Skills and Choreographing Rhythmic Gymnastics Movements for Primary School Sports Teacher Candidates: An Action Research in Indonesia

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**Abstract** Primary school sports teacher candidates require proficient rhythmic gymnastics movements and skills to create rhythmic gymnastics movements suitable for teaching in elementary schools. Their struggles in performing rhythmic gymnastics movements are due to their insufficient grasp of fundamental rhythmic gymnastics techniques, which consequently hampers their capacity to develop and create rhythmic gymnastics movements. This study exemplifies the collaborative efforts of a team dedicated to improving the skills of primary school sports teacher candidates to master rhythmic gymnastics movements and enhance their creativity in devising the rhythmic gymnastics movements through critical-reflective steps in action research design. This study involved 40 primary school sports teacher candidates enrolled in a university in West Java Province in Indonesia. They consisted of 18 female students and 22 male students aged 19-21 years. The findings revealed that there are six steps to improve movement skills and create rhythmic gymnastics, namely (1) introducing the fundamental basic movements of rhythmic gymnastics, (2) understanding the basic elements of music, (3) choosing music and choreographic themes, (4) designing choreography, (5) practicing movement design and music, and (6) integrating movement, music and instruments.

These six steps are believed to be effective not only in improving skills but also the skills to create artistic rhythmic gymnastics movements.

**Keywords** Movement Skills, Movement Creation, Rhythmic Gymnastics, Physical Education, Primary School Teacher

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## 1. Introduction

Primary school sports teacher candidates in Indonesia face a significant challenge when it comes to instructing rhythmic gymnastics to their students. They are expected to design and innovate gymnastic movements themselves, as the physical education curriculum for rhythmic gymnastics primarily outlines basic competencies, core competencies, and learning indicators. The responsibility for creating and developing these gymnastic movements falls upon the teachers. To equip primary school sports teacher candidates in Indonesia with the necessary skills for crafting and evolving rhythmic gymnastics movements, this course is integrated into their university-level primary school physical education teacher education programs.

A survey conducted over the last three years (2016-2018) in a university located in West Java, Indonesia, reported that of each cohort of primary school sports teacher candidates, comprising on average of 100 students, faced challenges in mastering rhythmic gymnastics movements and resulted in difficulty in creating rhythmic gymnastics movements. This issue stemmed from a lack of comprehension on fundamental rules of rhythmic gymnastics movements, low sense of musicality, and a lack of knowledge regarding the core principles of creating and developing rhythmic gymnastics sequences. Therefore, solutive and reflective steps are imperative for enhancing their proficiency in performing rhythmic gymnastics movements and nurturing their creativity in inventing new ones.

Seen from a theoretical framework, improving movement skills in rhythmic gymnastics can be done with regular deliberate practice over a certain period of time. According to Ericsson et al. [1], deliberate practice involves systematic effort to refine specific aspects of one's current performance level through repeated practice sessions. During this process, individuals focus on the critical elements of the task and gradually enhance their performance based on feedback from both their own experiences and guidance from an instructor. The progress achieved through deliberate practice is gradual, and it typically takes several years of dedicated effort to reach a high level of skill in a particular domain [2]–[4]. In fact, even exceptionally talented individuals require approximately a decade of consistent practice before they can compete successfully at the international level [5]–[7].

Likewise, the skills to make rhythmic gymnastics movements need to be trained regularly in several stages. For beginners, an important aspect that must be considered in creating rhythmic gymnastics movements is creating movement sequences [8]. Creating sequences consists of three phases: identifying a sequence focus, collecting ideas, and selecting and organizing these ideas in a sequence [8, p. 66]. Sequences can be advanced on the floor, without requiring any equipment, or they can be practiced using a variety of unconventional equipment arranged in various configurations [9]. It emphasizes on the creative process and the creation of unique and aesthetically pleasing sequences [10]. Through an intense training process and a continuous creative process, students not only achieve proficiency in the movements but also enhance their lives in the realms of creativity and aesthetics, gaining insights into their movement preferences, quality of series of aesthetics gymnastics, and the creative process [8].

A study of Ille & Cadopi [11] researched about the effects of age and skill level in remembering gymnastics movements indicating that movement labeling was the most common strategy to use. Its frequency increases with age, although it does not lead to better memory performance. Performance was higher among participants with better skills. Nevertheless, the role of strategy development in age-related improvements in memory

performance was not clearly demonstrated.

Furthermore, Law et al., [12] identified the key attributes of expert development in rhythmic gymnastics. Their research underscores the significance of extensive training, encompassing both prior routine activities and fundamental components such as ballet and conditioning. These foundational activities serve as the building blocks for mastering basic movements and are closely intertwined with actual performance. Therefore, gymnasts must dedicate additional practice hours, as this commitment directly correlates with success in training routines and the attainment of international excellence in rhythmic gymnastics.

Other researchers have also conducted studies in rhythmic gymnastics with different focuses. Tringali et al. [13] examined the prevalence of characteristic gene profiles in high-level rhythmic gymnasts. Then, Fernandez-Villarino et al. [14] researched the analysis of training load during the competitive period in rhythmic gymnastics. Hökelmann et al., [15] studied group competence in rhythmic gymnastics. Lastly, Yeh et al., [16] conducted a study on the use of a dual task paradigm to identify superior sensory organization abilities in rhythmic gymnastics.

In contrast to the aforementioned prior studies, this study is driven by the challenges faced by primary school sport teacher candidate who faced difficulties in performing and innovating rhythmic gymnastics movements, all while being required to instruct their students this discipline. Therefore, this study aims to improve both the proficiency in executing rhythmic gymnastics movement and the skills to creatively devise the movements through critical and reflective steps.

## 2. Method

### 2.1. Research Design

This study employs action research design. This design has been widely used to solve the problems faced by educators and students, and pedagogical problems in general [17]–[20]. Improving students' skills and creativity to create rhythmic gymnastics movements requires solution and reflective steps. An action research design is considered appropriate to solve the issues in this study as the design seeks to explore practical problems with the intention of developing solutions to the problems [21]. Researchers engaged in self-reflection as part of their action research aimed at enhancing students' proficiency in the development of rhythmic gymnastics movements. This process aligns with the key attributes of action research, which entails specific objectives, such as gaining insights into one's own teaching methods [22].

### 2.2. Team Collaboration

This study involved collaborative teamwork between

researchers and practitioners. Action research provides guidelines and examples for collaborative teams [23–26]. Heil [27] suggested researchers start collaboration by publicizing project requirements and seeing who is interested. Once published, a colleague with music degrees from a separate department was interested in participating in this project because it incorporated rhythmic gymnastics and music. We created a solution learning plan, rhythmic gymnastics movement skill indicators, and student project goals. We required pupils to do rhythmic gymnastics in groups with and without apparatus.

### 2.3. Research Site and Participants

The research was conducted in a prominent university in West Java Province, Indonesia, which is highly regarded and sought after by students from various neighboring districts due to its esteemed reputation. Additionally, this university is recognized for offering high-quality education for primary school sport teacher candidates, as evidenced by the high numbers of enrollment. This study involved 40 students, consisting of 18 female students and 22 male students aged 19-20 years old. Demographics are presented in Table 1. The areas where students come from are quite

heterogeneous, namely Sumedang, Cirebon, Bandung and Kuningan. Demographically, the participants in this study can be seen in Table 1 and the place of research based on the map is presented in Figure 1.

**Table 1.** Demography Participant

Item	Frequency	%
<b>Gender</b>		
<i>Male</i>	22	55
<i>Female</i>	18	45
<b>Age</b>		
<i>19</i>	22	55
<i>20</i>	18	45
<b>City</b>		
<i>Bandung</i>	17	41.5
<i>Sumedang</i>	14	34.1
<i>Cirebon</i>	5	12.2
<i>Kuningan</i>	4	9.8



**Figure 1.** Research Site

## 2.4. Development of Rhythmic Gymnastics Movement Skill Indicators

We developed a set of indicators to measure students' proficiency in performing rhythmic gymnastics movements, classifying them into four levels (Novice – Intermediate – Proficient – Mastery) and four categories (Novice – Intermediate – Skilled – Expert). Table 2 below shows those indicators.

**Table 2.** Indicators of Rhythmic Gymnastics Movement Skills

Level	Indicators	Categorization
Novice	<ul style="list-style-type: none"> <li>Master the basic movements of footsteps and arm swings</li> <li>Master the basic movements of footsteps, hand swings in various directions/positions</li> <li>Master the basic movements of footsteps, hand swings in various positions accompanied by counting and tapping</li> <li>Able to coordinate the basic movements of footsteps, arm swings and body twists accompanied by music</li> </ul>	Novice
Intermediate	<ul style="list-style-type: none"> <li>Master footsteps, hand swings and body twists accompanied by music</li> <li>Master footsteps, hand swings and body twists accompanied by music and combined with children's songs</li> <li>Master the movement of footsteps, arm swings and body contortions accompanied by songs freely and repeatedly</li> <li>Master the movement of footsteps, swinging hands and twisting the body towards the eight corners of the wind accompanied by tapping, singing and a combination of music</li> </ul>	Intermediate
Proficient	<ul style="list-style-type: none"> <li>Media manipulation movements in standing, squatting and sitting positions</li> <li>Move by manipulating the media in a position facing each other</li> <li>Media manipulation movements in playing positions in groups</li> <li>Movement of manipulating the media in a playing position facing each other between groups</li> </ul>	Skilled
Mastery	<ul style="list-style-type: none"> <li>Hand eye movement coordination with stick play</li> <li>Coordinate ankle movements by playing with balloons</li> <li>Coordinate hand eye and ankle movements by playing with ribbon</li> <li>Coordinate the movements of the eyes, hands and ankles by playing hula hoop</li> </ul>	Expert

## 3. Findings

### 3.1. Analysis of Pre-Action Data

A survey was conducted among students to assess their knowledge of rhythmic gymnastics and evaluate their proficiency in both performing and devising rhythmic gymnastics movements. The survey results on the Gutman scale as shown in Table 3 indicate that the subjects were not yet able to create rhythmic gymnastics movements as shown by 33 (82.5%) participants. In addition, majority of the participants did not know about the principles of rhythmic gymnastics, this was stated by 29 (72.5%) participants, while 11 (27.5%) participants stated that they knew about it. However, rhythmic gymnastics is not something foreign to them. This was stated by all participants (100%) that they knew what rhythmic gymnastics was, and all participants (100%) stated that they could do rhythmic gymnastics activities. From the results of this survey, it can be concluded that the participants' lack of knowledge of the principles of rhythmic gymnastics movements has an impact on their insufficiency in creating rhythmic gymnastics movements.

**Table 3.** Rhythmic Gymnastics Knowledge and Skills

Rhythmic Gymnastics Knowledge and Skills	Yes	No
Do you know what rhythmic gymnastics is?	40	
Do you know the principles of rhythmic gymnastics movements?	11	29
Can you do rhythmic gymnastics?	40	
Can you create rhythmic gymnastics movements??	7	33

To test the participants' statement above objectively, we conducted a practical test to map their skills in rhythmic gymnastics by using assessment rubric. Table 4 below shows the results.

**Table 4.** Initial Test Results of Participants' Skills in Rhythmic Gymnastics

Category	Total	Percentage
Novice	23	57.5%
Intermediate	15	37.5 %
Skilled	2	5%
Expert	0	
Total	40	100%

**Table 5.** Participants' Perception of Skills in Creating Rhythmic Gymnastics Movements

Skills for Creating Rhythmic Gymnastics Movements	Strongly Disagree	Disagree	Somewhat Agree	Agree	Strongly Agree
It is important for every Physical Education Teacher to have the skills to develop and create rhythmic gymnastics movements			1	32	7
Making rhythmic gymnastics movements is easy.			2	33	5
It takes a long time to make rhythmic gymnastics movements.			1	17	22
Making rhythmic gymnastics movements needs to be done in groups.		23	12	5	
You need basic knowledge of music to be able to create rhythmic gymnastics movements.			2	23	15
It is necessary to provide in-depth materials to practice the stages of making rhythmic gymnastics movements.				31	9

As seen in Table 4 above, the participants' skills in performing rhythmic activities tended to be at the novice level. The data revealed 15 (37.5%) fell into the novice category, and intermediate categories, and 2 (5%) participants were classified as skilled. In essence, the participants had not yet attained the necessary skills for creating rhythmic gymnastics movements, indicating a need for practical interventions. Before implementing the steps, we explored self-assessed skills in creating rhythmic gymnastics movements. This exploration is crucial, as that the participants' perspective on learning material significantly influences the success of any action. Moreover, these perceptions represent their motivation and learning needs from their own perspective. Table 5 shows the results of their self-assessed skills in creating rhythmic gymnastics movements.

Table 5 above shows that that 32 (80%) participants agreed and 7 (17.5%) participants strongly agreed that it is important for every physical education teacher to have competence in developing and creating rhythmic gymnastics movements. However, there was 1 (2.5%) participant who disagreed.

Regarding the complexity of creating rhythmic gymnastics movements, 33 (82.5%) participants agreed and 5 (12.5%) participants strongly agreed that creating rhythmic gymnastics movements was easy. Meanwhile, 2 (5%) participants stated that they disagreed that creating rhythmic gymnastics was easy, meaning that these two participants found it difficult to create rhythmic gymnastics movements.

Regarding the time required, 17 (42.5%) participants agreed and 22 (55%) participants strongly agreed that creating rhythmic gymnastics movements takes a long time, while 1 (2.5%) participant disagreed.

Regarding the process of creating rhythmic gymnastics movements, 5 (12.5%) participants agreed that creating rhythmic gymnastics movements needed to be done in groups. A total of 12 (30%) participants stated that they somewhat disagreed that it should be done in groups, even 23 (57.5%) participants stated that they disagreed. This information also represented the participants' learning style.

The majority of participants, apart from kinesthetic, also tended to have an intrapersonal learning style. Moreover, the majority of participants stated that they needed to get in-depth knowledge of the material to practice the phases of making rhythmic gymnastics movements. This was seen as 31 (77.5%) participants agreed and 9 (22.5%) participants strongly agreed about this.

Regarding basic understanding of music, 23 (57.5%) participants agreed and 15 (37.5%) participants strongly agreed that the participants required basic knowledge of music in creating rhythmic gymnastics movements. Meanwhile, 2 (5%) participants disagreed.

### 3.2. Pre-Action Evaluation Results

According to the data analysis conducted during the pre-action phase, the primary school sports teacher candidates exhibited skills falling primarily within the novice and intermediate categories. Therefore, addressing this issue is imperative, given their notable motivation levels. This motivation is evident in participants' perceptions regarding the significance of the rhythmic gymnastics movement creation process, their willingness to invest substantial time in it, and their expressed need for a deeper understanding of fundamental music concepts and in-depth study of materials related to rhythmic gymnastics movements.

### 3.3. Actions for Development of Gymnastics Movements

Based on the results of the pre-action evaluation, we developed 6 critical steps as an effort to improve the participants' skills in creating rhythmic gymnastics movements, all steps implemented were taken in 14 meetings. For each meeting takes 100 minutes as elaborated below:

#### Step 1: Introducing the Fundamentals Basic Movement of Rhythmic Gymnastics

There are several fundamental basic movements that need to be developed in rhythmic activities including: (1)

Locomotor movements, such as walking, running, hopping, jumping, skipping, sliding, galloping, and leaping; (2) Non-locomotor movements, such as swaying, swinging, contracting/stretching, bending/straightening, and turning; (3). Manipulative movements, such as throwing, catching, dribbling [28]–[30].

To introduce those three fundamental movements in rhythmic gymnastics activities, we utilized Android-based information technology applications named *Tantangan Kebugaran 30 Hari – Latihan Rumahan* (30-Days Fitness Challenge – Home Workout) (see Figure 2). This application was developed by Leap Fitness Group and has been downloaded by more than 10 million people. This

application serves as a comprehensive guide for maintaining physical fitness. It offers a structured body movement training program that includes full-body, abdominal, buttocks, arm, and leg training routines. Through this app, users can access detailed instructions on various exercises for different body parts, along with recommended daily durations, as illustrated in Figures 3 and 4. One notable advantage of this application is its integration with YouTube for visual demonstrations, as well as its month-long exercise programming, which provides users with a step-by-step progression through various stages and levels of physical activity, as depicted in Figures 3 and 4.

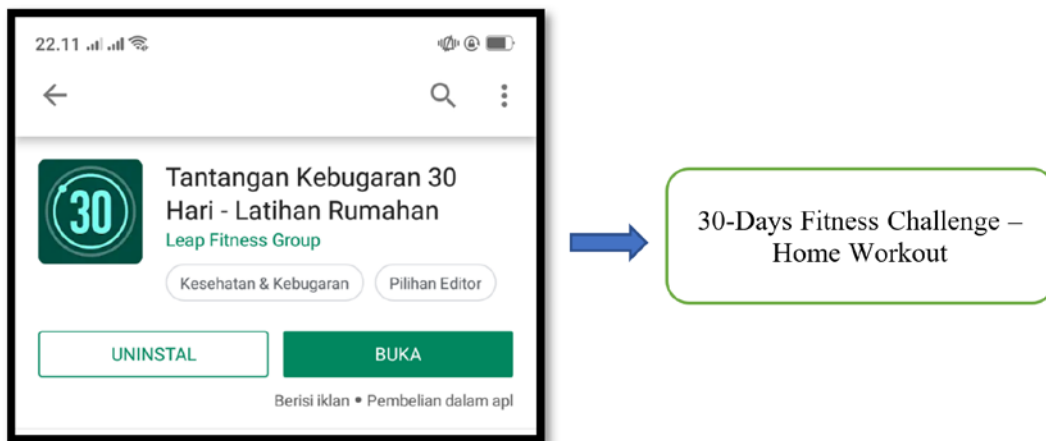


Figure 2. Tantangan Kebugaran 30 Hari – Latihan Rumahan Application Display on Mobile Application

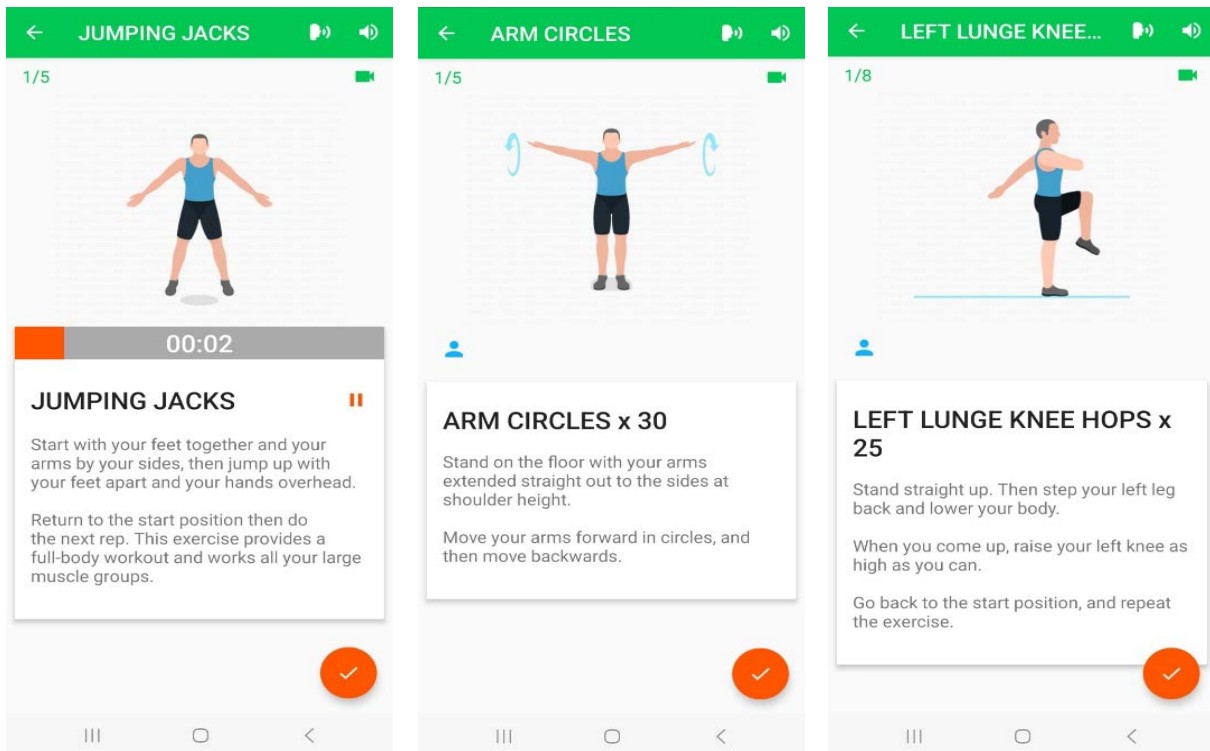


Figure 3. Types of Movements Displayed in the Application

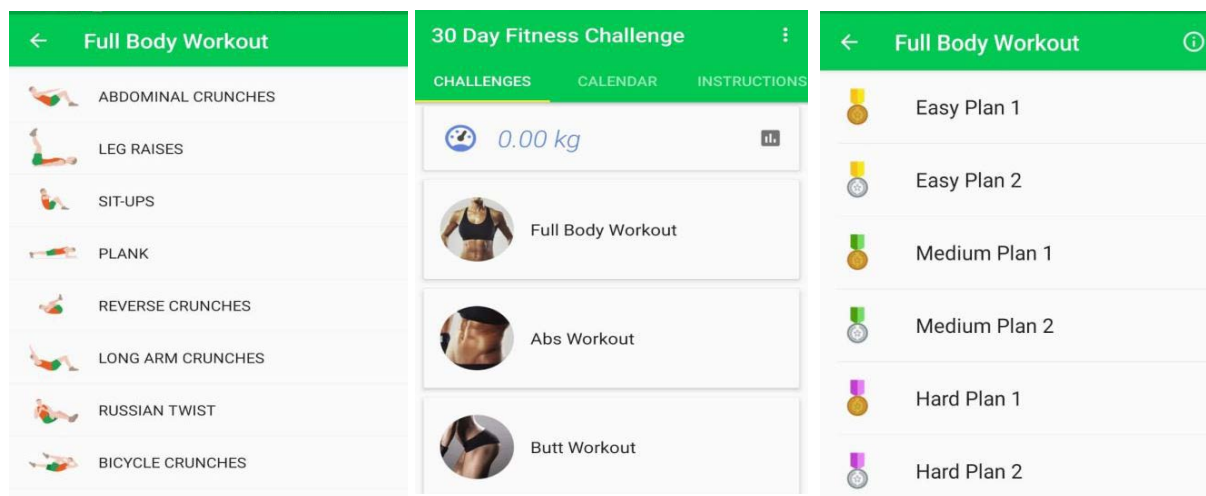


Figure 4. Exercise Program Display

Table 6. Rhythmic Gymnastics Fundamental Movement Test Results

No	Indicators	Poor	Fair	Satisfactory	Good	Excellent
1	Able to mention the name of movements types			3	34	3
2	Able to mention the advantages of each movement			5	29	6
3	Able to perform each movement			3	35	2

By utilizing this application, participants were expected to gain a comprehensive understanding of each movement type and its corresponding body benefits. This knowledge serves as an initial step towards their development and innovation of rhythmic gymnastics movements. In terms of instructional strategy, we guided students to download the application, compile an inventory detailing each movement type and its associated advantages, and diligently practice each set of instructions. During the evaluation phase, participants underwent a series of tests designed to assess their knowledge of different movement types and their respective benefits, as well as their practical application of these movements. The results of these tests, specifically pertaining to participants' knowledge of movement types and their benefits, are presented in the table 6.

Based on table 6, in the first indicator, 3 (7.5%) participants were in the satisfactory category, 34 (85%) were in the good category and 3 (7.5%) participants were in excellent category. This first indicator shows that the majority of participants already knew and could mention movements types, for example star movements, triceps dip movements, Bulgarian split squat left and right.

In the second indicator, 5 (12.5%) participants were in the satisfactory category, 29 (72.5%) participants were in the good category and 6 (15%) participants were in the excellent category. Based on the test results, the majority of participants tended to understand the function and benefits of each type of movement. For example, star jumping movement to practice the whole body to move large muscle groups, triceps dips to train the chest and arms and so on.

In the third indicator, 3 (7.5%) participants were in the satisfactory category in practicing each type of movement, 35 (87.5%) participants were in good category and 2 (5%) participants were in excellent category. From this first step it can be concluded that the majority of participants knew, understood, and were able to practice every fundamental basic movement in rhythmic activities. This stage requires a learning process that takes three meetings over three weeks, with the time needed for one meeting being 100 minutes.

## Step 2. Understanding the Basic Elements of Music

During this phase, we introduced participants to four fundamental aspects of musicality, spanning two sessions. In the initial meeting, we delved into the concepts of "Takt and Beat." Takt represents a unit of time in music, typically comprising 4 beats (4/4-time signature), while a beat signifies a regularly recurring rhythmic pulse. To illustrate these concepts, we incorporated music with a clearly defined tempo, facilitating participants in perceiving Takt and Beat. Additionally, visual aids such as a metronome were employed to further enhance comprehension. Beyond Takt and Beat, we explored the dynamics of music, encompassing factors like volume (*forte* and *piano*), emphasis, and alterations in speed (*accelerando* and *ritardando*). Subsequently, we delved into the core material of rhythm, which is intricately linked to movement. Participants were introduced to different time signatures, including 2/4, 3/4, and 4/4, and were trained to recognize rhythm patterns within music. Lastly, we covered musical structures, including components like intro, verse, chorus,



bridge, and outro in songs, providing participants with a comprehensive understanding of the organization and arrangement of musical compositions. To ensure they have understood and mastered the material presented. A number of tests were given by presenting a song. Then they were instructed to explain the takt and beat, explain the dynamics of the music and rhythm, and identify the parts of the song structure. The evaluation results showed that 18 (45%) participants were included in the excellent understanding category and 22 (55%) participants had a good level of understanding of the material provided. This stage requires a learning process that takes two face-to-face meetings over three weeks, with the time taken for one meeting being 100 minutes.

### **Step 3: Choosing Music and Choreographic Themes**

In this phase, building upon their understanding of music and its alignment with time, participants were tasked with practical application. Following their exposure to fundamental music concepts, all participants were directed to choose music that matched the theme and mood of rhythmic gymnastics, with a focus on dynamics that complemented their desired movements and expressions. This step aimed to nurture their musical taste and music interpretation skills. Participants were instructed to select and interpret music, involving identifying the emotional nuances of the chosen music and crafting movements that harmonized with their interpretation. They also determined the ideal duration for their gymnastic routines and selected music accordingly, ensuring that the tempo of their chosen music matched the intended movements. At this phase, students had the freedom to select either instrumental or vocal music in line with their choreographic concept, with each participant finalizing their music choice. This stage requires a learning process that takes place one face-to-face a week, with the time taken for one meeting being 100 minutes.

### **Step 4: Designing Choreography**

During this phase, participants were tasked with devising movements inspired by the music they had selected. These movement plans were documented in a descriptive format, comprising three key components: warm-up movements, core movements, and cool-down movements. Within each of these segments, participants provided detailed descriptions of hand, foot, and head movements or combinations thereof, highlighting how these movements conveyed the musical nuances as per their interpretation. Synchronization with time was integral, involving counts such as 1, 2, 3, 4, ensuring that the movements harmonized seamlessly with the music. This phase culminated in the

creation of a comprehensive rhythmic gymnastics movement guide module. This stage requires a learning process that takes two face-to-face meetings over two weeks, with the time taken for one session being 100 minutes.

### **Step 5: Practicing Movement Design and Music**

During this phase, participants put their written movement plans into practice. Those who had designed the movements assumed the role of gymnastics instructors, enlisting other students as participants. After executing the gymnastic movements, each participant provided feedback on various aspects, including the alignment of the movements with the music's rhythm, beat, and nuances. This feedback served as valuable input for refining the design of the rhythmic gymnastics movements. Frequently, students suggested incorporating additional elements such as balls, balloons, or threads into the routines. Consequently, the subsequent phase involved practicing the improved movements by seamlessly integrating movement, music, and these additional elements. This stage requires a learning process of three face-to-face meetings over three weeks, with the time taken for one meeting being 100 minutes.

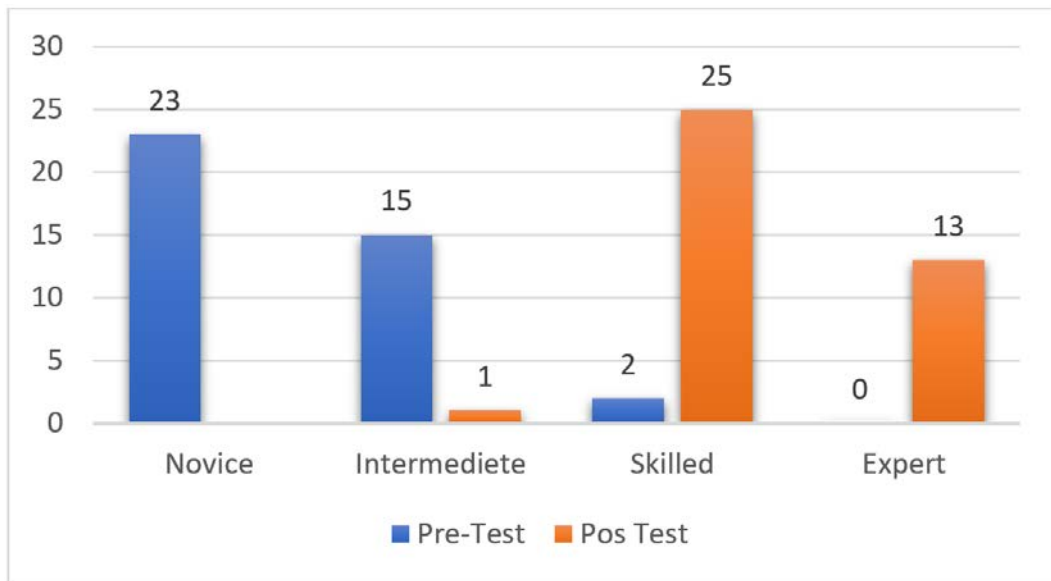
### **Step 6: Integrating Movement, Music, and Instruments**

Rhythmic gymnastics combines elegant body movements and artistic expression, often incorporating instruments like balls, threads, and bracelets. Intensive training focused on mastering instrument handling and technique, guided by the instructor's modeling examples. The goal was to ensure participants could seamlessly integrate these instruments into their movements. Subsequently, participants practiced rhythmic gymnastics movements that incorporated music, choreography, and instrument use, incorporating feedback from the previous phase. Each movement was performed and rigorously evaluated for refinement. This stage requires a learning process of three face-to-face meetings over three weeks, with the time taken for one meeting being 100 minutes.

## **3.4. Post-Action Evaluation**

Following the implementation of the six action steps outlined, there was a noticeable improvement in participants' proficiency in both executing movements and creating rhythmic gymnastics movements. This improvement became evident upon comparing the results of the pre-test and post-test, illustrated in Figure 5 below.





**Figure 5.** Comparison of Pre-Test and Post Test Result

As depicted in Figure 5 above, there was an increase in participants' skills in creating rhythmic gymnastics movements. During the pre-action phase, only 2 participants who were in the skilled category and the remaining 38 participants were categorized as intermediate and novice. Conversely, following the post-test assessment, 26 participants were in the skilled category and 14 participants reached expert level

The participants' skill improvement was striking, with many making significant leaps in proficiency levels. For instance, all 23 participants were initially categorized as novices during the pre-test advanced to the skilled level in the post-test, showcasing remarkable progress. Furthermore, 3 participants, initially in the intermediate category during the post-test, moved up one level to the skilled category, contributing to a total of 26 participants at the skilled level. Simultaneously, among the 15 participants classified as intermediates during the pre-test, three experienced a one-level advancement, while the remaining 12 made a remarkable two-level jump to attain the highly skilled status in the post-test. Additionally, 2 participants who had been skilled during the pre-test ascended to the expert level in the post-test. Consequently, notable 35 participants achieved significant proficiency increases, with 23 elevating from novice to skilled and 12 participants progressing from intermediate to expert. Moreover, 5 participants underwent a one-level improvement, with 3 participants advancing from the intermediate level in the pre-test to the skilled level in the post-test and two moving from the skilled level in the pre-test to the expert level in the post-test.

## 4. Discussion

Rhythmic gymnastics is an interesting physical and artistic activity to teach to students. It combines elegant

body movements and artistic expression using tools such as balls, threads, and bracelets [31], [32]. Teaching rhythmic gymnastics to students can be a fulfilling and educational experience [33], [34]. This not only helps them in physical development, but also fosters their creativity, coordination and understanding of art [35]. Therefore, sport teacher candidates must be skilled and able to produce work in rhythmic gymnastics. Creating rhythmic gymnastics works allows prospective teachers to explore and develop their creativity [36]–[38]. They can produce unique movements, facial expressions, and use of tools, which can inspire students to think creatively in their own rhythmic gymnastics [38], [39]. By creating their own work, teacher candidates will gain a deeper understanding of rhythmic gymnastics concepts. They will know better how music, movement, and instruments can be well integrated to create a coherent and artistic performance [39]–[41]. Therefore, for sport teacher candidates who want to teach rhythmic gymnastics well, creating rhythmic gymnastics works can be a fundamental step in developing their understanding, skills and credibility in this field. In addition, their work can provide inspiration and guidance for their students in understanding the art of rhythmic gymnastics [42], [43].

Enhancing the proficiency of primary school sports teacher candidates in executing and devising rhythmic gymnastics movements is a priority, given their academic focus on sports rather than arts. It is worth noting that their proficiency in artistic elements, particularly music, may be quite limited. Thus, imparting the fundamentals of music for rhythmic gymnastics assumes significant importance in aiding these future physical education instructors in honing their skills. It is crucial to bear in mind that rhythmic gymnastics revolves around the harmonious synchronization of graceful body movements with music [44].

The movements designed in rhythmic gymnastics need to meet fitness standards to ensure that this activity

provides optimal health benefits for the performers. Therefore, the things that need to be considered in designing movements by teachers are, as follows. First: Cardiovascular (Cardio) Endurance. The movements in rhythmic gymnastics, especially when performing energetic routines, should help improve cardiovascular endurance [45], [46]. This means that the movements designed are capable of cardiovascular training with a level of intensity sufficient to increase the student's heart rate and breathing. Therefore, it can increase their cardiovascular capacity [46], [47]. Second: Strength. Rhythmic gymnastics often involves movements that require body strength, such as body lifts, jumps, and equipment movements [48], [49]. To meet fitness regimens, it is important to engage in strength training that covers the entire body, including bodyweight exercises such as push-ups and squats [49], [50].

Third: Flexibility. This is important in rhythmic gymnastics. Movements that require extension and flexibility of the body must be represented in a series of movements safely and correctly. Stretching exercises should also be a part [51], [52]. Stretching exercises should also be part of an exercise program to increase body flexibility. Fourth: Balance and Coordination. Rhythmic gymnastics relies on body balance and good coordination [53], [54]. Practicing balance and coordination is an important part of rhythmic gymnastics training and can help improve overall fitness. Fifth: Warming-Up and Cooling-Down. This includes an effective warm up before exercise and cool down after exercise is an important part of meeting the fitness regimen. This helps reduce the risk of injury and helps the body adapt to changes in training intensity [54]–[56]. Sixth: Breathing control is an important skill in rhythmic gymnastics [57], [58]. Students must understand how to breathe properly during movement to maintain smooth movement and optimize physical performance. Adhering to these fitness principles not only promotes holistic well-being but also nurtures the development of elegant and expressive artistic skills among rhythmic gymnasts. Furthermore, it is essential to take into account individual skill levels and tailor exercises to align with each student's unique abilities and objectives.

## 5. Conclusions

This study establishes six key steps for enhancing skills and crafting rhythmic gymnastics movements, namely: (1) introducing the fundamental basic movements of rhythmic gymnastics, (2) understanding the basic elements of music, (3) choosing music and choreographic themes, (4) designing choreography, (5) practicing movement design and music, and (6) integrating movement, music and instruments. These six steps embody a process of critical reflection, shaping teachers who possess not only proficiency in performing rhythmic gymnastics but also the skills to create rhythmic gymnastics movements that blend

the artistic and kinetic aspects. Through this study, these six steps have demonstrated their effectiveness in elevating the skills of primary school sport teacher candidates in creating rhythmic gymnastics movements.

## 6. Suggestion

In light of the aforementioned conclusion, these six steps can be effectively incorporated into the learning process to enhance movement skills and foster the creation of rhythmic gymnastics routines. Furthermore, there is substantial potential in further developing and refining these learning steps into a method or model for teaching rhythmic gymnastics.

## Limitation

This study was limited to a small group of participants, specifically primary school sports teacher candidates within a single geographical area, thus employing an action research design. To expand and enhance the scope of this study, its findings can serve as a foundation for broader-reaching impacts by employing a development research design.

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