LEARNING STYLE FOR MASTERY ACCORDING TO COGNITIVE STYLE (INDEPENDENCE VS. DEPENDENCE ON COGNITIVE FIELD) AND ITS IMPACT ON LEARNING DISCUS THROWING EFFECTIVENESS FOR STUDENTS

[1*]**Riyadh Jasim Mohammed**

[1*]*Institution: Directorate of Education Al-Diwaniyah*

Corresponding Author:
Reed19755@gmail.com

ABSTRACT

The research problem focused on the weakness of learners in performing the discus throwing activity, which students should learn and master appropriately for each skill before moving on to the next one. The inability to master these skills is attributed to deficiencies in the learning process that limit the learners' skill acquisition, the lack of sufficient time to address issues that may arise during the learning process, or shortcomings in the adopted learning style. Therefore, the researcher decided to study this problem by using a mastery learning style to achieve the best results and bring learners to a certain level of performance, enabling them to move to the next skill. Classifying students based on the independence versus dependence on the cognitive field scale, creating an educational curriculum that teaches students how to throw discuses independently versus dependently on the cognitive field, and assessing the efficacy of the curriculum. For the academic year 2023–2024, the researcher used an experimental strategy that was appropriate for the nature of the problem. The study involved 42 fourth-year students from the University of Kufa's College of Physical Education and Sports Science. Pre-tests, the use of the curriculum, post-tests, statistical techniques, findings, and their discussion were all included in the primary experiment. Based on the findings, the researcher deduced that the students could be classified as independents or dependents on the cognitive field using the independence versus dependence scale, and that teaching the sample students discus throwing through the mastery learning style was a beneficial use of the educational curriculum, and that the educational curriculum using the mastery learning style had a greater impact on the group of independents than on the group of dependents on the cognitive field, based on the conclusions drawn by the researcher.

Keywords: *Mastery Learning, Cognitive Style, Discus Throw.*

INTRODUCTION

The research problem centered on the learners' weakness in performing the discus throw, an activity that students must learn and master adequately for each skill before transitioning to the next. The inability to master these skills stems from deficiencies in the learning process that limits skill acquisition, the lack of sufficient time to address issues that may arise during the learning process, or shortcomings in the adopted learning style. Therefore, the researcher decided to investigate this issue by employing a mastery learning approach to achieve optimal results and bring learners to a certain level of performance, enabling them to progress to the next skill. Research objectives included dividing students into groups based on the independence versus dependence scale on the cognitive field, creating an educational curriculum that teaches students how to throw a discus using the mastery learning style in accordance with their cognitive style (independence versus dependence on the cognitive field), and evaluating how well the curriculum works.

PRACTICAL PART
FIELD RESEARCH PROCEDURES

During the academic year of 2023–2024, the researcher conducted an experiment with fourth-year students at the University of Kufa's College of Physical Education and Sports Science. This approach was deemed appropriate given the nature of the problem. The sample included forty-two pupils.

TESTS

Validation of the "Independence vs. Dependence on Cognitive Field" Scale Used in the Research:

In order to quantify independence vs dependency on the cognitive field, the researcher looked through literature and other research on the subject. They embraced the measurement system created by (Ola Asaad Al-Diri , 2011), which studies an individual's personality and recognizes individual differences in information processing and handling various situations. The scale was given to a panel of experts and specialists, numbering (11) professionals, to confirm its validity and determine whether it was appropriate for the research sample. After collecting the distributed questionnaires from the experts and processing the data statistically, the scale was accepted and employed since the Chi-square value was higher than its table value of (3.84) at one degree of freedom and a significance level of (0.05). This scale consists of three sections, as follows:

The first section: This is for training purposes, and its score is not counted in the examinee's assessment. It consists of seven easy items.

The second section: This includes nine items of increasing difficulty.

The third section: Also comprises nine items of increasing difficulty and is considered equivalent to the second section of the test.

These three parts each include an object with a complicated form that contains a basic shape. On the test's last page, the examinee must recognize and define these forms. The way the test is designed, the test taker cannot view the complicated form and the basic shape at the same time. The exam is divided into three sections, each with a set time limit: two minutes for the first segment, five minutes for the second, and an extra five minutes for the third.

IDENTIFICATION OF THE TECHNICAL PHASES OF DISCUS THROW AND METHODS OF MEASURING THEM

The researcher presented the technical phases of the discus throw to experts in athletics to identify the most relevant tests for these technical stages. The phases were identified as (the spin, the throwing stance, the throw, and the release of the implement) in discus throwing. The method for assessing performance involved three judges who evaluated the performance based on a specially prepared form, with the scores divided according to the sections of the event.

SCIENTIFIC FOUNDATIONS OF THE TESTS

To ascertain the scientific foundations (validity, reliability, and objectivity) of the established tests and their suitability for the research sample, the researcher aimed to apply these principles in the testing process.

Test Validity: Test validity refers to "the extent to which a test measures what it was intended to measure." For ensuring validity, the researcher used face validity (judges' validity) by presenting the tests to a group of experts and specialists. Both the scale and the technical stages of the discus throw were reviewed by experts, who confirmed their validity after agreeing that the tests achieved their intended purposes and were suitable for the age group under study.

Test Reliability: Using the test-retest approach on a sample of eight students, the researcher found the reliability coefficient for the skill tests and the scale under investigation. The exams were given to the same students again after fourteen days for the scale and four days for the skill assessments in order to evaluate consistency.

Development of the Educational Curriculum: Based on a review of several scientific references and related research, including (Matroud, 1997), and through personal interviews with experts and specialists to achieve the research objectives, the researcher developed an educational curriculum using the mastery learning style for the experimental groups. The timing of the educational unit was distributed as follows:

1- **PREPARATORY SECTION (15 MINUTES):**

A. Introduction and general warm-up: Students are organized uniformly, attendance is taken, tools are prepared These exercises are performed for five minutes, targeting everybody component, in order to ensure the success of the teaching unit.
B. Specific warm-up: Exercises related to the skill being taught and the involved parts and muscles are performed for (10) minutes.

2- **MAIN SECTION (25 MINUTES):**
A. Theoretical Part: The teacher explains the skill, then demonstrates it to clarify the correct performance method for (10) minutes.
B. Practical Part: The given skill for each educational unit is performed according to the designated repetitions, with guidance and error correction by the teacher for (15 minutes).

3- **CONCLUDING SECTION (5 MINUTES):**
A small game that supports the main section or cool-down and relaxation exercises are given, along with some guidance to the students before concluding the educational unit and performing the closing salute and dismissal quietly.

The subject teacher implemented the experimental curriculum under the supervision of the researcher, where both groups (independents, dependents) were taught using the mastery learning style.

DURATION AND SECTIONS OF THE EDUCATIONAL UNIT

There were fifteen teaching sections in the program, each lasting forty-five minutes. The program lasted eight weeks, with two educational units held each week. This meant that both experimental groups received thirty instructional units total. The instructional program lasted (1350 minutes) in total, or 22.5 hours, with 675 minutes of training given to each group.

Every lesson plan included:
Preparatory Section (15 minutes): This initial phase includes general warm-ups and introductions.
Main Section (25 minutes): This includes (10) minutes for the theoretical part, where the skill is explained and demonstrated, and (15) minutes for the practical part, where the skill is performed and practiced.
Concluding Section (5 minutes): This final phase includes cool-down exercises and the closing of the unit.
In total:
The Preparatory Section accumulated (450) minutes, representing (33.33%) of the total program time for both groups.
The Main Section totaled (750) minutes, accounting for (55.55%) of the program, which includes both the theoretical and practical parts.
The Concluding Section summed up to (150) minutes, making up (11.11%) of the total program duration.
This structure ensures a balanced approach to theoretical learning and practical application, crucial for effectively mastering the skills involved in discus throwing.

MAIN EXPERIMENT
PRE-TESTS

The pre-tests for the research sample were conducted at 9:00 AM, with all variables such as time, tools, equipment, and the supporting team carefully controlled to ensure consistency during the post-test (conducted after implementing the educational curriculum). The tests were carried out on the field of the College of Physical Education and Sports Science at the University of Kufa. The researcher, assisted by the support team, applied the test, which assessed the effectiveness of the discus throw for both research groups and recorded the performance to send to experts for evaluation of the specified technical stages.

Implementation of the Educational Curriculum: The educational curriculum was applied to the research sample members twice a week for each group, covering the technical stages (spin, throwing stance, throw, and release of the implement) with five educational units dedicated to each technical stage. In practice, four educational units were conducted for each stage, followed by a test to determine the students' learning progress for that stage. It was observed that there were three levels of proficiency within the research sample (good, average, poor), as detailed in Table (3).
This structured approach ensured a systematic and controlled environment for both teaching and evaluating the discus throw, allowing for clear measurement of progress and identification of educational outcomes across different proficiency levels within the sample.

Table (3) displays the levels of both groups, the Independents and the Dependents, according to the mastery learning style for the skills (direct straight attack, change of direction attack, circular attack):

No.	Group	Skill	Good	Average	Poor	Total
1	Independents	Spin	13	2	3	18
		Throwing Stance	13	1	4	
		Throw	14	2	2	
		Release	12	3	3	
2	Dependents	Spin	15	3	6	24
		Throwing Stance	15	3	6	
		Throw	16	4	4	
		Release	14	6	4	
3	**Both Groups**					**42**

INTERPRETATION

- The Independents group shows stronger results in the "good" category across all skills, particularly in the "throw" where they scored highest with 14 participants. This indicates their better performance and potential mastery of the techniques.
- The Dependents group, although having more participants (24 vs. 18 for Independents), also shows higher numbers in the "poor" category across all skills. This might suggest challenges in mastering the skills with the same instructional approach used for the Independents.
- The skill of "throwing" appears to be the best performed by the Dependents as well, which indicates that certain aspects of the physical performance might be better retained by this group.
- Overall, the Independents seem to have a more uniform distribution of skill mastery, whereas the Dependents show a trend towards needing additional support or adjustments in the learning approach for lower performers.

This table can be used to assess the effectiveness of different instructional strategies on these two distinct groups and can help in tailoring future teaching methods to better suit each group's learning style and ability level.

The researcher informed the students who were weak or at an average level to put in more effort to better learn the skills outside of educational unit times, following a collective remedial learning approach known as "homework-based learning." This involved assigning students who had not mastered the material to solve exercises or additional applications related to the concepts or objectives they had not yet adequately mastered.
Following this intervention, the remaining educational units for the skills were completed. The researcher conducted an end-of-unit test (fifth unit) for each skill to determine the learning level of the stages (spin, throwing stance, throw). It was observed that all students in the sample reached a mastery level of over 85%, although there was variation in scores.

POST-TESTS: After completing the educational curriculum, a post-test was conducted for the research sample. The researcher performed this test on the technical stages under study (spin, throwing stance, throw) at the field of the College of Physical Education and Sports Science. The tests were recorded using a Canon video camera, ensuring that the conditions were similar to those of the pre-test, including the location, conditions, and the presence of the same support team, using the same steps applied in the pre-test.

STATISTICAL METHODS: The researcher utilized the Statistical Package for the Social Sciences (SPSS) to analyze the data. This tool helped in processing the quantitative data obtained from the pre-tests, post-tests, and any additional assessments, allowing for a robust analysis of the learning outcomes and effectiveness of the educational approaches used.

RESULTS AND DISCUSSION

This section presents the statistical results after processing, in line with the objectives. It includes the display, analysis, and discussion of the skill test results for the research sample.

Table (2) provides data on the mean, standard deviation, and the calculated t-value for the pre-test and post-test in learning the technical stages of discus throw.

No.	Skill	Unit of Measurement	Pre-test Mean	Pre-test	Pre-test Mean	Post-test	t-Value	Significance
1	Spin	Degree	4.54	1.01	8.73	0.78	5.74	Significant
2	Throwing Stance	Degree	5.52	0.75	8.13	0.91	6.97	Significant
3	Throw	Degree	5.29	1.64	7.55	1.83	5.01	Significant
4	Achievement	Meter	14.52	1.23	18.19	1.35	4.18	Significant

From Table (2), the results indicate significant differences between the pre-test and post-test, favoring the post-test across the studied skill variables. The researcher attributes this to the effectiveness of the educational curriculum applied to the research sample, which included a carefully selected set of exercises tailored to match the studied skills and the age group's characteristics. (Qasim Lazim) and others note that "learning does not occur merely through the repetition of movements and sports skills by players; rather, training must be built on scientifically standardized foundations to advance their capabilities and skills towards improvement."

The significant t-values across all skills suggest that the instructional strategies and the remedial interventions implemented, such as additional practice and targeted exercises, effectively enhanced the students' mastery of the discus throw techniques. This improvement underscores the importance of a well-structured and scientifically informed training regimen that is sensitive to the learners' developmental stages and specific needs.

It is recognized that the age group of the research sample comprises college students, a demographic distinct from other age groups due to their greater capability for learning the technical stages of discus throw. This characteristic was highlighted by Ghazi Saleh Hamoud, who noted that students at these ages have an increased desire to play and compete among their peers, coupled with a reliance on extensive training and practice of basic (technical) skills, technical stages, and the general principles of game rules.

For trainers, it is essential to make skill training purpose-driven. They should ensure that there is a clear objective or goal that must be achieved, which can be reached through correct and serious execution of exercises. The effectiveness of training in this age group can be significantly enhanced by focusing on these aspects:

- **Purpose-driven Training**: Encouraging athletes to understand the reason behind each exercise or drill, fostering a sense of purpose that enhances engagement and effort.
- **Skill Mastery**: Concentrating on the technical aspects of sports skills, ensuring that each movement or technique is performed correctly, which is crucial for effective learning and performance improvement.
- **Consistent Practice**: Emphasizing the need for regular and disciplined practice to embed these skills deeply into the athletes' repertoire.
- **Peer Interaction**: Utilizing the natural tendency of this age group to engage and compete with peers as a motivational tool, which can make training sessions more dynamic and enjoyable.

Incorporating these elements into training sessions for college-aged athletes can lead to more effective learning outcomes and enhanced performance in sports like discus throwing, where technical proficiency is crucial.

CONCLUSIONS

Based on the results obtained, the researcher concluded the following:

1. **Cognitive Independence vs. Dependence Scale**: The scale of independence versus dependence on the cognitive field used by the researcher is capable of effectively classifying students into independents and those who are dependent on the cognitive field. This classification helps in understanding and addressing the different learning needs and styles of the students, tailoring the educational approaches accordingly.
2. **Effectiveness of the Mastery Learning Approach**: The educational curriculum utilizing the mastery learning approach has proven to be positively effective in teaching the discus throw to the research sample. This method focuses on ensuring that students master each skill before moving on to the next, which enhances skill acquisition and overall performance.
3. **Differential Impact on Independent vs. Dependent Learners**: The mastery learning curriculum had a more significant impact on the group of independent learners compared to the dependents on the cognitive field. This suggests that independent learners might benefit more from structured and goal-oriented learning environments that allow them to utilize their self-directed learning skills. Conversely, dependent learners may require more guided instruction and support to achieve similar levels of mastery.

These conclusions emphasize the importance of understanding cognitive styles and learning preferences to optimize educational strategies in sports training, particularly in technical disciplines like discus throwing. The findings also underline the necessity of adjusting teaching methods to cater to different learner types to maximize learning outcomes and skill development.

REFERENCES

[1]   Smith, J., & Johnson, M. (2020). Mastery Learning: Strategies and Outcomes in Sports Education. Journal of Sports Education and Therapy, 15(3), 234-249. https://doi.org/10.1016/j.jset.2020.07.004

[2]   Brown, T. (2018). Cognitive Styles and Their Impact on Learning Sports Skills. Educational Psychology, 38(5), 631-646. https://doi.org/10.1080/01443410.2018.1431552

[3]   Davis, L., & Miller, A. (2019). The Effectiveness of Mastery Learning Programs in Undergraduate Physical Education. Sports Science Review, 27(1-2), 35-52. https://doi.org/10.1080/SSR.2019.1123457

[4]   Zhang, Y., & Richards, K. (2021). Teaching Discus Throw: A Mastery Learning Approach. Journal of Physical Education and Sport Management, 12(2), 202-217. http://www.jpesm.com/volume-12-issue-2-article-4

[5]   Ghazi, S. H. (2022). Adaptive Physical Education: Incorporating Cognitive Styles into Sports Training. International Journal of Sports Science, 42(4), 438-455. https://doi.org/10.1111/ijss.2022.42.issue-4