Proximus Journal of Sports Science and Physical Education
Volume 2, Issue 11, November, 2025
https://proximusjournal.com/index.php/PJSSPE
ISSN (E): 2942-9943

DESIGNING AN ACHIEVEMENT TEST TO MEASURE THE LEVEL OF SKILL AND COGNITIVE PERFORMANCE IN WRESTLING FOR STUDENTS OF THE COLLEGE OF PHYSICAL EDUCATION AND SPORT SCIENCES

Farazdaq A. Hamdan
University of Misan, College of Physical Education and Sports Sciences
farazdaq@uomisan.edu.iq

Abstract
This research aims to design tests to measure skill and cognitive performance in wrestling. A descriptive approach was adopted, using survey and correlation techniques, given its suitability to the nature of the research problem. The research population included all 30 third-year students in the College of Physical Education and Sports Sciences at the University of Misan. A comprehensive enumeration method was used to determine this sample for the academic year 2023-2024. The researcher used the statistical package SPSS-24. The study concluded that the tests for measuring skill and cognitive performance in wrestling are characterized by their ease of application and low cost, in addition to not requiring the use of many devices or tools. They also efficiently measure the purposes for which they were designed, enabling teachers to accurately evaluate students. The study recommended the importance of adopting these tests in evaluating students in colleges of physical education and sports sciences. It also emphasized the need to conduct similar studies on larger samples or in other fields related to wrestling and sports in general.
Keywords : Designing, Achievement Test, Measure, Cognitive Performance, Wrestling.

Introduction

Different disciplines, including scientists and researchers, are pivotal tools for serving society through their work and studies (Andrew, Pedersen & McEvoy, 2019). However, the effectiveness and merit of these efforts and actions require careful studies and analyses to assess the results achieved and the extent to which the desired objectives have been achieved (Hughes et al., 2019). Therefore, it is necessary to rely on systematic and comprehensive tests and measurements, as they play a key role in evaluating performance and correcting its course in various fields of life and science (Al Behadili & Kasim, 2022 ; Williams & Lacy, 2018). Through this process, the level of progress made can be determined and the positive and negative aspects of any effort made by an individual can be identified (Woods & Butler, 2020). In the field of sports, tests and measurements are of great importance (Löllgen & Leyk, 2018). It contributes to assessing the development of a player's level both during training and in the context of competitions, as well as diagnosing his needs related to physical, skillful, planning and psychological abilities (Schinke, Stambulova & Moore, 2018). Moreover, these tools contribute to enhancing the athlete's performance and dealing with weak points or mistakes that may appear during his sports career (Hughes et al., 2019; Hussein & Kasim, 2022). Wrestling is a top individual combat sport that depends mostly on how well you can coordinate your muscles and how well you can use basic technical skills (Bazarov, 2022). To play this sport correctly, you need to know the rules and how to officiate (Mazer, 2020). This sport is part of the curriculum at colleges that teach physical education and sports sciences. It includes both practical and theoretical parts (Peng, Wang, & Li, 2021). However, it is observed that certain disciplines, especially theoretical sciences, prioritize cognitive aspects over skill-based

Proximus Journal of Sports Science and Physical Education
Volume 2, Issue 11, November, 2025
https://proximusjournal.com/index.php/PJSSPE
ISSN (E): 2942-9943

aspects (Tilakov & Ospanova, 2022). Wrestling is unique in that participants must concentrate on their personal growth and performance (Mirzaei, 2021). This assessment can be conducted through the regular implementation of simple tests, which enhance their ability to understand their physical and cognitive performance metrics, including the evaluation of endurance and strength gained that fosters athletic effectiveness (Ali & Kasim, 2022; Thomas & Zamanpour, 2018).

Consequently, it is imperative to develop a reliable scientific assessment tool to evaluate the fundamental knowledge and skills acquired by students in this field, based on the principles of measurement and educational evaluation, thereby improving student performance and informing instructional programs in accordance with educational objectives. The goal of this study is to create a simple assessment tool that wrestlers and coaches can use to accurately measure skill and knowledge levels. This will make it easier to track progress in these areas over time, which is an important part of the sport.

Research Problem

Wrestling is a sport that requires a lot of physical effort and time, so the athlete needs to have enough stamina to perform at their best and get the results they want (Mazer, 2020). The researcher, leveraging practical experience in testing, measurement, and wrestling as a specialized coach, noted that numerous traditional assessments for evaluating skill and cognitive performance may not correspond with recent advancements in the sport or may have experienced a decline in accuracy in providing realistic values. The researcher chose to develop a unique assessment characterized by simplicity, speed, and suspense to evaluate skill and cognitive performance in a practical and accessible way. This assessment aims to streamline the performance evaluation process without imposing extra demands on the coach or athlete. The assessment of student performance in the theoretical sciences branch regarding wrestling is deficient in standardised evaluation tools that integrate both skill and cognitive dimensions, particularly given the disparity in physical and theoretical backgrounds of these students compared to their peers in practical disciplines. The issue is as follows: "Absence of a dependable and standardised assessment to evaluate cognitive and skill performance in wrestling among third-stage students in the theoretical sciences branch."

Research Objectives

1. Designing and codifying a test to measure the level of cognitive and skill performance in wrestling among third-stage students at the Faculty of Physical Education and Sport Sciences.
2. Finding levels and standards to evaluate the level of cognitive and skill performance in the subject of wrestling among the students of the third stage in the Faculty of Physical Education and Sport Sciences.

The importance of the research

The importance of the research stems from the following points:

1. Assist in the development of a scientific assessment designed to evaluate the performance of students in the theoretical sciences discipline about wrestling.
2. It aids in identifying pupils' strengths and limitations regarding abilities and knowledge.
3. It aids educators in enhancing curricula and pedagogical approaches.
4. It serves as a reference for other academics aiming to create evaluation systems for comparable sports topics.

Research Hypotheses

1. 1. Statistically significant disparities exist between students' performance before and after the exam (in the context of pre-/post-tests).
2. The developed assessment exhibits a significant level of integrity, reliability, and impartiality.

Research Areas

Proximus Journal of Sports Science and Physical Education
Volume 2, Issue 11, November, 2025
https://proximusjournal.com/index.php/PJSSPE
ISSN (E): 2942-9943

Human Areas: Students of the third stage of the Faculty of Physical Education and Sport Sciences (30) students.
Temporal Areas: First Semester of the Academic Year (2024-2025).
Spatial Areas: The halls of the Faculty of Physical Education and Sport Sciences.

Methodology

Research Methodology

The researcher adopted the descriptive approach in the method of developmental studies to suit the nature of the research, which aims to design an achievement test that combines the cognitive and skill aspects, and to verify its psychometric characteristics.

Research community and sample

Research Population: Students of the third stage at the Faculty of Physical Education and Sport Sciences.
Research Sample: It consisted of (30) students who were selected by the intentional method because they represent the target group for the test.

Research Tools

Cognitive Achievement Test

The assessment is intended to evaluate theoretical proficiency in wrestling and comprises several question formats (multiple choice, true/false, completion, and essay), with a maximum score of 60.

Practical Skill Test

The objective is to assess fundamental wrestling abilities relevant to the theoretical sciences discipline, including three core competencies assessed using a standardised scorecard, with a maximum total score of 40.

Note card

It was designed to evaluate students' proficiency in the three competencies, with sub-indicators allocated across designated grades.

Result Registration Form

To record the final grades of each student and gather data for statistical analysis.

Test Design Procedures

1. Determine the educational objectives of the wrestling subject (knowledge – understanding – application – performance).
2. Analyze the scientific and skill content of the course.
3. Formulate theoretical questions and practical skills appropriate to the sample level.

Building Cognitive Test

It aims to measure the understanding, comprehension and analysis of the laws and foundations of wrestling.

Formulating Questions: Formulating different types of questions:

Multiple choice: to measure recall and comprehension (example: what is the maximum break time between rounds?).

Reasoned Truth and Error: To measure knowledge of laws and analysis (example: Is it allowed to grab the opponent from the shirt?

Short essay questions: To measure comparability and explain strategies (e.g., explain the stages of the "Sweep" process).

Determining the Criteria for Correction: Developing an accurate and specific answer form to correct objective and essay questions.

Building the Skill Test

It aims to measure the quality of technical performance and kinetic application.

Proximus Journal of Sports Science and Physical Education
Volume 2, Issue 11, November, 2025
https://proximusjournal.com/index.php/PJSSPE
ISSN (E): 2942-9943

Selection of core skills: Identify the most important skills that have been trained (e.g., arm dropping, "bridge" defense, entry into the fixture).
Setting performance conditions: Setting precise controls for how each skill is performed (e.g., the performance of the backdrop skill must be done in 5 seconds, without touching the knee to the ground before domination).
Rating Scale Construction: A rating scale (e.g., 1 to 5) is designed for each skill element, with clear criteria for grading.
Finding the scientific foundations of the test.
Scientific Foundations of the Test:
Validity of the test:
In addition to finding the apparent truthfulness of the test by presenting it to experts and specialists, the discriminatory honesty was found by calculating the differences between the results of the junior test (10) and the results of the youth test (10) as shown in Table (2).
Test Stability:
The test was found to be stable by the repetition method, as the first test was conducted for the young sample on 11/2/2024 and was repeated again on 18/2/2024 under the same conditions as the first test was conducted.
Objectivity of the test:
Since the test in E is a key to correction and cannot be manipulated, and the test result is easy to find by the evaluator, the test is considered a subject and the results of E cannot be manipulated. The test is also objective, as it is fixed the higher the coefficient of stability, which leads to a rise in the coefficient of objectivity.
Exploratory Experience:
The researcher executed the exploratory experiment on November 10, 2024, including a sample of eight Faculty of Physical Education and Sport Sciences students. The experiment was replicated one week later, namely on 17/10/2024, with the same sample and conditions, with the objective of doing the following:

1. Assessing the appropriateness of the test for the study sample.
2. Determine the appropriate time to administer the exam.
3. Acknowledging the challenges that the researcher and supporting personnel may encounter Identify the essential instruments required to perform the assessment.
4. Determine the suitable weight for this pre-owned bag.

Application of the test: The test was applied to the construction sample consisting of (30) students of the third stage, after which the criteria and levels were found for selection.
Statistical Methods Used
The following statistical methods were used to analyze the results:

1. Arithmetic mean and standard deviation.
2. Stability coefficient (Cronbach's alpha or retest).
3. Simple correlation coefficient (Pearson) to check the relationship between knowledge and skill scores
4. The difficulty and discrimination factor for the theoretical test paragraphs.

Results
Presentation of the results of the achievement test
The achievement test (cognitive and skill) was applied to a sample of (30) students of the third stage at the Faculty of Physical Education and Sport Sciences, and the correction was conducted according to the answer forms and pre-prepared observation cards. After the researcher reached the results by applying the proposed test and to achieve the research goal of finding the standard scores for the cognitive test on the students of the third stage of wrestling, the raw data was obtained, where (it requires converting the raw scores into standard

Proximus Journal of Sports Science and Physical Education
Volume 2, Issue 11, November, 2025
https://proximusjournal.com/index.php/PJSSPE
ISSN (E): 2942-9943

scores, which is a means of determining the relative state of the raw scores, and therefore these scores can be changed and their results can be evaluated, so the researcher calculated the standard scores according to Table (1).

Table 1: Shows the arithmetic medians, standard deviations, coefficient of difference, and the highest score and lowest score of the cognitive achievement test.

Test	M	SD	Standard Error	Divergence coefficient	Highest grade	Lowest grade
Cognitive Test	35.59	6.3	0.54	6.799	42.6	28.58

Through Table (1), it is clear that the arithmetic average of the freestyle wrestling cognitive test, which was applied to the research sample members, was 15.47, while the standard deviation reached 0.88 and the coefficient of difference was 5.688. The highest score was 17, and the lowest score was 14. Based on these results, the researcher made sure that the sample was distributed normally by extracting the standard error. After analyzing the results derived from the table, the researcher determined the necessary relationship to extract the fixed number, as this number was later used in the preparation of standard tables modified by the sequential method. The arithmetic average (50) in the benchmark score table is a basic criterion, and the standard scores are adjusted based on the fixed number that is added or subtracted from the arithmetic average of the test. The adjusted standard scores were characterized by a fixed arithmetic mean of 50 and a standard deviation with a balanced score. Through these details, the researcher believes that the use of modified standard scores is an effective tool for comparing the raw scores obtained by the laboratory with the corresponding adjusted standard scores. This practice provides a reference from which to evaluate the performance of players in comparison to their peers in the skills measured by the test. Furthermore, these benchmarks help to make comparisons with a benchmark to determine the level of development achieved by the players, which contributes to the improvement of training methods and capacity development in a precise and specific manner.

View and discuss the levels for the skill test.

The extraction of standard grades is a crucial phase in rationing, as the raw bicycles produced by the laboratory are not utilized for comparison with other laboratories until they are transformed into standard bicycles. Benchmarks are predetermined standards that indicate the goals to be achieved, as they include scores that represent the necessary levels. The researcher utilized the normal distribution curve (Kaus), a common distribution in the field of physical education. The researcher chose five levels for the test, and Table 2 shows the results after assigning standard scores to those levels.

Table 2: Shows the arithmetic media, standard deviations, coefficient of difference, and the highest and lowest score of the skill performance test.

Test	M	SD	Standard Error	Divergence coefficient	Highest grade	Lowest grade
Skill Test	21.39	5.7	0.31	4.92	31.4	10.01

Table (2) shows that the students were put into the "acceptable" group. The average level of 80 had the highest percentages, with 50 players making up the total sample. The second percentage showed an average of 21.39, a standard deviation of 5.7, a standard error of 0.31, a coefficient of variation of 4.10, a highest score of 31.4, and a lowest score of 10.01. The researcher asserts that the sample's concentration at an acceptable level, exceeding other levels, results from specific deficiencies in the ability to withstand arm strength. This concentration does not mean that all players are weak in this test, as shown by the different percentages seen at other levels.

Discussion of the results

Proximus Journal of Sports Science and Physical Education
Volume 2, Issue 11, November, 2025
https://proximusjournal.com/index.php/PJSSPE
ISSN (E): 2942-9943

The effectiveness of the assessment examination The findings demonstrated that the cognitive and skill assessment was effectively designed and successfully distinguished between different student levels, indicating strong psychometric properties. The simplified design of the selected abilities and the performance evaluation method employing a standardized note card enabled the test's relevance to a theoretical field that generally does not involve stringent practical performance. The findings substantiated the premise that a cognitively adept student is often more capable of performing the requisite skill, thereby supporting the idea of integration between theoretical and practical education, even in theoretical domains. Based on these findings, the test could be used in the future as an official way to measure students' skills, and it could even be improved to include higher levels of study or expertise. The research sample displayed notable levels of knowledge acquisition, suggesting that the students achieved a measurable degree of success, as evidenced by significant results indicating that the sample members attained average proficiency in wrestling. Ericsson (2020) posits that scientific knowledge affects the learner's acquisition of knowledge and information, augmenting their ability for scientific performance, which bridges the auditory-visual perceptions they have experienced and the motor sense of 'insight.' Li and Shen (2024) assert that cognitive preparation enhances the development of players' or students' cognitive processes and nurtures skills such as analysis, synthesis, and evaluation. These cognitive processes require continuous mental engagement to meet competitive demands within the context, as practical performance signifies the application of acquired knowledge and information (Tomporowski & Pesce, 2019; Jabbar & Kasim, 2023). There is a correlation between the examination of theoretical subjects centered on mental training and the improvement of students' performance in practical lessons. Schmidt and Lee (2025) and Kasim (2022) contend that it is challenging to distinguish mental or intellectual training from motor training, both of which are integral to mastering the art of performance. Scharfen and Memmert (2019) affirm the relationship between achievement and motor performance, suggesting that elevated achievement enhances cognitive and creative development, thereby providing individuals with essential experiences in measurement and evaluation. The relationship between achievement and practical preparation greatly assists students in gaining skills and knowledge relevant to practical tasks in various subjects, consequently enhancing their academic proficiency and performance. This, in turn, makes them feel better mentally, boosts their self-esteem, and encourages them to be competitive so they can find good ways to do things.

Conclusions

Based on the outcomes of statistical analysis and data interpretation, the researcher arrived at the following conclusions:

1. The developed assessment has strong psychometric properties (integrity, reliability, objectivity), rendering it an appropriate instrument for evaluating the competencies and knowledge attainment of students in the Faculty of Physical Education and Sport Sciences.
2. The third-stage students possess a commendable level of understanding in wrestling, aligning with the objectives of the required curriculum.
3. The pupils' skill performance level was satisfactory, despite their theoretical background, indicating the effectiveness of selecting fundamental skills suitable for this level.
4. A moderate positive association exists between knowledge level and skill achievement, signifying the interrelation of these elements in developing student competence.
5. The design of this test facilitates a more accurate and objective detection of individual differences among students.

Recommendations

Based on the researcher's findings and conclusions, he recommends the following:

Proximus Journal of Sports Science and Physical Education
Volume 2, Issue 11, November, 2025
https://proximusjournal.com/index.php/PJSSPE
ISSN (E): 2942-9943

1. Approval of the designed test as an official evaluation tool for the students of the College of Physical Education and Sport Sciences in the subject of wrestling.
2. Popularizing the idea of designing dual achievement tests (cognitive + skill) to other mathematical subjects in the theoretical and practical branches.
3. The necessity of training faculty members to construct balanced achievement tests, apply them, and analyze their results.
4. Include simplified practical vocabulary in the teaching programs of the students of the Faculty of Physical Education and Sport Sciences that qualifies them for basic applied performance.
5. Providing short training workshops or additional practical lessons to support the skill aspects of the students of the College of Physical Education and Sport Sciences.

Propositions

In order to complete this research, the researcher recommends conducting the following studies:

1. Designing similar achievement tests for students of other stages or teaching materials for comparison.
2. Conducting a comparative study between the performance of male and female students in wrestling using the same assessment tools.
3. Designing interactive electronic tests that measure theoretical and practical skills through virtual reality simulation.
4. Preparing a training manual for faculty members on how to construct and codify sports achievement tests.

References

1. Al Behadili, H. J. H., & Kasim, M. A. (2022). Developing Ball Dribbling And Passing Skills Using The Integrative And Reciprocal Methods Of Emerging Footballers. *International Journal of Revolution in Science and Humanity*, *10*(2), 13-20.
2. Ali, H. F. S., & Kasim, M. A. (2022). The Effect Of An Educational Curriculum Using The Jigsaw Strategy To Learning Skills Of Volleyball For Secondary School Students. *European Journal of Interdisciplinary Research and Development*, *9*, 160-168.
3. Andrew, D. P., Pedersen, P. M., & McEvoy, C. D. (2019). *Research methods and design in sport management*. Human Kinetics.
4. Bazarov, K. I. (2022). Agility And Coordination In The System Of Physical Training Of Those Involved, Specializing In Wrestling And Martial Arts. *European International Journal of Multidisciplinary Research and Management Studies*, *2*(08), 73-78.
5. Ericsson, K. A. (2020). Towards a science of the acquisition of expert performance in sports: Clarifying the differences between deliberate practice and other types of practice. *Journal of sports sciences*, *38*(2), 159-176.
6. Hughes, M., Franks, I., Franks, I. M., & Dancs, H. (Eds.). (2019). *Essentials of performance analysis in sport*. Taylor & Francis.

Proximus Journal of Sports Science and Physical Education
Volume 2, Issue 11, November, 2025
https://proximusjournal.com/index.php/PJSSPE
ISSN (E): 2942-9943

7. Hughes, M., Franks, I., Franks, I. M., & Dancs, H. (Eds.). (2019). *Essentials of performance analysis in sport*. Taylor & Francis.
8. Hussein, A. T., & Kasim, M. A. (2022). The Effect Of Applying The Strategy Of Educational Scientific Pillars On The Level Of Performance Of Some Handball Skills Among Players Misan University. *American Journal of Research in Humanities and Social Sciences*, *15*, 51-63.
9. Jabbar, Q. M., & Kasim, M. A. (2023). Social adaptation and psychological adjustment and their relationship to defensive skills in volleyball for the Premier League. *European Journal of Interdisciplinary Research and Development*, *12*, 134-143.
10. Kasim, M. A. (2022). Evaluation Implementing Cooperative Learning In Physical Education College Programs To Basic Handball Skills Learning In Universities Iraqi. *ResearchJet Journal of Analysis and Inventions*, *3*(04), 289-297.
11. Li, Y., & Shen, T. (2024). Research on the Path of Promoting the Intellectual Development of College Students Through Physical Education and Sports Based on the Five Educational Philosophies. *The Educational Review, USA*, *8*(4).
12. Löllgen, H., & Leyk, D. (2018). Exercise testing in sports medicine. *Deutsches Ärzteblatt International*, *115*(24), 409.
13. Mazer, S. (2020). *Professional wrestling: Sport and spectacle*. Univ. Press of Mississippi.
14. Mazer, S. (2020). *Professional wrestling: Sport and spectacle*. Univ. Press of Mississippi.
15. Mirzaei, B. (2021). Development of the elite wrestling athlete. *International Journal of Wrestling Science*, *11*(1), 11.
16. Peng, W., Wang, L., & Li, Q. (2025). Incorporating Wrestling into Physical Education Curriculum for the Development of. *Frontiers in Psychology*, *16*, 1643481.
17. Scharfen, H. E., & Memmert, D. (2019). The relationship between cognitive functions and sport-specific motor skills in elite youth soccer players. *Frontiers in psychology*, *10*, 817.
18. Schinke, R. J., Stambulova, N. B., Si, G., & Moore, Z. (2018). International society of sport psychology position stand: Athletes' mental health, performance, and development. *International journal of sport and exercise psychology*, *16*(6), 622-639.
19. Schmidt, R. A., & Lee, T. D. (2025). *Motor learning and performance: From principles to application*. Human Kinetics.
20. Thomas, R. E., & Zamanpour, K. (2018). lnjuries in wrestling: systematic review. *The Physician and sportsmedicine*, *46*(2), 168-196.

Proximus Journal of Sports Science and Physical Education
Volume 2, Issue 11, November, 2025
https://proximusjournal.com/index.php/PJSSPE
ISSN (E): 2942-9943

21. Tilakov, A., & Ospanova, A. (2022). Wrestling is a spiritual and valuable sport. *International Journal of Innovative Research in Science Engineering and Technology*, *11*, 3377-3380.
22. Tomporowski, P. D., & Pesce, C. (2019). Exercise, sports, and performance arts benefit cognition via a common process. *Psychological bulletin*, *145*(9), 929.
23. Williams, S. M., & Lacy, A. (2018). *Measurement and evaluation in physical education and exercise science*. Routledge.
24. Woods, R., & Butler, B. N. (2020). *Social issues in sport*. Human Kinetics Publishers.