The validity of numbered heads strategy test and its relationship to learning some rhythmic gymnastics skills for female students at the College of Physical Education and Sports Sciences

Hadeel Abedlelah Abedalhusen, College of Science, Al Nahrain University. Iraq Hadeel.a.a@nahrainuniv.iq

Abstract:

The study aimed at:

- Identify the validity of the numbered heads strategy test.
- Identify the relationship between the numbered heads strategy and learning some rhythmic gymnastics skills.

The researcher used a correlational approach with the descriptive method. One hundred female students from Tikrit University's College of Physical Education and Sports Sciences for the 2023–2024 academic year made up the research population. The sample, which included fifty second-year students, was purposefully chosen. The numbered heads strategy exam was used by the researcher to acquire rhythmic gymnastics skills. After dividing the sample into two groups and gathering data, the researcher employed statistical tools via the Statistical Package for Social Sciences (SPSS) to provide findings that supported the study's goals.

The researcher concluded with several findings:

- 1. The validity of the numbered heads strategy test was identified.
- 2. There is a significant correlation between the validity of the numbered heads strategy test and learning some rhythmic gymnastics skills.

Keywords: Heads Strategy, achievement, steps, performance

Introduction and Importance of Research:

The Numbered Heads Strategy is one of the modern teaching strategies that actively contribute to encouraging active learning among students and achieving satisfactory educational outcomes for the teacher, both in terms of student achievement and the smooth execution of the strategy steps. Additionally, it has a positive impact on the performance of the student in rhythmic gymnastics. This strategy is fundamentally based on dividing students into equal groups, with each group assigned a number. The members of each group also carry the same number, meaning the numbers are repeated across all groups. The group members put their heads together to confirm the accuracy of their answers to the question posed by the instructor. Then, the member with the assigned number presents the group's answer to the entire class.

Considering this, it can be said that this strategy involves numbering the students with numbers unknown to the instructor, which makes each student responsible for participating in the learning process. When their number is chosen, they are expected to answer questions, thereby ensuring more comprehensive involvement. This approach has garnered the attention of many researchers and educators, as it facilitates the learning process for skills or physical tasks in education, particularly in rhythmic gymnastics. Therefore, the implementation of this method to a group of students from the College of Physical Education and Sports Sciences is what makes this research important. For the first time in the field of learning, the researcher wants to ascertain the validity of this strategy's test.

Research Objectives:

- 1. To find the validity of the Numbered Heads Strategy test and its relationship to learning some rhythmic gymnastics skills.
- 2. To examine the relationship between the Numbered Heads Strategy and learning certain rhythmic gymnastics skills.

Research Hypotheses:

- 1. Students in the College of Physical Education and Sports Sciences showed statistically significant differences in their mastery of certain rhythmic gymnastics skills between their pre-test and post-test results.
- 2. Post-test results show statistically significant variations in the number of rhythmic gymnastics skills learned by the College of Physical Education and Sports Sciences students who used the Numbered Heads Strategy.

Research Domains:

- 1. **Human Domain**: A sample of students from Tikrit University's College of Physical Education and Sports Sciences for the 2023 school year.
- 2. **Time Domain**: From January 20, 2023, to April 23, 2023.
- 3. Spatial Domain: The hall designated for rhythmic gymnastics.

Research Procedures:

Research Method: Since the descriptive technique is the most dependable approach for addressing a variety of scientific problems in both practical and theoretical terms, the researcher employed it, which is suited for the nature of the study. The validity of the test and its connection to learning rhythmic gymnastics skills were evaluated using the pre-test and post-test.

Research Population: Students from Tikrit University's College of Physical Education and Sports Sciences in the 2023 academic year who were chosen using a purposive sample technique were considered the research population. These pupils participated actively in rhythmic gymnastics.

Research Sample: Fifty first-year students from the College of Physical Education and Sports Sciences were chosen at random to make up the research sample. Twenty-five students in the experimental group used the tactic, whereas twenty-five students in the control group used the conventional teaching approach. The sample was split into two equal groups.

Data Collection Sources and Equipment Used:

Data Sources:

- Arabic and foreign sources.
- A data registration form and its analysis.
- A questionnaire to survey specialists and experts to determine the most important skills in rhythmic gymnastics.

Equipment and Tools Used:

- 1. A Lenovo laptop.
- 2. Colored cards.

Research Implementation Procedures:

Numbered Heads Test: Numbered Heads is one of those strategies that put the student in an active and positive learning state. It provides the student with an opportunity to gain experience within a group, helping them master the required skill. However, this strategy has not received much application or research in the Republic of Iraq, with a scarcity of studies addressing its validity and objectivity. According to Al-Nahal (2016), the use of the Numbered Heads Strategy in teaching is essential because it fosters interaction, participation, and activity within the environment, and allows students to express their opinions and ideas about sports.

The strategy provides suitable educational situations for students, helping them practice skills independently. The teacher divides the class into groups, each containing 4-6 students, and assigns each student a specific number. After the teacher explains a certain skill, the students are given time to think and write down their answers. Then, members of the same group discuss agreeing on a unified answer. The teacher randomly selects a number, and the student with that number from each group presents the group's answer to the entire class.

Tests Prepared for Research: To collect unbiased data and information that would help accomplish the study's objectives, the researcher created a questionnaire and distributed it to experts and professionals. The purpose of the questionnaire was to determine which rhythmic gymnastics skills were most crucial for the study's sample. The skills selected for this study are displayed in Table 1.

Table 1 Basic Skills Recommended for Rhythmic Gymnastics

Percentage	Number of Repetitions	Basic Skills	Sequence
100%	5	Step leap (extended)	11

80%	4	Step leap (flexed extended)	2
90%	3	Scissors leap	3

Scientific Foundations of the Tests:

Validity of the Tests: The researcher computed the validity, reliability, and objectivity coefficients to establish the tests' scientific foundation. To assess the validity of the test being studied, the researcher used content validity. A sample of 10 first-year students, who represented the research population, were given the exam again to evaluate its reliability. Seven days later, the same group took the test again.

In the words of Adams (1964), "the time interval between the first and second administration of the tool should not exceed two or three weeks." The reliability coefficient between the first and second test applications was 0.80, which is regarded as a good reliability coefficient for physical education research, according to the simple Pearson correlation coefficient. According to the common scale for evaluating the correlation's significance (Alsheikh & Jaber, 1964), this coefficient is considered satisfactory, especially when utilizing measurement instruments for study.

As a result of this procedure, the tests are now ready for application on the sample of students involved in the research.

Test Name	First Test (X-)	First Test (S-)	Second Test (X-)	Second Test (S-)	Correlation Coefficient (r)
Step Jump Test (Straight)	1.3	8.1	1.6	8.3	0.80
Step Jump Test (Bent)	1.8	2.7	1.7	3.4	0.83
Scissor Jump Test	1.2	4.1	0.9	4.2	0.90

Discriminative Validity:

Validity is considered one of the essential psychometric properties of tests and measurements. It refers to how useful measurements are in making appropriate decisions for a specific purpose (Alam, 2000:210). One of the features of a good scale is its ability to distinguish between individuals who achieve high scores and those who achieve low scores on the same scale, meaning it extracts the discriminative power of the items, as well as having internal consistency between the items. This process is an appropriate means to ensure the validity of the scale, which is one of the essential characteristics that must be available in the tool. As stated by Jaber and Kazem (1973:276), "A valid tool is one that measures what it is designed to measure."

Abel noted that "The best way to verify apparent validity is for a number of experts to estimate the extent to which the items represent the attribute being measured" (Al-Zubaidi et al., 1981:39).

The statistical analysis was conducted using two methods:

1. Extreme Group Method: The extreme group method was used to identify the distinguishing items in the evaluation scale for the female students. Typically, 27% of the highest and lowest scores are selected to represent the extreme groups. However, due to the small size of the sample (50 female students from the College of Physical Education and Sports Science), and the difficulty of selecting the top 27% and bottom 27%, the researcher opted to divide the sample into two equal parts: higher and lower groups. This approach was also followed by Al-Zubaidi et al. (1981), Hamdani (2002), and Ashrafi (2002). It was not critical to adhere to the 27% criterion. The researcher selected 50% from both the highest and lowest scores to represent the extreme groups, with each group containing twenty-five students after arranging their scores in descending order based on their responses to the items in the scale.

Main Tests: After extracting the scientific basis for the tests and ensuring the integrity of their procedures regarding scientific conditions and specifications, and their suitability for the research sample (first-year students at the College of Physical Education and Sports Science), the researcher applied the pre-test and posttest skills assessments to the research sample (50 students) on Monday, 26/2/2023 at 10 AM.

- 2. Data Analysis Method: Mean scores and standard deviations for the study's pre-test and post-test
- outcomes were among the statistical tools the researcher extracted using the Statistical Methods Kit. **Results and Discussion:**

Table (3) displays the pre-test and post-test findings for the research sample.

Table (3): The pre-test and post-test findings' mean values, standard deviations, t-values, and significance levels (sig) are displayed in this table.

No.	Variables	Pre-test (Mean ± SD)	Post-test (Mean ± SD)	t-value	Significance Level (sig)
1	Step Leap (Extended)	3.500 ± 1.073	6.240 ± 1.152	12.400	0.000
2	Step Leap (Bended & Extended)	3.540 ± 0.973	5.820 ± 1.189	11.513	0.000
3	Scissor Leap	2.860 ± 0.989	5.960 ± 1.261	17.543	0.000

The significance level (sig) is considered significant if it is less than 0.05.

The statistical differences between the pre-test and post-test are significant in favor of the post-test, indicating the validity of the numbered heads strategy in improving the students' performance. This aligns with the views expressed by Osama Kamel Rateb (1990), Mahmoud Abdel-Fattah Anan (1995), and Mohamed Hassan Alawi (1998), who emphasized that students with high achievement motivation tend to focus on excellence and success for the sake of excellence itself. They set well-defined goals characterized by calculated risks and focus on long-term future goals. These students possess high internal motivation and self-confidence, learn more quickly compared to others, perform efficiently, correct mistakes, and show significant perseverance in improving performance. They also exhibit specific skill qualities and performance during training and competition, showing an elevated level of achievement.

Arabic and Foreign References:

- Suhad Fakhri Al-Nahal (2016): The Impact of the Use of Numbered Heads Strategy on Developing Communication Skills and Achievement Motivation in Mathematics Among Seventh-Grade Female Students in Gaza. Unpublished master's Thesis, Gaza: Islamic University.
- Osama Kamel Rateb (1990): Motivation for Success in Sports Activities, Cairo: Arab Thought House.
- Salahuddin Mahmoud Alam (2000): Educational and Psychological Measurement and Evaluation (Basics, Applications, and Contemporary Trends), 1st Edition, Arab Thought House, Cairo, Egypt.
- Abdul Jalil Ibrahim Al-Zoubi et al. (1981): Psychological Tests and Scales, Printing and Publishing House, University of Mosul, Mosul, Iraq.
- Jaber Abdul Hamid Jaber & Ahmed Khairy Kazem (1973): Research Methods in Education and Psychology, Al-Nahda Arab House, Cairo, Egypt.
- Benjamin Bloom et al. (1983): Evaluating Student Learning (Summative and Formative), Translated by: Mohamed Amin Al-Mufti et al., Egyptian Modern Printing Press, Cairo, Egypt.
- Yusuf Sheikh & Jaber Abdul Hamid Jaber (1964): Psychology of Individual Differences, Al-Nahda Arab House, Cairo, Egypt.
- Mahmoud Abdel-Fattah Anan (1995): Psychology of Physical Education and Sports: Theory and Application (Experimental), Cairo: Arab Thought House.
- Mohamed Hassan Alawi (1998): Encyclopedia of Psychological Tests for Athletes, Cairo: Book Center for Publishing.
- Adams, Georgia Cacho (1964): Measurement and Evaluation in Educational Psychology and Guidance, Holt, New York.