

# The development of instructional media for rhythmic gymnastics in physical education course

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**Abstract.** Without employing additional media, it is assumed that students of physical education department might become less creative in developing body movements for gymnastics. Therefore, this study aimed at developing instructional media of rhythmic gymnastics for students who will become physical education teachers of primary schools. The instructional media development utilized some aids and musical instruments. The study employed experimental method with quasi-experimental design. The subjects of this study were students of primary school teacher education of physical education department. The study involved two classes including Class A as an experimental group consisted of 30 students and Class B as a control group consisted of 30 students. The data collection techniques were observation and a series of rhythmic gymnastics at both pre-test and post-test. The results indicated that the learning ability of the two groups were different after conducting the learning process of rhythmic gymnastics. The experimental group that utilized developed instructional media of rhythmic gymnastics showed a significant improvement compared to the control group that utilized conventional rhythmic gymnastics media. Therefore, it can be concluded that the development of instructional media for rhythmic gymnastics was able to improve the quality of rhythmic gymnastics learning.

## 1. Introduction

One of the problems in rhythmic gymnastics course for physical education department students is their lack of creativity in developing beautiful body movements, which results in the low quality of the rhythmic gymnastics learning. Whereas, gymnastics, as one of the activities of physical literacy, needs to be developed in order to build strong motor development for later stage of health development, especially for children.

Various sources state that the quality of physical education is not only determined by the success of the lecturer in applying their methods, approaches, and models, but also in the use of instructional media. In other words, the use of instructional media contributes to the development of interaction process between lecturers and students because the use of instructional media as instructional aids can encourage the students to be more creative in the learning process.

Therefore, it requires hard work from various parties to prompt creative ideas from students of rhythmic gymnastics course through the use of instructional media. Instructional technology/media for learning-teaching process provides the tools to engage learners powerfully in the learning process [1].



The use of instructional media in learning rhythmic gymnastics is essential to create an exciting and fun atmosphere, so that students are encouraged to create various rhythmic gymnastics movements at their best. Without using instructional media, students usually get stuck during their attempt to develop their own movements. According to the results of an initial study, students found it difficult to develop body movements in rhythmic gymnastics course despite being expected to be able to create various movements. Without instructional media, the students did not get enough ideas. In other words, they did not get sufficient stimulation to develop body movements. A research discovered that brain stimulation can be used as a tool to modulate and to explore components of creativity [2]. Therefore, the main objective of this study was to test the instructional media of rhythmic gymnastics developed by the research team as a stimulus for the students with the hope of creating a viable instructional media for rhythmic gymnastics courses in universities.

Previous studies on rhythmic gymnastics headed towards different directions. Kioumourtzoglou, Derri, Mertzanidou and Tzetzis [3] examined perceptual and motor skills in rhythmic gymnastics. Douda, Toubekis, Avloniti and Tokmakidis [4] studied the physiological and anthropometric determinants of rhythmic gymnastics performance. Law, Côté and Ericsson [5] examined the characteristics of expert development in rhythmic gymnastics. Calavalle, Sisti, Rocchi, Panebianco, Del Sal [6] examined the expertise in rhythmic gymnastics in relation to increasing control in lateral directions. As with other previous studies, there has not been any studies conducted with a focus on the use of instructional media to improve students' creativity in developing body movements in rhythmic gymnastics.

Therefore, this study was conducted not only to fill the gap on studies about students' creativity improvement in rhythmic gymnastics through the use of instructional media; but also to address the needs of creative instructional media to facilitate physical education students' achievements of instructional objectives. It is considered significant as they are prospective sport teachers who are going to shape the future of sport subjects in primary school.

## 2. Method

This study employed quasi-experimental method with nonequivalent control-group design. Borg and Gall [7] state that, in this kind of study, the participants are not randomly selected to be involved in the experimental and control groups. Furthermore, this research design involved two groups in a pre-test and post-test. The samples of the study include the 2nd semester students who took learning activities and rhythmic gymnastics course. The sample consisted of 60 persons selected from a population of 105 students with simple random sampling. The 60 students were divided into two groups, the experimental group with 30 people (class A) and the control group with 30 people (class B).

The experimental group learned rhythmic gymnastics using the developed instructional media, while the control group used standard (conventional) instructional media. The instructional media used in the experimental group consisted of rebanas (a tambourine of Indonesia used especially in Muslim religious ceremonies), kecreks (a kind of percussion that commonly used to give signal or movement cues), rattan hula hoops, ribbons, sticks, and balloons. Meanwhile, the instructional media used in the control group consisted of clubs, balls, and lightweight metal hula hoops.

The instruments used in this study were pre-test before treatment and post-test after treatment. The validity of the instruments was tested with expert judgment and field test. The collected data were analyzed using SPSS (IBM SPSS Statistics 21) software. The level of significance in the statistic test was  $\alpha = 0.05$ , where, if  $P\text{-value} < \alpha$ , then  $H_0$  rejected and if  $P\text{-value} \geq \alpha$  then  $H_0$  accepted.

## 3. Result and discussion

The analysis of rhythmic gymnastics skill consisted of the analysis of the pre-test, post-test, and improvement of both (N-Gain) scores in the experimental group and control group. The average difference test of the pre-test, post-test, and N-Gain scores was done using Mann-Whitney U test because there was one data that was not normally distributed in each test.

### 3.1. Pre-test

The average score in the experimental group and in the control group were 6.423 and 7.192 respectively. Then, an inferential statistical test was conducted.

**Table 1.** Average difference test of rhythmic gymnastics skill pre-test score.

	Mann-Whitney U	Z	Asymp Sig (2-tailed)	Conclusion
Rhythmic Gymnastics Skill Pre-Test	205.000	-0.505	0.544	H <sub>0</sub> is accepted

Table 1 shows that the sig.  $0.544 \geq \alpha$ , which means that H<sub>0</sub> was accepted. In other words, the average rhythmic gymnastics skill pre-test score of the experimental group and the control group were not different.

### 3.2. Post-test

The average score in the experimental group and in the control group were 21.39 and 14.23 respectively. Then, an inferential statistical test was conducted.

**Table 2.** Average difference test of rhythmic gymnastics skill post-test score.

	Mann-Whitney U	Z	Asymp Sig (2-tailed)	Conclusion
Rhythmic Gymnastics Skill Post-Test	65.000	-6.205	0.000	H <sub>0</sub> is rejected

Table 2 shows that the sig.  $0.000 < \alpha$ , which means that H<sub>0</sub> was rejected. In other words, the average rhythmic gymnastics skill post-test score of the experimental group and the control group were different.

### 3.3. N-Gain

The N-Gain score in the experimental group and in the control group were 0.85 (high) and 0.43 (moderate) respectively. Then, an inferential statistical test was conducted.

**Table 3.** Average difference test of rhythmic gymnastics skill n-gain score.

	Mann-Whitney U	Z	Asymp Sig (2-tailed)	Conclusion
Rhythmic Gymnastics Skill N-Gain	26.500	-5.708	0.000	H <sub>0</sub> is rejected

Table 3 shows that the sig.  $0.000 < \alpha$ , which means that H<sub>0</sub> was rejected. In other words, the improvement in rhythmic gymnastics skill of the experimental group and the control group were different. The result of the pre-test score statistical analysis at  $\alpha = 0.05$  shows that there was no difference in the prior students' rhythmic gymnastics skill. So, the students can be said to have the same level of rhythmic gymnastics skill. After the treatment was given to the students in each group, the result of the post-test score statistical analysis at  $\alpha = 0.05$  indicates that there was a difference in the rhythmic gymnastics skill of the students' in the experimental group and in the control group.

Therefore, although the two treatments given in this study affected the rhythmic gymnastics skill of the students in each group, the developed media improved the rhythmic gymnastics skill better than the conventional media.

In the learning process, the control group followed the movements exemplified and instructed by the lecturer. As a result, when assigned to develop a series of rhythmic gymnastics movements, they were less capable of developing new, innovative movements.

Meanwhile, in the experimental group, the lecturer acted as a director without providing direct example or instruction. In other words, students were given the freedom to develop more varied rhythmic gymnastics movements using the developed media. As a result, the experimental group demonstrated the ability to develop their own creative and innovative movements. In fact, the movement they developed can be considered better than the usual movements exemplified or instructed by the lecturer. What follows are some examples of the movements developed by the experimental group.



**Figure 1.** Movements with ribbons.



**Figure 2.** Movements with rebanas.



**Figure 3.** Movements with balloons.

Figure 1 shows a group of students performing a series of movements. The figure is proof that the experimental group was capable of developing rhythmic gymnastics movements using ribbons. Furthermore, the movements performed with the utilization of rebanas can be seen in Figure 2. The figure also shows that the experimental group was capable of developing a series of systematic rhythmic gymnastics movements. In addition, Figure 3 shows the student's capability in developing movements using balloons. Through the use of instructional media, the students became more imaginative in developing various rhythmic gymnastics movements. The above media are used to make students adequately informed and prepared about what they are expected to learn, so they can make connection between the subject objectives and the media that they are exposed to. It was done based on the following

management of instruction: planning instruction, introducing instruction, practicing instruction and evaluating instruction.

The planning instruction was done by selecting media, namely ribbon, rebana and balloon. These media were selected based on the consideration that those media easily to obtain and use. Then, the introducing instruction was done to introduce the selected media to the students. However, the lecturer did not provide some examples of the use of those media in order to stimulate students' creativity in developing those media. Next, in the practicing instruction, the students were asked to develop some movements using those media. Lastly, evaluating instruction was done to evaluate students' achievements in developing creative movements using those media.

Gonzales & Batanero state that using modified instructional media is a very effective way to improve rhythmic gymnastics skill [8]. Meanwhile, Carlos & Rosell state that developing an instructional media by modifying the instructional aids will encourage students to manage information autonomously, collaborate with others, develop ideas, always try to make self-improvements, and have their own views [9].

One of the aims of modifying instructional media is at developing skills in competing for excellence [10]. In addition, the study conducted by Morrales-Mann & Kaitell concluded that the development of instructional aids was beneficial for students to improve their autonomous learning, critical thinking, problem-solving, and communication skills [11]. Moreover, a study conducted by Wong and Lam found that modifying instructional media resulted in better learning achievements, especially in the creativity aspect [12].

In conclusion, this study supports the idea that developing instructional media through modifying instructional aids can improve students' creativity, knowledge, and skills, especially in rhythmic gymnastics learning in physical education major.

#### 4. Conclusion

Based on the results and discussion, it can be concluded that the rhythmic gymnastics skill of the students in the control group and experimental group had no difference before the treatment was given. Then, after the treatment was given to each group, there was a significant skill difference between the two groups. The improvement in the two groups was different, in which the experimental group's improvement, which was exposed to developed instructional media, was better than the control group. The experimental group was exposed to the media that was selectively done using management of instruction. It consists of planning instruction, introducing instruction, practicing instruction and evaluating instruction. In another word, the selection of media has to be considered seriously, so the learning objectives can be achieved.

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