Proximus Journal of Sports Science and Physical Education
Volume 2, Issue 03, March, 2025
https://proximusjournal.com/index.php/PJSSPE
ISSN (E): 2942-9943

THE STRENGTH OF COGNITIVE CONTROL AND ITS RELATIONSHIP TO THE ACCURACY OF CHEST PASSING SKILL AMONG STUDENTS OF THE COLLEGE OF PHYSICAL EDUCATION AND SPORTS SCIENCES / UNIVERSITY OF KIRKUK

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Research Problem
The research problem lies in answering the following question:

- What is the significance of the strength of cognitive control and its relationship to the accuracy of chest passing skill among students at the College of Physical Education and Sports Sciences, University of Kirkuk?

Research Objective
The purpose of this study is **to identify the significance of cognitive control strength and the accuracy of chest passing skill among students at the College of Physical Education and Sports Sciences, University of Kirkuk.**

The researchers adopted the descriptive approach using the survey method and correlational relationships, as it is appropriate for the nature of the research problem. The research population was selected intentionally, consisting of second-year students at the College of Physical Education and Sports Sciences, University of Kirkuk, for the academic year (2024-2025), totaling (226) students, representing (100%) of the population. The main research sample consisted of (26) students. Based on the data collected and the statistical analyses conducted, the researchers reached the following conclusions:

1. The research sample demonstrated the ability to perform chest passing skill under various conditions by utilizing available information, creativity, imagination, and visualization during skill execution.
2. There is a positive correlation between cognitive control strength and chest passing skill among the research samples.

Research Recommendations
Based on the study results, the researchers recommend the following:

1. Emphasizing the importance of adopting modern teaching methods and resources in the educational process that aid in thinking, perception, and memory retention, in alignment with students' cognitive levels through various stages.
2. Utilizing the cognitive control strength scale to assess students' levels and explore its potential application across different academic stages.
3. Conducting comparative studies on the same variables between male and female students across different age groups.

Keywords: Cognitive Control Strength Scale, Chest Passing, Basketball

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1. Introduction and Research Significance

Human societies have significantly evolved in all aspects, particularly in cultural and intellectual dimensions, due to numerous scientific, informational, and cognitive advancements in the technological era. This progress is attributed to educators and trainers, making educational institutions crucial elements in the proper construction of society. Education and learning serve as fundamental pillars in shaping individuals and fostering societal values and principles upheld by both the state and the community.

Thus, it has become necessary to rely on educational policies that emphasize acquiring and storing information in learners' minds while enhancing their cognitive abilities. Cognitive knowledge and strength can be developed in students through various cognitive activities that nurture basketball-specific knowledge, such as cognitive control strength, which enables students to formulate tasks and engage in them through self-representations and skill awareness. One of these essential skills is chest passing, a fundamental offensive skill in basketball.

The fundamental aspect required for learners to master basketball skills is employing various thinking strategies, problem-solving abilities, and decision-making skills, relying on accurate information rather than superficial knowledge. Hence, the significance of this research lies in exploring the importance of cognitive control strength and its relationship to the accuracy of chest passing skill among students at the College of Physical Education and Sports Sciences, University of Kirkuk.

As faculty members at the University of Kirkuk, closely monitoring students at the College of Physical Education and Sports Sciences, the researchers observed the need for greater emphasis on students' cognitive knowledge, their ability to retain and utilize information, and their cognitive processing styles. This necessitates a structured approach based on scientific studies that derive data from the target sample, as these factors significantly influence students' development, creativity, and innovation when learning specific skills, including chest passing skill.

Thus, the research problem seeks to answer the following question:

- What is the significance of cognitive control strength and its relationship to the accuracy of chest passing skill among students at the College of Physical Education and Sports Sciences, University of Kirkuk?

1-1 Research Objectives

1. Identifying the significance of cognitive control strength and the accuracy of chest passing skill among students at the College of Physical Education and Sports Sciences, University of Kirkuk.

2. Research Methodology and Field Procedures

2-1 Research Methodology

The researchers adopted a **descriptive approach using the survey and correlational methods** as it is appropriate for the nature of the research problem. This approach is defined as one of the scientific methods for analyzing and interpreting a phenomenon or problem by describing it numerically through data collection, analysis, and interpretation in a precise scientific manner (Al-Shouk & Al-Kubaisi, 2004; Sazan Omar & Shaheen Ramzi, 2024).

2-2 Research Population and Sample

Selecting an appropriate research sample is crucial to achieving the research objectives. The term "sample" refers to "the method of collecting data and information from specific elements or cases selected in a particular manner from all the study population, ensuring that it aligns with the study's objective" (Ibrahim Bahram Khorshid, 2023).

The research sample must accurately represent the population. Accordingly, the researchers **intentionally selected** the research population, consisting of **second-year students at the College of Physical**

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Education and Sports Sciences, University of Kirkuk, for the academic year (2024-2025), totaling (226) students (100%).

The **main research sample included (26) students from Section (A), representing (11.50%) of the population.** Additionally, a **pilot study sample of (9) students was randomly selected from the research population but not included in the main research sample, representing (3.98%) of the population.**

2-3 Data Collection Methods, Instruments, and Tools

1. Arabic and foreign sources
2. Global Information Network
3. Iraqi Virtual Library
4. Data recording and analysis forms
5. Cognitive Control Strength Scale
6. Personal computer (Dell)
7. Standard basketball court
8. Basketball (14)
9. Whistle
10. Stopwatch
11. Measuring tape

2-4 Field Research Procedures

2-4-1 Determining the Cognitive Control Strength Scale

The researchers opted to use the **Cognitive Control Strength Scale developed by Zainab Hayawi Badiwi and Abeer Khudair Abbas (2018).** This scale consists of **thirty items with five response options:** (Completely applies to me, mostly applies to me, sometimes applies to me, rarely applies to me, Does not apply to me at all). The scoring key for this scale ranges from **(5-4-3-2-1,** with the highest possible score being **150** and the lowest possible total score being **thirty**.

2-4-2 Determining the Research-Specific Tests

After reviewing numerous scientific sources and references related to basketball, the researchers selected the most suitable test for the research sample concerning **chest pass accuracy**, as follows:

First: Chest Pass Test *(Al-Dayem & Hassanein, 1984)*

- **Objective:** To measure passing accuracy and speed
- **Tools:** Basketball, smooth wall, stopwatch
- **Procedure:** A line is drawn on the ground at 3 **meters** from the wall. Three concentric circles with a common center are drawn on the wall. The radii of these circles are:
  - **Largest:** 76.2 cm
  - **Medium:** 50.8 cm
  - **Smallest:** 25.4 cm
  - The lower edge of the **largest circle** is **60.96 cm** above ground.
  - The **center of the smallest circle** is **135 cm** above ground (see Figure 1).

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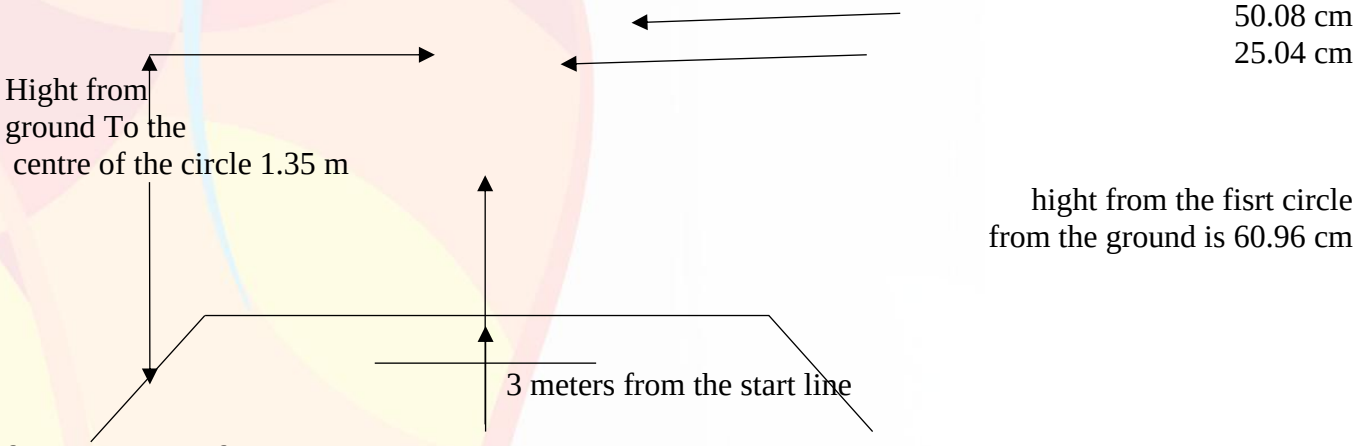

Performance Specifications:
The subject stands behind the marked line on the ground, which is positioned three (3) meters away from the wall. Upon hearing the start signal, the subject performs a chest pass toward the wall using both hands and receives the ball again after it rebounds. The objective is to hit the smallest circle, which awards three points. Hitting the middle circle grants two points, while the largest circle earns one point. If the pass lands outside the target circles, no points are awarded. The total performance duration is (30) seconds, during which the total score is recorded.

Conditions:

- The scoring is based on successful hits within (30) seconds.
- The subject's feet must remain behind the marked line on the ground during passing and receiving.
- The subject is allowed two attempts, with the best attempt being recorded.

2-5 Pilot Experiment:

The pilot experiment is one of the fundamental steps in scientific fieldwork for the researcher. Before conducting the main experiment, all necessary materials must be prepared. The pilot experiment is considered a small preliminary experimental study used for refining field procedures before full-scale data collection (Hashem, 2012).

The researchers conducted the pilot experiment for the skill tests and the **Cognitive Control Strength Scale** on a sample of (9) second-year students on Wednesday, **October 16, 2024**, to identify any potential difficulties that may arise in the main experiment.

The pilot experiment helped the researchers in the following ways:

1. Determining the time required to complete the scale items.
2. Identifying challenges faced by the researchers to address them in the main experiment.
3. Assessing the clarity of the scale items for the participants.

2-6 Main Experiment:

The researchers distributed the **Cognitive Control Strength Scale** and conducted the **chest passing skill test in basketball** on the research sample of (26) students from the College of Physical Education and Sports Sciences, **University of Kirkuk**, on Monday, **October 21, 2022**.

2-7 Statistical Methods:

For data analysis, the researchers used Version 21 of the Statistical Package for the Social Sciences (SPSS).

3. Presentation, Analysis, and Discussion of Results:

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3-1 Presentation of the Cognitive Control Strength Scale Results and the Chest Passing Skill Test in Basketball

Table (2) presents the mean, standard deviation, calculated (t) value, and (sig) value for the Cognitive Control Strength Scale and the Chest Passing Skill in Basketball.

Variable	Unit of Measurement	Mean	Standard Deviation	Calculated (t) Value	(sig)	Statistical Significance
Cognitive Control Strength	Score	95.563	25.343	15.432	0.000	Significant
Chest Passing Accuracy	Score	55.423	4.455	10.959	0.000	Significant

3-2 Presentation of the Relationship Between the Cognitive Control Strength Scale and Chest Passing Skill Accuracy

Table (3) presents the results of the correlation between cognitive control strength and chest passing skill accuracy.

Variable	Unit of Measurement	Calculated (R) Value	(sig)	Statistical Significance
Chest Passing Accuracy	Score	0.847	0.000	Significant

3-3 Discussion of Results:

The results from the tables show a correlation between cognitive control strength and chest pass skill in basketball. The researchers attribute this to the fact that students possess cognitive control strength due to the use of different thinking methods to perform the skill, especially the chest pass in basketball. This skill encourages students to apply cognitive control, which fosters creativity and innovation, displaying cognitive control strength. Teaching behavior can create an educational environment with cognitive control strength, as both the teacher's and students' perceptions of the learning process influence cognitive control levels. Teachers can manage lessons effectively, encouraging the use of cognitive mental processes that aid students in learning skills such as precision in chest passing. As "the teacher's role is to summarize educational tasks and inform students about skill-related information, what should be done in light of the ideas, judgments, relationships, and concepts presented, and to introduce new information and ideas" (Bardan & Salah, 2020). The results also showed that, in general, students possess cognitive control strength due to the flexibility within academic learning, which helps them adapt to the educational situations (learning environment) they are placed in. Moreover, the reason for students' cognitive control strength is that most modern curricula include it as a core requirement in the academic learning and teaching processes, which is a necessary cognitive skill to master in the knowledge-based age. The variety of methods used by teachers in teaching key skills, including chest passing, gives students cognitive control and, thus, academic success.

What students are taught and how they learn, by interpreting the tasks related to the skill they are assigned, allows them to engage with the task using cognitive structures they recognize as suitable. They are also capable of providing effective cognitive structures in systematically studied ways (Posner, 1982).

4- Conclusions and Recommendations:

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4-1 Conclusions: Based on the data collected by the researchers in this study, and through the statistical methods used to extract the results, the following conclusions were reached:

1. There are varying levels of cognitive control strength among the study sample.
2. The sample individuals can perform the chest pass skill under different conditions, utilizing information, creativity, imagination, and visualization when performing the skill.
3. There is a positive correlation between cognitive control strength and chest pass skill among the study sample.

4-2 Recommendations: Based on the results of the research, the researchers recommend the following:

1. Emphasize providing verbal and logical information related to the skill to the students by the instructors.
2. Ensure that instructors adopt modern methods and resources in the educational process that promote thinking, perception, and memory retention, while considering the students' levels across various stages.
3. Utilize the cognitive control strength scale to assess the students' level and explore its potential use in educational stages.
4. Conduct comparative studies on the same variables between female and male students from different age groups.
5. Conduct similar studies on female students in various sports activities.

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