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ORIGINAL ARTICLE

Designing and Standardizing a Test to Measure Motor Creativity Abilities of the Arm and Leg with the Assistance of Artificial Intelligence for Specialized School Male Athletes

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ABSTRACT
Background. The study explores the potential of integrating artificial intelligence (AI) into developing and standardizing tests designed to measure motor creativity. This research is motivated by the need to enhance the precision and reliability of assessments in physical education through advanced technological tools. **Objectives.** The primary objective is to construct and validate AI-assisted tests specifically targeting the motor creativity of the arms and legs among specialized sports school athletes. Additionally, the study aims to establish normative data that can be used to standardize these tests for broader applications. **Methods.** A descriptive methodology was employed, involving 45 athletes for the initial test construction and 278 for the subsequent standardization phase. The tests, developed with AI support, were subjected to rigorous validation processes, including reliability and objectivity assessments. **Results.** The findings confirm that the AI-assisted motor creativity tests are both reliable and valid. The tests meet the scientific criteria necessary for standardized assessments, demonstrating strong concurrent and discriminant validity. **Conclusion.** The study recommends adopting AI-assisted tests for evaluating motor creativity in sports settings. It also suggests regular reviews and updates to the tests to maintain their relevance and accuracy in different populations.

INTRODUCTION

The continuous search for scientific methods and effective strategies in sustained research aims to achieve optimal results. These results are not attained through outdated approaches but through advancing knowledge and applied creativity, which involves innovative and appropriate actions. This process relies on several dimensions, notably Originality, Flexibility, and Fluency, which are effectively utilized across various fields, particularly sports. When linked to movement, these dimensions result in motor creativity (1).

With the rapid development across various fields, beginning with the Industrial Revolution and progressing to multi-media smart devices with digital technology features, every aspect of life, including sports, has benefited. The sports sector is keen to keep pace with the times through technical intelligence and leveraging these features to achieve excellence and the best possible accomplishments. This balance caters to both societal needs and individual requirements (2).

Artificial intelligence (AI) simulates human intelligence technologically, interacting with electronic systems to produce a set of characteristics linked to human behavioral intelligence (3). It involves computer processing that provides various information to create models for solving problems through a digital simulation of knowledge related to human behavior, connecting it with science and data for practical application across various fields (4).

AI connects humans with smart devices, enabling immediate activation of learning methods and extensive information storage and retrieval, thereby enhancing human memory and rapidly disseminating information. This capability presents AI as a practical application offering a new perspective, leveraging historical technical knowledge as an interactive virtual reality to provide support at any time (5).

AI is categorized into two types: narrow AI, which performs specific tasks such as intelligent self-driving cars, and general AI, which processes vast amounts of knowledge and data to simulate human intelligence. This assists humans in performing tasks quickly and accurately, solving problems with high precision (6). The advantages of AI include its high capability in data analysis, problem-solving accuracy, and the provision of appropriate immediate information according to situations. This results in competent decision-making and efficient time management for flexibly addressing various issues. However, AI has negative aspects that should not be overlooked. These include the potential for providing inaccurate, misleading information, leading to severe consequences and contributing to job displacement, thereby increasing unemployment rates as computers replace human tasks (7).

AI has not yet achieved perfection in scientific research applications due to economic and human reasons, limited data, complex algorithms, and insufficient collaboration between technology engineers and educational institutions (8). The researcher believes that advanced methods leveraging AI and smart devices will save time and effort, achieving the most accurate results through interactive scientific methods and merging intelligence with creativity for effective motor achievement in physical education and sports (9).

A study designed tests to measure the creative and motor originality abilities of Iraqi children aged 8-12, standardizing them by establishing normative scores and levels (10). This study utilized a descriptive methodology with a sample of 96 for construction and 440 for standardization, concluding that the designed tests effectively evaluated creative abilities, with normative scores representing the sample's capabilities (11).

Another study aimed to develop and standardize tests for general and specific creative abilities among high school girls. The study found that the designed tests were suitable for measuring creative abilities, using a descriptive methodology on a sample of 180 for construction and 320 for standardization, with normative scores representing the true capabilities of the sample (12).

A recent study adapted traditional assessments using AI, designing computer-based tests to evaluate human skills. This descriptive study concluded that AI provides partial solutions to traditional assessments, presenting challenges and opportunities for improving evaluation practices (13).

Swiecki (14) aimed to validate AI-related assessments of basic child movements using a descriptive methodology, reviewing 672 studies. The study concluded that previous assessments of child movements had not integrated AI techniques and diagnostic criteria to assist in the accuracy of AI standard evaluations, validating 12 assessments related to developmental accuracy (9).

Previous studies have designed and standardized tests for creative abilities with normative criteria. They confirmed the validity of basic skill assessments for students using AI calibration. This study stands out by designing AI-assisted motor creativity tests and establishing highly accurate normative scores through innovative digital technology (15).

The current research emphasizes the importance of creative methods, including motor creativity, leveraging AI benefits for researchers in various disciplines, including measurement and evaluation, aiming to develop innovative, standardized tests for accurate assessment and evaluation.

The researchers' question for objective investigation is whether it is possible to specialize in creativity, focusing on its measurement and evaluation in physical education and sports, by designing AI-assisted motor creativity tests and validating their scientific criteria on specialized sports school athletes.

Finally, the current research seeks to achieve several objectives, which can be represented as follows:

- Design and develop tests to measure motor creativity abilities of the arm and leg with AI assistance for specialized sports school athletes.
- Standardize these tests using multiple normative scores.

MATERIALS AND METHODS

Research Design. The researchers employed a descriptive methodology, deemed most appropriate for implementing the procedures, achieving accurate results, and fulfilling the research objectives.

Research Samples. The research used a purposive sampling technique to conduct their study, involving several specialized sports school athletes in Ramadi. The total sample size was 278 athletes, with 8 participants in the preliminary experiment, 45 in the construction experiment, and 225 in the standardization process. These participants possessed statistical characteristics with averages of 14 years in age, 152 cm in height, and 48 kg in weight, representing the general description of the construction experiment sample for the designed tests As explained in Table 1.

Field Research Procedures. The initial design for the motor creativity tests, assisted by artificial intelligence, included detailed information about motor creativity. This encompassed naming the test, stating its objective, listing the necessary tools, describing the performance method, and explaining the registration process. The preliminary experiment was conducted on February 8, 2023, at 5 PM, with the assistance of specialized sports school coaches acting as an auxiliary team, involving 8 athletes to test the designed motor creativity capabilities.

The initial format for the Creative Motor Fluency Test involved rolling a handball twice experimentally from a starting line to a marked line 5 meters away, with lines set at intervals of 50 cm before and after the marked line across four zones. The performance was directed forward only. The measurement and recording of tennis ball push for ten seconds were followed by basketball pushes for another ten seconds, each with a single attempt. The accuracy of these pushes in one direction was recorded by summing the accuracy of the tennis ball, and basketball pushes over two trials, yielding the score for creative motor fluency.

Upon completing the fluency test, the athlete proceeded to the Creative Motor Flexibility Test. This test involved rolling a handball backward twice experimentally, then measuring the rolling of tennis and basketballs backward once for ten seconds over a distance of 5 meters, then rolling the balls forward once again for ten seconds. This provided a varied and flexible creative performance in two different directions for motor flexibility. Subsequently, the athlete pushed the tennis and basketballs to the right side once for ten seconds over 5 meters and similarly to the left side without any experimental attempt. This resulted in an unusual creative motor behavior within a specified timeframe for creative motor originality. It was noted that a two-second interval was required between each performance and a three-second interval when transitioning from one capability to another, adjusting the performance duration from the initially proposed ten seconds to five seconds (16).

Table 1. Specifications of the construction sample (arm*, leg) in the designed test and criterion-referenced test.**

Sample Size	Arithmetic Mean	Median	Mode	Standard Deviation	Coefficient of Variation	Skewness	Minimum Value	Maximum Value
45*	93.2	91	94	21.87	23.46	0.754	54	151
45**	86.4	84	89	19.04	22.03	0.975	54	144
45*	94	95	93	25.74	27.83	0.171	30	165
45**	92.5	94	95	20.03	25.96	0.016	32	152
45*	60.13	61	62	13.61	22.65	0.282	35	83
45**	59.36	61	62	13.73	23.14	0.22	34	82

Research Tests.

1) Test Validity. After correcting the test, the validity was verified by eleven experts (17). The motor creativity test for the arm received a score of 47, and the motor creativity test for the leg received a score of 41 out of a total of 55 points for the five alternative answers. This resulted in an agreement percentage of 85.45% and 81.81%, respectively. Therefore, the designed tests demonstrated expert validity, as their results exceeded the critical values according to the Al-Jubouri (18) table of critical values, which is 0.59 for eleven experts.

On February 11, the concurrent validity of the designed tests was verified against an external criterion test (19). Additionally, an index of validity was established through the discriminatory power in the designed motor creativity tests for both the arm and leg, as illustrated in Tables 2 and 3.

The test demonstrates concurrent validity with the external criterion, as indicated by the significant and strong correlation between the arm motor creativity test and an acceptable correlation for the leg motor creativity test. Both calculated values exceed the tabular value of 0.294. Additionally, the indicator confirming the strength of the relationship is the significant difference between the values of the designed and criterion tests, as their calculated t-values are greater than the tabular t-value of 2.015 (9).

The test for arm motor creativity exhibits significant discriminatory power when compared to the tabular value of 2.048. This is due to the difference in means of 50.133 and the difference in standard deviations of 5.283, indicating the test's strong statistical significance and confirmatory validity. Similarly, the leg motor creativity test shows significant discriminatory power with a calculated value exceeding the tabular value, given a mean difference of 37.933 and a standard deviation difference of 4.758, further confirming the validity of both tests (15).

Table 2. Concurrent validity of the designed motor creativity test for the arm and leg with the criterion.

Variables	Sample Size	Degrees of Freedom	Unit of Measurement	Correlation Coefficient	T-Test	Tabular Correlation	Tabular T-Value
Arm Creativity	45	43	Score	0.746	7.345	0.294	2.015
Leg Creativity	45	43	Score	0.677	6.039		

Table 3. Discriminant validity of the designed motor creativity test for the arm and leg.

Variables	Sample Size	Degrees of Freedom	Unit of Measurement	Mean of Minimum Values	Mean of Maximum Values	Calculated T-Value	Calculated Cohen's d
Arm Creativity	30	28	Score	70.53	120.67	9.49	3.465
Leg Creativity	30	28	Score	68.8	106.7	7.973	2.911

2) Test Reliability. After validating the test, the researcher re-administered the designed motor creativity test on Thursday, February 15, to reassess the overall score and its reliability coefficient. The correlation result for arm creativity was 0.831, indicating a strong correlation and significant reliability at a degree of freedom of 43 and an error level of 0.05, compared against the tabular R-value of 0.294. On the other hand, the correlation strength for leg creativity was acceptable, with significant reliability at a degree of freedom of 43 and an error level of 0.05, which was also compared against the tabular R-value of 0.294.

Upon confirming the consistency of the overall test score and its re-administration, the researcher further verified the consistency of the test components with the overall score. This was done through internal consistency analysis of the motor creativity abilities (Originality, Flexibility, Fluency) for both arm and leg creativity, with the results presented in Table 4.

Internal consistency is very strong for the arm's creative fluency ability, with a correlation of 0.882 and a mean of 45. Consistency is also strong for the creative flexibility of the arms, with a correlation of 0.789 and a mean of 28. The internal consistency for the creative originality of the arm is acceptable, with a correlation of 0.675 and a mean of 20. For the leg, the internal consistency for fluency is strong, with a correlation of 0.789, while the consistency for Flexibility and Originality is acceptable, with correlations of 0.630 and 0.684 and means of 23 and 19, respectively. This reinforces the concept of consistency in the reliability of the designed test through strong internal consistency between the overall score and the scores of all components, indicating significant reliability for the creative motor abilities, as illustrated in Figure 1.

The test's practicality, based on mutual understanding, is achieved by unifying the detailed instructions in the final format of the test. Additionally, the measurement and recording grades rely on digital technology processed electronically through a statistical assistant program installed on multi-use smart devices, ensuring precise and uniform extraction that guarantees the objectivity of the designed test. It is essential to write the test objectively and present it in its final format as follows:

- Name of the Test: AI-Adapted Motor Creativity Test.
- Objective of the Test: To measure the combined degree of fluency, flexibility, and originality in arm motor creativity using the same procedures applied to the leg motor creativity test.
- Test Tools: 4 handballs, 12 tennis balls, 12 basketballs, a stopwatch, a 10-meter diameter square drawn on the ground with a center point marked by a (+) sign, the square's final boundaries marked with a width of half a meter worth 5 points. From the center, a 2-meter line extends outward and inward, divided into zones with a diameter of 50 cm each. Additionally, areas are marked by a 5 cm wide line, half a meter away from the final boundary at the top and bottom, worth 4 points. Another zone with the same dimensions is worth 3 points, followed by another worth 2 points, and finally one worth 1 point.
- Test Procedures:
  - o Use the preferred arm to roll a handball forward twice as a trial attempt.
  - o Transition to actual attempts by rolling as many tennis balls forward as possible within 5 seconds to reach the highest score.
  - o Perform the same action with a basketball for 5 seconds (repeated twice) to measure the creative motor fluency of the arm for performance accuracy within a specified time.
  - o Roll the handball forward once and backward once as trial attempts.
  - o Perform the actual test by rolling tennis balls backward for 5 seconds and then forward for 5 seconds.
  - o Push a basketball backward once for 5 seconds and forward once for 5 seconds to measure the motor flexibility creativity of the arm in different directions within a specified time.
  - o Finally, roll the tennis ball to the right once and to the left once, and do the same with the basketball to measure the creative motor originality of the arm through unconventional movements within a specified time.
  - o Note: The same procedure mentioned above is applied for leg motor creativity.
- Scoring Method:
  - o 5 points are awarded when the ball reaches the final boundary of half a meter in width or touches any part of it.
  - o 4 points are awarded for the next area above and below.
  - o 3 points are awarded for the fourth area above or below.
  - o 2 points are awarded for the area following the third above or below.
  - o 1 point is awarded for the area following the second above or below.
  - o No points are awarded outside the area of one point.
  - o The score of the largest part is counted if the ball touches any part of it.
  - o Finally, the results of Fluency, Flexibility, and Originality for the arm movement are combined to give the total score for arm motor creativity, and the same applies to the leg.

It is important to note that :

- o The test is conducted by rolling the ball from the center of the square and pushing it by hand for fluency forward, flexibility forward and backward, and originality to the right and left as many times as possible within 5 seconds.
- o Then, transition to the second test with the same procedures and measurements illustrated in Figure 2, rolling the ball and hitting it with the leg for forward creative fluency, forward and backward creative flexibility, and right and left creative originality.

The first research objective is achieved after ensuring the validity of the scientific foundations for constructing the test, which demonstrated expert validity, concurrent validity, and discriminatory validity, as well as test reliability and internal consistency.

Finally, the researcher utilized the Statistical Assistant Program, including percentage statistics, T-test, Cohen's d, mean, median, mode, standard deviation, variation, skewness, sample size, Pearson's correlation coefficient, reliability coefficient, and standardized scores (z-scores, t-scores, and adjusted percentiles).

Table 4. Internal consistency between the overall test score and its abilities (fluency, flexibility, originality).

Variable Name	Unit of Measurement	(R) for fluency	(R) for flexibility	(R) for originality	Tabular (R)	Significance
Overall, for Arm	Score	0.882	0.789	0.675	0.294	Significant
Overall, for Leg	Score	0.789	0.630	0.684	0.294	Significant

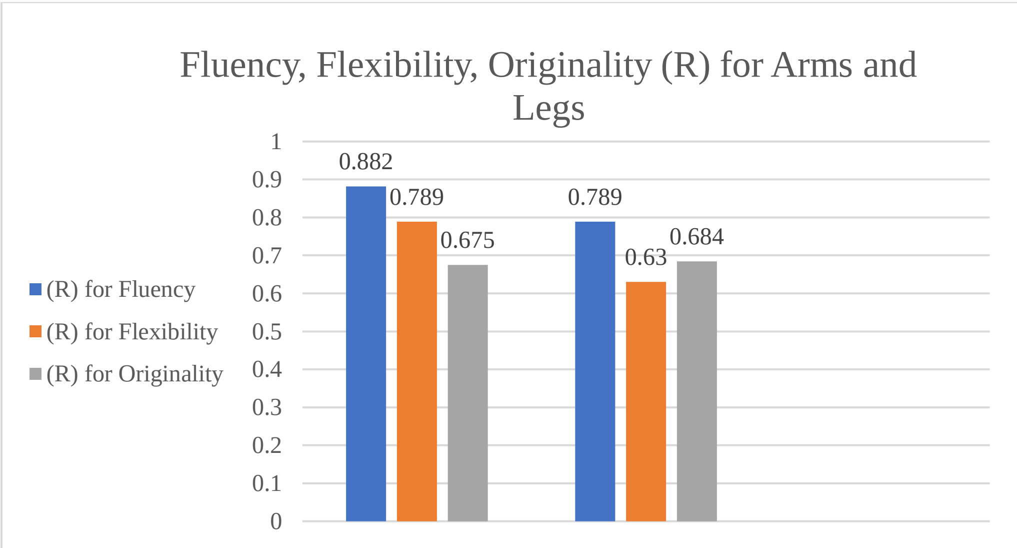

Figure 1. Illustrates the internal consistency scores for motor creativity abilities.

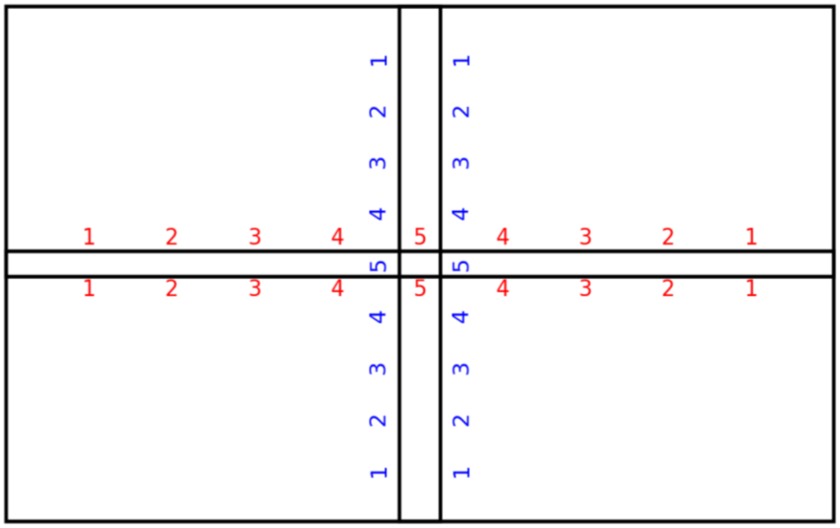

Figure 2. Illustrates the performance square and the scoring grades.

RESULTS

The specifications and criteria of the standardization sample for both arm and leg creative movements are presented As in Table 5.

After verifying the scientific criteria for a good test, standardization was conducted from February 15 to April 30 on a scientifically determined sample of 225 athletes. The sample size was calculated with the assistance of artificial intelligence technologies using the Chat GPT program, which indicated that the research sample should not be less than 218 individuals from the total population. This was corroborated by the program (calc-web.net), relying on the most well-known formulas for calculating appropriate sample size in scientific research, including the following formulas: "{Sample size determined = (standard score^2 × standard deviation × (1 - standard deviation) ÷ (margin of error)^2}", "{Sample size undetermined = (population variance × (critical value of the normal distribution)^2) ÷ (allowable error)^2}" (https://calc-web.net).

Regarding the standards, raw scores alone do not suffice to interpret test results, making it imperative to use standardized scores, especially since their interpretation is based on the normal distribution from (+3 to -3) for Z-scores. Z-scores convert raw scores into a standard score with a mean of zero and a standard deviation of one, according to the statistical formula: (raw score - mean) ÷ standard deviation (20).

Z-scores help convert raw scores for motor creativity, whether for the arm or leg, and these scores can be interpreted according to the characteristics of the normal distribution. However, Z-scores have the drawback of including negative scores and the potential misinterpretation of zero as their mean. This highlights the importance of adjusting them to T-scores ranging from 20 to 80, with a mean of 50.

T-scores are an adjusted standard score derived from the Z-score by multiplying it by ten and then adding fifty. This conversion provides objective results by transforming raw scores into a clearly interpretable standard form without negative values and with a mean of fifty, facilitating the evaluation of actual performance (21).

Standardization involves controlling variables and procedures, unifying the registration score, and then evaluating it according to specific standard levels 5. The T-score does not record standard scores beyond 20, and 80 which can be addressed using an adjusted percentile rank calculated as (raw score × 50) ÷ mean. This gives a score ranging from zero to one hundred as a complete standard. Percentiles divide the distribution into one hundred equal parts corresponding to a certain percentage of individuals representing their ascending order (22).

Creativity, in its entirety, is an attribute of the Creator who endowed humanity with traits that encompass ingenuity, which individuals can exploit in their innovations and imaginations across various life domains, whether intellectual, aesthetic, or physical. Motor creativity is a type of movement skill manifested in motor responses that reflect an individual's abilities and dexterity, with the capacity to perform movements characterized by Fluency, Flexibility, and high proficiency in originality (23).

It is also defined as the ability to produce the largest number of new motor responses, effectively performing motor tasks (24). Detecting problems and recognizing gaps and deficiencies pertains to cognitive creativity, involving coordination between information and missing elements, then searching for alternatives and indicators that fit the situation after proposing appropriate solutions (18).

Motor creativity has several components, the most important being motor fluency, which refers to an individual's ability to produce as many motor responses as possible to a stimulus within a specified time. It also includes motor flexibility, the ability to change and diversify movements from one motor behavior to another that is appropriate to the stimulus from various angles and directions (25). Motor originality refers to producing rare, infrequent, and unconventional motor behaviors highly appropriate to the stimulus (13).

Sensitivity to problems is a major component of motor creativity, a creative thinking skill, meaning the ability to perceive latent weaknesses and recognize problems in a given situation (26). This aspect was not addressed due to its unsuitability for the practical research path, focusing instead on creative abilities performed by the leg and arm, including Fluency, Flexibility, and Originality, culminating in a final score for motor creativity (27).

Other components of creativity and motor creativity identified by the AI program (Microsoft

Copilot) include innovation, imagination, visualization, transformation, detail, thinking, intuition, frequent questioning, aesthetic sense, tendency toward complexity, problem definition, information analysis, classification, information gathering, evaluation, planning, and inference. These components were noted as research findings from artificial intelligence, even though three abilities were chosen whose scores collectively represent motor creativity for the arm and leg (28).

The completion of adapting the motor creativity test with the assistance of artificial intelligence and its standardization by converting raw scores into multiple standard scores, including Z-scores, T-scores, and percentile ranks, achieves the second research objective of standardizing the designed test for motor creativity of the arm and leg (29).

Table 5. Z-scores, T-scores, and percentile ranks for the arm motor creativity test.

No.	Raw Score	Z-Score	T-Score	Percentile Rank
1	169	2.91375	79.1375	89.893
2	164	2.7195	77.195	87.233
3	154	2.331	73.31	81.914
4	144	1.9425	69.425	76.595
5	134	1.554	65.54	71.276
6	124	1.1655	61.655	65.957
7	114	0.777	57.77	60.638
8	104	0.3885	53.885	55.319
9	94	0.0000	50	50
10	84	-0.3885	46.115	44.681
11	74	-0.777	42.23	39.362
12	64	-1.1655	38.345	34.043
13	54	-1.554	34.46	28.724
14	44	-1.9425	30.575	23.405
15	34	-2.331	26.69	18.086
16	24	-2.7195	22.805	12.767
17	19	-2.91375	20.8625	10.107
18	162.5	—	—	87.838
19	152.5	2.996	79.96	82.432
20	142.5	2.496	74.96	77.027
21	132.5	1.997	69.97	71.622
22	122.5	1.498	64.98	66.216
23	112.5	0.999	59.99	60.811
24	102.5	0.444	54.49	55.405
25	92.5	0.000	50	50
26	82.5	-0.449	45.51	44.595
27	72.5	-0.999	40.01	39.189
28	62.5	-1.498	35.02	33.784
29	52.5	-1.997	30.03	28.378
30	42.5	-2.496	25.04	22.973
31	32.5	-2.996	20.04	17.568
32	22.5	—	—	12.162

DISCUSSION

Creativity, in its entirety, is an attribute of the Creator, who endowed humanity with traits that encompass ingenuity, allowing individuals to harness these qualities in various domains of life—whether intellectual, aesthetic, or even physical (30). Motor creativity, in particular, is a form of movement skill manifested in motor responses that reflect an individual's abilities and dexterity, characterized by the capacity to perform movements with high Fluency, Flexibility, and Originality (31).

Moreover, motor creativity is considered the ability to generate the largest possible number of new motor responses with high efficiency in executing motor tasks (32). The cognitive aspect of creativity involves problem sensitivity, recognizing gaps and deficiencies, and finding coordination between information and missing elements, followed by searching for suitable alternatives and indicators for the situation after proposing appropriate solutions (33).

Motor creativity comprises several components, most notably motor fluency, which refers to the ability of an individual to produce the maximum number of motor responses to a stimulus within a specified period. It also includes motor flexibility, the ability to vary and transition from one motor behavioral state to another in response to a stimulus involving multiple angles and directions. Additionally, motor originality is the capacity to perform and produce rare, infrequently repeated motor behavior uncommon among group members and highly suitable to the stimulus (12).

Sensitivity to problems is also a key component of motor creativity, regarded as a creative thinking skill, meaning the ability to perceive latent weaknesses and recognize problems within a given situation (34). This aspect was not addressed in the practical course of the research, as the focus was on the creative abilities performed by the arms and legs, including Fluency, Flexibility, and Originality, culminating in the overall outcome of motor creativity (27).

Other components of creativity and motor creativity have been identified through artificial intelligence, specifically by the Microsoft Copilot program, such as innovation, imagination, visualization, transformation, detail orientation, thinking, intuition, inquiry, aesthetic sensitivity, complexity preference, problem definition, information analysis, classification, data collection, evaluation, planning, and inference. These components were referenced as AI-generated research outcomes, although three core abilities were selected to aggregate scores representing motor creativity in the arms and legs (28).

The successful adaptation and standardization of the motor creativity test with the assistance of artificial intelligence, through converting raw scores into various standardized scores—such as z-scores, t-scores, and percentiles—fulfills the second objective of the research by standardizing the test designed for motor creativity of the arms and legs (35).

CONCLUSION

This study demonstrates the significant potential of artificial intelligence in enhancing scientific research within physical education and sports, particularly in developing and standardizing motor creativity tests. The AI-assisted test created for this research proves to be scientifically robust, meeting crucial criteria such as validity, reliability, and objectivity. It strongly aligns with external standards and exhibits solid statistical foundations. Moving forward, it is recommended further to integrate AI and modern technologies in sports research, adopt and regularly validate the designed tests, explore additional validity indicators, and establish precise standards for diverse groups. Continued research on motor creativity and its components using appropriate samples is encouraged to advance our understanding in this field.

APPLICABLE REMARKS

- Integration of AI in Sports Research: The successful use of AI in developing and standardizing the motor creativity test underscores the potential for broader AI integration in sports science research. Researchers and institutions should consider incorporating AI tools to enhance efficiency and accuracy in various aspects of sports studies.
- Continuous Validation and Updating: While the developed test shows strong validity and reliability, it is crucial to establish a protocol for regular reassessment, perhaps every 3-5 years. This ensures that the test remains relevant and accurate as the field evolves.
- Customization for Different Sports: The principles and methodologies used in this study could be adapted to create specialized motor creativity tests for different sports or athletic disciplines, allowing for more targeted assessment and training.
- Practical Implementation in Training Programs: Coaches and physical education instructors should consider incorporating these AI-assisted motor creativity tests into their regular assessment routines. This can provide valuable insights into athletes' creative motor abilities and help tailor training programs accordingly.
- Interdisciplinary Collaboration: The success of this AI-assisted approach suggests potential benefits in fostering collaborations between sports scientists, AI specialists, and data analysts to further innovate in sports research and assessment methodologies.

- Ethical Considerations: As AI becomes more prevalent in sports assessment, it is important to establish clear guidelines for its use, ensuring fairness, transparency, and privacy in applying these technologies.
- Educational Applications: The findings of this study could inform curriculum development in physical education programs, emphasizing the importance of motor creativity alongside traditional physical skills.

AUTHORS' CONTRIBUTIONS

Study concept and design: Shakir Mahmood Abdullah. Acquisition of data: Laith Mohamed Abdel-Razzaq. Analysis and interpretation of data: Ahmed Hisham Ahmed. Drafting the manuscript: Khaleel Setar Mohammed. Critical revision of the manuscript for important intellectual content: Khaleel Setar Mohammed. Statistical analysis: Ahmed Hisham Ahmed. Administrative, technical, and material support: Mohannad Salman Dawood. Study supervision: Shakir Mahmood Abdullah.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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ETHICAL CONSIDERATION

This work complies with the applicable guidelines for scientific research and human service as recommended by the Ethics Committee for Higher Education.

ROLE OF THE SPONSOR

The authors declare that they have no sponsors.

ARTIFICIAL INTELLIGENCE (AI) USE

AI helps a task to assist in designing a creativity motor test for study and also developing research and learning information and proposals for measurement and evaluation.

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