

The Effect of Audio and Audio Visual Imagery Exercises on the Level of Creativity of Aerobic Gymnastics Instructors

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Abstract Background: The gymnastics instructor must have kinesthetic intelligence to express his creativity. The exercise of imagery becomes one of the methods to increase creativity. However, in its application, the imagery method is still minimally carried out to increase the creativity of gymnastics instructors. Therefore, the purpose of this study is to test visual and audio-visual imagery exercise methods against the level of creativity of aerobic gymnastics instructors. **Material and Methods:** A 2x2 factorial experiment was used as the research method. The sample of nationally licensed aerobic gymnastics instructors was men and women aged 20-50 years and totaling 40. Data were collected using kinesthetic intelligence test instruments and the Torrance test of creative thinking (TTCT). The data were analyzed using two-way ANOVA with the help of the SPSS 23 application. **Results:** There was no significant difference between audio and audio visual imagery exercises as indicated by $F_{0.002}$, $sig_{0.961} > 0.05$, mean of 11.6 audio-visual imagery, 18.5 audio-visual imagery, and difference of 4.7. There was a significant difference between high and low kinesthetic intelligence gymnastic instructors since the $F_{4.766}$, $sig_{0.036} < 0.05$, mean 14.4 low kinesthetic intelligence, 15.7 high kinesthetic intelligence, difference 1.3. There was no significant interaction between imagery audio and audio visual methods with high and low kinesthetic intelligence on choreographic originality, with an overall sig value of > 0.05 . **Conclusion:** In conclusion, audio-visual imagery exercise is superior to audio-imagery

training, and high kinesthetic intelligence is highly useful to gymnastics instructors' creativity levels. The implication is that it is possible to utilize audio-visual to develop choreography creativity since it can boost the choreography creativity of gymnastics instructors with high and low kinesthetic intelligence.

Keywords Imagery Training, Kinesthetic Intelligence, Choreography Creativity, Gymnastics Instructor, Aerobics

1. Introduction

Today, the community has taken an active role in maintaining a healthy lifestyle through various activities, one of which is aerobic exercise, which is popular in the community [1]. Gymnastics is a systematic physical exercise that uses movements that are regulated and selected to reach a high level of health [2]–[4]. Furthermore, aerobic exercise is a type of exercise that uses large muscles to generate energy through combustion using oxygen [5].

Aerobic gymnastics is not only popular among women; males also engage in maintaining a healthy and fit body [6]. Aerobic gymnastics is regarded as a pleasurable physical activity with remarkable benefits such as weight loss, body shaping, and improved quality of life [7]–[10], Aerobic gymnastics is a type of physical training that mixes

rhythmic movements and music to create a relaxing effect [11]. Each aerobic exercise movement has its meaning and application, such as increasing posture, physical health, and skill [12].

Talking about gymnastics skills is certainly not distant from an instructor's or gymnastics coach's responsibility in creating and composing a choreography of gymnastics movements to make it more fascinating and varied. The coach or instructor's responsibility is to establish a goal, plan, monitor, guide, and control the training process [13]. Additionally, as a holistic instructor, he must be able to provide a favorable influence in terms of mental, physical, intellectual, and master training approaches to be innovative [13].

According to another study, the performance of coaches and instructors in conveying information and technology to society is unquestionably critical to the advancement of sports [14]. This refers to a gymnastics instructor's inventiveness in assembling a simple movement. Gymnastics instructors must be creative to present gymnastics activists with exciting and simple choreography. As a result, gymnastics instructors must be more creative while creating choreography.

Routinely practicing and memorizing movements is one way to develop creativity in choreographic composition. But that's not all; there are additional initiatives underway to boost gymnastics instructors' creativity. What level of effort? One of them can employ the visualization technique. Imagery is a psychologically well-known approach for improving sports skills and performance [15]–[18].

Imagery is a type of visualization and simulation that uses the five senses to create an experience in the mind as if it were real [19]. Imagery training is a technique that is used consciously to overcome issues, increase focus, and improve creativity as a vision and movement simulation [20]–[23]. According to the aforesaid viewpoint, imaging exercises are beneficial for increasing individual and team creativity to achieve what is expected.

It has been claimed that kinesthetic imagery, olfactory imagery, audio imagery, and visual imagery modalities can be employed in imagery exercise [24]–[28]. Kinesthetic imagery refers to the sensation of movement while acting. Auditory imaging focuses on noises such as hearing the applause of the audience or the sound of hitting the ball, whereas visual imagery focuses on how something might be viewed inside or outward. Furthermore, there is olfactory imagery, which focuses on the sense of smell as it relates to sports, such as the scent of grass [29] [30].

According to the study, there are numerous sorts of imaging exercises. Of course, these types have benefits and limitations, so when an experiment is performed, they will have varied improvements. Also, a gymnastics instructor's level of intellect is significant; the greater the level of intelligence, the better he can master and organize choreographic movements. Intelligence is highly required and crucial for all humans because intelligence benefits include being able to assist someone face and handling

daily challenges at work or outside concerns [31]. As a result, one's creativity can undoubtedly be observed via one's kinesthetic intelligence; of course, the greater the intelligence, the easier it is to learn new things.

According to gymnastics instructors interviewed in Solo Raya, Central Java, it is still challenging for them to compose and produce new choreography with different moves that mix movements dynamically and harmoniously. Furthermore, determining motions for distinct body muscles to focus on different body muscles, as well as adjusting the fitness and strength levels of each gymnast participant, remains tough.

There are still gymnastics instructors that receive scores in the "poor" and "very poor" categories based on the requirements analysis through the choreographic originality exam. This can help to reinforce the problem and give a rationale for issues relating to this research. Research on images, particularly for a gymnastics coach, is still limited, thus a test is required. Based on the concerns outlined, the researcher will perform studies for gymnastics teachers in terms of kinesthetic intelligence by employing imagery training approaches via audio and audio-visual media. This is significant because it gives knowledge to practitioners and academics interested in aerobic exercise, allowing them to deliver the best in the future.

2. Materials and Methods

2.1. Participants

The sample in this study consisted of 40 nationally licensed aerobic gymnastics instructors ranging in age from 2 to 50 years. They were separated into two groups by administering the kinesthetic intelligence exam in dance [32] [36]. The findings were used to match subject ordinal pairing (MSOP) with the A-B-B-A pattern technique, with the goal of the group not being lame. Based on the testing and application of the MSOP pattern, it was decided that 20 gymnastics instructors with high and low levels of kinesthetic intelligence would receive imagery intervention with audio media, while the remaining gymnastics instructors with high and low levels of kinesthetic intelligence would receive imagery intervention with audio visual media. In one intervention group, 10 trainers with high and low kinesthetic intelligence were taught auditory and audio-visual visualization approaches. The tool utilized in the pretest for the audio and audio-visual groups was a standardized creativity test instrument, the Torrance Test of Creative Thinking Verbal (TTCT) [33]–[35].

2.2. Research Design

This research is an experiment using field testing [36] [51]. The method employed was 2x2 factorial, with two

independent variables to be provided intervention, one attribute variable, and a controlled dependent variable [37], [38]. Total sampling was used as the sampling technique. Following the initial test, participants were given an intervention using audio and audio-visual imaging approaches before the post-test using the same instrument to evaluate whether there was any improvement between the initial and post-test.

Table 1. 2x2 Factorial Design

Imagery		
Intelligence kinesthetic (K)	Imagery audio (L1)	Imagery audio-visual (L2)
High (K1)	(L1K1)	(L2K1)
Low (K2)	(L1K2)	(L2K2)

Note:

L1: imagery exercise with audio presentation

L2: imagery exercise with audio visual presentation

K1: High kinesthetic intelligence

K2: Low kinesthetic intelligence

L1K1: imagery exercise with an audio presentation at high kinesthetic intelligence

L1K2: imagery training with an audio presentation at low kinesthetic intelligence

L2K1: imagery exercise with an audio-visual presentation at high kinesthetic

L2K2: imagery exercise with an audio-visual presentation at low kinesthetic

2.3. Statistical Analysis

The 40 participants were divided into two groups of 20 each. The gymnastics instructor received the imagery technique treatment, which included audio and audio visual presentations. The monitoring approach for providing the imaging method is as follows: (1) Gymnastics teachers focused on aerobic exercise choreography. Instructions and examples were provided in videos and films. The gymnastics instructor paid attention, examined the presentation carefully, and concentrated; (2) The gymnastics instructor did imaging exercises with the researcher's observation through zoom and made a presentation using *Google Form*; (3) the gymnastics instructor was then encouraged to imagine and visualize the exercises that had been performed recorded and reflected in the gymnastics instructor's head written in *Google Form* Monitoring imagery exercises were accomplished by a gymnastics instructor writing down any imaginable gymnastic movement, which was then written into a series of gymnastic movements so that researchers could determine the success of aerobic exercise choreography creativity by using imagery exercises. The collected data was then processed with the SPSS version 23 application. Data analysis using descriptive analysis (table 2), then will be continued using two-path Anova analysis (table 3) (table 4) (table 5), then if there is an interaction, it will be continued using the Tukey test (table 6) with a significance level of 0.05.

3. Results

Table 2. Descriptive results of pretest-posttest data on the level of choreography creativity

Treatment	Intelligence Level	Statistics	Pretest	Posttest	Improvement
Imagery Exercise with Audio	Low (L1k2)	Amount	522.2	582.2	60.0
		Mean	52.2	58.2	6.0
		Std.dev	12.2	9.9	-2.3
	High (L1k1)	Amount	556.7	613.3	56.6
		Mean	55.7	61.3	5.6
		Std.dev	5.7	6.0	0.3
Imagery Exercise with Audio Visual	Low (L2K2)	Amount	462.2	558.9	96.7
		Mean	46.2	55.9	9.7
		Std.dev	10.3	8.1	-2.2
	High (L2K1)	Amount	545.6	634.4	88.8
		Mean	54.6	63.4	8.8
		Std.dev	7.3	6.3	-1.0

According to the table and graph above, the pretest L1K2 mean value of 52.2 and the post-test value of 58.2 has increased by 6.0, the pretest L1K1 value of 55.7 and the post-test value of 61.3 has increased by 5.6, the pretest L2K2 mean value of 46.2 and the post-test value of 55.9 has increased by 9.7, and the pretest L2K1 score of 54.6 and the post-test score of 63.4 has increased by 8.8.

Table 3. ANOVA Test Results for Imagery Exercises with audio and audio-visual presentations

Source	Type III Sum of Squares	df	Mean Square	F	Sig
Imagery Exercise Method	.144	1	.144	.002	.961

According to the ANOVA test findings, the F value is 0.002 and the significance value is 0.961 > 0.05, indicating that it is not significant. In the first hypothesis with sound, there is a substantial difference in choreographic creativity between imaging exercises utilizing audio and audio-visual. As a result, it is conceivable to say that it is insignificant. Furthermore, the aerobic gymnastics instructor group that received imagery training with audio presentations increased by 11.6, while the group that received imagery exercises with audio visual presentations increased by 18.5. Thus, with a difference of 4.7, imaging exercises with audio visual presentations outperformed those with imagery audio exercise presentations.

Table 4. ANOVA Test Results Differences in High and Low Kinesthetic Intelligence on Choreographic Creativity

Source	Type III Sum of Squares	df	Mean Square	F	Sig
Kinesthetic Intelligence	284.089	1	284.089	4.766	0.036

Based on the ANOVA test and results that are shown above, the F value is 4.766 and the significance value is 0.036 < 0.05, indicating that there is a significant difference. In the second hypothesis with sound, there was a significant difference in choreographic creativity between aerobic gymnastics instructors with high and low kinesthetic intelligence. According to the data, gymnastics instructors with low kinesthetic intelligence have a 14.4 increase, whereas gymnastics instructors with high kinesthetic intelligence have a 15.7 increase. In other words, gymnastics instructors with high kinesthetic intelligence outperform those with low kinesthetic intelligence by a difference of 1.3.

Table 5. ANOVA Test Results on the Interaction of Audio and Audio Visual Imagery Exercises with Kinesthetic Intelligence (low and high) on choreographic creativity

Source	Type III Sum of Squares	df	Mean Square	F	Sig
Imagery Exercises *Kinesthetic Intelligence	49.284	1	49.284	0.827	0.369

Based on the ANOVA test results, the F value is 0.827 and the significance value is 0.369 > 0.05, indicating that there is no significant difference. In the third hypothesis that there is no significant interaction between sound and imagery exercises with audio and audio visual presentations with high and low intelligence on choreography creativity, it can be said to be accepted.

Table 6. Post Hoc Test Results

Group	Interaction	Mean Difference	Std. Error	Sig
L1K1	L1K2	-3.1100	3.45271	0.804
	L2K1	2.3400	3.45271	0.905
	L2K2	-5.2100	3.45271	0.443
L1K2	L1K1	3.1100	3.45271	0.804
	L2K1	5.4500	3.45271	0.403
	L2K2	-2.1000	3.45271	0.929
L2K1	L1K1	-2.3400	3.45271	0.905
	L1K2	-5.4500	3.45271	0.403
	L2K2	-7.5500	3.45271	0.146
L2K2	L1K1	5.2100	3.45271	0.443
	L1K2	2.1000	3.45271	0.929
	A2B1	7.5500	3.45271	0.146

A comparison between the L1K1 and L1K2 groups was discovered using the post hoc test. There was no difference in choreographic creativity between those with low kinesthetic intelligence (K1) and those with high kinesthetic intelligence (K2) in the group of gymnastics instructors who received imagery training with audio presentations (L1). This is evidenced by the value of sig 0.804 > 0.05. Regarding the comparison between the L1K1 and L2K1 groups, there is no difference in the choreography creativity between the audio presentation imagery exercise (L1) and the results of the audio visual presentation choreography creativity test (L2) in the instructor group who has low kinesthetic intelligence (K1) as demonstrated by the sig value of 0.905 > 0.05. In the comparison of the L1K2 and L2K2 groups, there was also no difference in the choreographic creativity between the audio presentation imagery exercise (L1) and the results of the audio visual presentation choreography creativity test (L2) in the gymnastics instructor group with high kinesthetic intelligence (K2) as evidenced by the sig 0.929 > 0.05. Similar results were also found in the comparison of the L2K1 and L2K2 groups where there was no difference in the results of choreographic creativity between low kinesthetic intelligence (K1) and those with high kinesthetic intelligence (K2). This finding is indicated by a sig value of 0.146 > 0.05

4. Discussion

An audio-visual exercise is a tool that can present

information through the senses of hearing and sight or a combination of the five senses. Information submission can be repeated and slowed down to clarify the movement in greater detail. The combination of audio and visual is capable of displaying events in progress, attracting one's attention to focus on the content being studied, overcoming visual restrictions, and stimulating and motivating gymnastics teachers' activities. Furthermore, gymnastics instructors are better equipped to understand flaws and rectify incorrect actions. According to Nanay [39], most people experience multisensory events as occurrences that a person perceives in more than one sensory modality, implying that multimodal mental imagery is a significant aspect of everyday activities. This is consistent with a prior study that used preoperative audiovisual education in its study, combining guided imagery based on the theory of health promotion model, and found that it had a substantial effect on anxiety [40]. In the sports approach to applying audio-visual learning in basketball, the audio-visual learning media shows positive changes so that students can understand basketball techniques [41], still in the sports approach to the application of imagery exercises using audio-visuals can improve skills in shooting accuracy in soccer players [42]. As a result of the findings, it is demonstrated that the group of gymnastics instructors who received audio-visual imagery training performed better than audio-imagery exercises; additionally, it has been demonstrated in several previous studies that learning or training by combining audio and visual had a positive impact.

Physical kinesthetic intelligence is a very significant sort of intelligence in sports, as defined as the capacity to employ natural senses to move the body properly [43] [44]. Kinesthetic intelligence is the ability to move one's body skillfully [45]. Kinesthetic intelligence is defined as an individual's capacity to utilize their body expertly and intelligently to express ideas, thoughts, and feelings, as well as operate well in handling and manipulating items [46].

Therefore, having competent kinesthetic intelligence is required in physical activities involving muscle, body, and skeletal movement. Kinesthetic intelligence refers to a person's capacity to communicate and solve problems by actively using part or all of their body [47]. Genetics or inheritance are the first factors that determine kinesthetic intelligence biologically, followed by personal life history, namely experience, friends, and the environment, and finally culturally and historically, where a person is born and nurtured in a different society and institution [48]. According to Mashkour and Hameed [45], basketball athletes who were given physical kinesthetic intelligence training were able to have a positive influence on the basic skills of playing basketball. Another study connected physical kinesthetic intelligence and managerial entrepreneurship revealed a significant relationship between the two variables, indicating that entrepreneurs with high physical kinesthetic intelligence can [49]. Thus,

kinesthetic intelligence is important in sports activities, particularly for gymnastics instructors. Of course, adequate kinesthetic intelligence is required; when aerobic gymnastics instructors have adequate kinesthetic intelligence, they are undoubtedly creative, innovative, and easy to apply. In line with previous studies, high kinesthetic intelligence certainly has a positive impact on physical education and sports health activities in practicing motion diversity [50].

5. Conclusions

Based on the findings and discussions, it is possible to infer that imaging exercises with audio and audio-visual presentations have a genuine influence on developing choreography creativity and that imagery exercises with audio-visual presentations are superior. Furthermore, there is a substantial difference in the effect of low and high kinesthetic intelligence on the results of the choreographic creativity test, with the high kinesthetic intelligence group outperforming the others. Furthermore, there is no substantial interaction between imagery training and kinesthetic intelligence on choreography creativity test scores. As a consequence, gymnastics instructors can utilize imaging exercises with audio-visual presentations to develop choreographing creativity, because the test shows that it improves gymnastics instructors with high and low kinesthetic intelligence. Kinesthetic intelligence affects enhancing creative test scores, implying that kinesthetic intelligence is vital in any sport involving body movement activities. Therefore, to actualize high choreographic creativity, it is required to carry out appropriate and suitable exercises so that optimal outcomes will be obtained.

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