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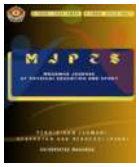

Impact of Klossmeier Cognitive Instructional Model on Teaching Certain Skills on Horizontal Bar in Gymnastics for Students of College of Physical Education and Sports Sciences

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Abstract

The importance of this research lies in fact that the Klossmeier cognitive instructional model is considered one of educational models that relies on classifying levels of cognitive learning from simple to complex. This classification assists students in making an organized transition from an initial understanding of skill to application and mastery. Moreover, this model enables learners to link theoretical knowledge with practical performance and enhances their ability to self-correct errors, which is positively reflected in learning speed and performance accuracy.

research problem is represented by clear deficiency in employing modern cognitive instructional models within gymnastics lessons, which limits effectiveness of teaching horizontal bar skills to students of College of Physical Education and Sports Sciences. absence of gradual cognitive organization in presenting skills and lack of consideration for students' varying levels of understanding contribute to low levels of skill mastery and unstable performance.

aim of research is to identify effect of Klossmeier cognitive instructional model on teaching certain horizontal bar skills in gymnastics to students of College of Physical Education and Sports Sciences. experimental method was adopted, and research sample consisted of third-year students in College of Physical Education and Sports Sciences.

After applying instructional model, most important conclusion reached was that Klossmeier cognitive instructional model plays an important and fundamental role in teaching certain skills on horizontal bar in gymnastics to students of College of Physical

Education and Sports Sciences. Accordingly, study recommends adopting Klossmeier cognitive instructional model due to its importance and essential role in teaching horizontal bar skills in gymnastics.

Keywords: Klossmeier model, cognitive learning, skills, horizontal bar

1.1 Introduction

Education is considered foundation upon which process of developing individuals cognitively and skill-wise is built, as it aims to prepare learners comprehensively, enabling them to think soundly and employ knowledge in various life situations. role of education is particularly evident in sports field through adoption of modern instructional methods that contribute to improving motor learning and developing mental abilities associated with skill performance, in line with scientific progress and quality requirements of educational outcomes in colleges of physical education and sports sciences.

contemporary world is witnessing rapid development in knowledge and educational sciences, which has directly influenced teaching and learning methods. Education is no longer limited to traditional transmission of information; rather, it focuses on building learners' knowledge and developing their cognitive and mental abilities alongside skill and physical aspects. Cognitive learning is considered one of fundamental pillars of modern educational processes due to its effective role in organizing learning experiences and linking new information with prior knowledge, thus achieving meaningful and lasting learning.

In field of sports, particularly gymnastics, learning process requires a precise understanding of stages of motor performance and neuromuscular coordination, in addition to comprehending mechanical relationships of movement. This makes adoption of cognitive instructional models a pressing necessity to facilitate learning and improve performance quality. Modern instructional models, including Klossmeier cognitive instructional model, have contributed to a qualitative shift in teaching methods by focusing on cognitive sequencing and developing organized thinking in learners. Therefore, Amal Hassan Ibrahim (2024) views Klossmeier model

as “an instructional framework that organizes internal and external conditions of teaching and learning according to educational and instructional objectives, with aim of acquiring knowledge and skills through well-defined and systematic steps” (Amal, 2024, p. 337).

Meanwhile, Hadeel Sajid Ibrahim (2009) considers it “a model adopted by Klossmeier for purpose of facilitating teaching and simplifying concepts for learners, and it includes two fundamental skills: concept analysis and example analysis” (Hadeel, 2009, p. 234).

Gymnastics is considered one of individual sports characterized by complex skills and precise technical requirements. horizontal bar is one of most difficult apparatuses in terms of motor performance, as it requires muscular strength, flexibility, coordination, and a correct understanding of movement trajectory and timing. Students of College of Physical Education and Sports Sciences often face difficulties in learning horizontal bar skills due to reliance on traditional methods that emphasize explanation and demonstration without adequate attention to cognitive aspect and gradual skill analysis.

importance of this research lies in fact that Klossmeier cognitive instructional model relies on classifying cognitive learning levels from simple to complex, helping students move systematically from initial understanding to application and mastery. It also allows learners to connect theoretical knowledge with practical performance and enhances their ability to self-correct errors, positively affecting learning speed and performance accuracy. Furthermore, this research seeks to employ a modern cognitive instructional model in teaching gymnastics skills, particularly on horizontal bar, which is considered one of most educationally challenging apparatuses. research contributes to enriching scientific field by presenting an applied cognitive framework that demonstrates effectiveness of Klossmeier model in improving skill-learning process.

1.2 Research Problem

Teaching gymnastics skills, especially horizontal bar skills, requires an integration of cognitive understanding and precise motor performance due to complexity and multiplicity of performance phases. In educational reality of colleges of physical education and sports sciences, some instructors still rely on traditional teaching methods that focus on demonstration and repetition

without providing students with sufficient opportunities for cognitive understanding and skill analysis. This often leads to slow learning, frequent technical errors, and weak linkage between theoretical knowledge and practical application during performance on horizontal bar.

Based on researcher's experience in gymnastics, a clear deficiency was observed in employing modern cognitive instructional models within gymnastics lessons. This deficiency limits effectiveness of teaching horizontal bar skills to students. absence of gradual cognitive organization in presenting skills and failure to consider students' different levels of understanding contribute to low skill mastery and unstable performance. Hence, need emerged to adopt Klossmeier cognitive instructional model as a means of organizing educational content according to graded cognitive levels, which may positively enhance learning certain horizontal bar skills and address shortcomings of traditional methods.

1.3 Research Objective

1. To identify effect of Klossmeier cognitive instructional model on teaching certain skills on horizontal bar in gymnastics to students of College of Physical Education and Sports Sciences.

1.4 Research Hypothesis

1. There is a positive effect of Klossmeier cognitive instructional model on teaching certain skills on horizontal bar in gymnastics to students of College of Physical Education and Sports Sciences.

1.5 Research Domains

- Human domain: Third-year students in College of Physical Education and Sports Sciences – University of Baghdad.
- Spatial domain: Gymnastics hall at College of Physical Education and Sports Sciences – University of Baghdad.
- Temporal domain: From 5/1/2025 to 18/3/2025.

2.1 Research Method

experimental method was employed using equivalent groups design (control and experimental) to achieve objectives of research and address its problem. As Haider Abdul Razzaq (2015) states, "Experimentation investigates cause and how it occurs. researcher examines variables of phenomenon under study, deliberately introduces changes to some of them, and controls other related variables in order to determine their effect on one or more dependent variables; in other words, to identify causal relationships between independent and dependent variables" (Haider, 2015, p. 82).

2.2 Research Community and Sample

research community consisted intentionally of third-year students at College of Physical Education and Sports Sciences, University of Baghdad, totaling (180) students. A sample of (20) students representing one class section was selected, constituting (11.11%) of original community. sample was randomly divided into two groups (control and experimental), with (10) students in each group. two samples within each group were homogenized using coefficient of variation as shown in Table (1), and equivalence of two groups was verified using t-test for independent samples, as shown in Table (2).

Table (1)

It shows homogeneity of two samples within group using coefficient of variation in required measurements.

Variables	Measurement unit	Control group			Experimental group		
		Mean	St.d	Coefficient of variation	Mean	St.d	Coefficient of variation
Height	Cm.	172.2	1.475	0.856	172.42	1.562	0.905
Weight	Kg.	71.23	0.896	1.257	71.56	0.964	1.347
Age	Year	21.412	0.756	3.53	21.536	0.526	0.442

Table (2)

It shows homogeneity and equivalence of control and experimental groups in research variables.

Variables	Measurement unit	Control group		Experimental group		Calculated (t) value	Sig. level	Sig. type
		Mean	St.d	Mean	St.d			
Preparatory phase	Score	3.142	0.435	3.241	0.521	0.438	0.455	Sig.
Main phase	Score	3.526	0.652	3.462	0.471	0.238	0.334	Sig.
Final phase	Score	3.42	0.532	3.513	0.621	0.341	0.414	Sig.
Full movement	Score	3.362	0.454	3.404	0.433	0.2	0.31	Sig.

2.3 Data Collection Tools

2.3.1 Data collection methods:

1. Sources and references.
2. Scientific observation.

2.3.2 Devices and tools used:

1. Standard gymnastics hall.
2. Horizontal bar apparatus.
3. Stopwatch.
4. Measuring tape.
5. Medical scale.
6. Bench.

2.4 Field Procedures

2.4.1 Skill Identification

researcher identified technical phases of horizontal bar skill, namely kip movement, which is included in gymnastics curriculum followed in colleges and departments of physical education and sports sciences.

2.4.2 Performance Evaluation

Performance evaluation of kip movement on horizontal bar was conducted by three experts, and arithmetic mean of their scores was taken for each phase of movement. Each phase was allocated 10 points, and complete movement was also allocated 10 points.

Sections (phases of movement) (Ma'yūf, 1985: 173)

1. Preparatory Phase: player stands a short distance from horizontal bar and grips it (bar of horizontal bar apparatus) with a shoulder-width overhand grip. With arms fully extended, player raises both legs together while keeping them joined, lifting hips by flexing hip joints. body is then slightly swung forward while extending hip joints (reaching full extension). At front still point, hip joints are flexed quickly until insteps approach bar to assume correct kip position. It is noted that arms remain extended and gaze is directed toward bar.
2. Main Phase: body swings backward while in kip position up to vertical level. Then hip joints are extended while legs slide close to bar up to hip joints, accompanied by turning hands. After stopping hip extension movement, trunk leans forward with a turning of hands.
3. Final Phase: By stopping extension movement, kinetic energy transfers from legs to trunk, enabling player to reach front support position. This is achieved by extending hip joints either forcefully or slowly, depending on movement that follows.

Table (3)

It shows evaluation scores for technical performance on horizontal bar.

Movement parts	Preliminary	Main	Final	Full movement
Degree	10	10	10	10

2.4.3 Exploratory experiment

An exploratory experiment was conducted on 5/1/2025 in gymnastics hall at College of Physical Education and Sports Sciences using same sample to

standardize exercises, identify training load components, and determine students' ability to perform exercises and difficulties they faced.

2.5 Main Experiment

- Pre-tests: Conducted on 19/1/2025.
- Application of Klossmeier instructional model: Educational exercises were prepared and applied according to four levels of Klossmeier model which are: (Joudat, Jamal, 1998: 395)

    1. Concrete level
    2. Identity and matching level
    3. Classification level
    4. Formalization level

These exercises were implemented in main part of instructional unit during a complete lesson with its three sections (see Appendix (1)) for a period of eight weeks, at a rate of two instructional units per week. program began on 20/1/2025 and its implementation concluded on 17/3/2025.

- Post-tests: Conducted on 18/3/2025.

2.6 Statistical Methods

Statistical Package for Social Sciences (SPSS) was used to process data statistically.

3. Discussion of Results

Table (4)

It shows results of t-tests between arithmetic means of pre- and post-evaluations for control group.

Evaluation Used	Measurement unit	Pre-test		Post-test		Standard Error	Calculated t-value	Sig. level	Sig. type
		Mean	St.d	Mean	St.d				
Preparatory phase	Score	3.142	0.435	5.142	0.745	0.774	2.583	0.00	Sig.
Main phase	Score	3.526	0.652	5.231	0.685	0.627	2.719	0.00	Sig.
Final phase	Score	3.42	0.532	5.221	0.711	0.698	2.58	0.00	Sig.

Full movement	Score	3.362	0.454	5.198	0.764	0.655	2.80	0.00	Sig.

Table (5)

Shows results of t-tests between arithmetic means of pre- and post-evaluations for experimental group.

Variables	Measurement	Pre-test		Post-test		Standard Error	Calculated t-value	Sig. level	Sig. type
		Mean	St.d	Mean	St.d				
Preparatory phase	Score	3.241	0.521	7.141	0.812	0.874	4.462	0.00	Sig.
Main phase	Score	3.462	0.471	7.235	0.745	0.985	3.83	0.00	Sig.
Final phase	Score	3.513	0.621	7.458	0.678	0.949	4.157	0.00	Sig.
Full movement	Score	3.404	0.433	7.278	0.722	0.948	4.086	0.00	Sig.

Table (6)

Shows results of t-tests between post-test arithmetic means of control and experimental groups

Variables	Measurement	Control group		Experimental group		Calculated t value	Sig. level	Sig. type
		Mean	St.d	Mean	St.d			
Preparatory phase	Score	3.142	0.745	7.141	0.812	5.446	0.00	Sig.
Main phase	Score	5.231	0.685	7.235	0.745	5.946	0.00	Sig.
Final phase	Score	5.221	0.711	7.458	0.678	6.84	0.00	Sig.
Full movement	Score	5.198	0.764	7.278	0.722	5.942	0.00	Sig.

Through observing Tables (4) and (5), it is evident that there are statistically significant differences between pre- and post-tests for both control and experimental groups in evaluating technical performance on horizontal bar. calculated t-values were greater than tabulated values, which indicates success of both groups in learning and developing skills. Qasim Lazzam (2005) confirms that “learning within an educational curriculum applied

objectively leads to increased learning and consequently to skill development in both cognitive and skill domains" (Qasim, 1996: 56).

Meanwhile, Saad Mohsen (1996) states " educational program inevitably leads to improved achievement if it is built on a scientific basis in organizing and programming learning process, using appropriate and progressively challenging methods, considering individual differences, and employing effective instructional aids under supervision of specialized trainers and within suitable educational conditions in terms of place, time, and equipment" (Saad, 1996: 98).

From observing Table (6), it becomes clear that experimental group outperformed control group in applying instructional exercises according to Robert Gagne's colleague Herbert Klausmeier educational model (Klausmeier Model), which strengthened instructional aspect through proper cognitive foundations. This study is consistent with study of Mahmoud Afifi and Lubna Ali (2009), which indicated that " use of Klausmeier Model in teaching helps in acquiring scientific concepts" (Mahmoud & Lubna, 2009: 86).

In gymnastics, especially on horizontal bar, this model played a major role in learning. Mohamed Ibrahim Shehata (2006) states that "gymnastics depends on learner's ability to perform exercises and movements characterized by difficulty and, at same time, correct aesthetic form" (Mohamed, 2006: 35).

In study by Esraa Hussein Ali et al. (2019), which highlighted role of Klausmeier Model in "education, especially in gymnastics, as it helps elevate level of learning and understanding, being cornerstone in comprehending and developing skill" (Esraa, 2019: 140).

4.1 Conclusions

Klossmeier cognitive instructional model is important and fundamental in teaching certain horizontal bar skills in gymnastics to students of College of Physical Education and Sports Sciences. Dividing movement into parts and understanding its details across multiple levels facilitates correct learning and raises required cognitive level in teaching technical performance on horizontal bar.

4.2 Recommendations

Adopting Klossmeier cognitive instructional model due to its importance and fundamental role in teaching certain horizontal bar skills in gymnastics. Emphasizing division of movements into parts and understanding their details across multiple levels to enhance correct learning and cognitive development in teaching horizontal bar performance.

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Appendix (1)

Sample of Educational Units

Week: First Total Time: 40-42 minutes

Educational Unit: 1-2 Unit Goal: Teaching skill of somersault on horizontal bar

Section	Exercise Time	Exercise Number	Size	Notes and Issues
Application		Explanation and demonstration of skill via video and practical application.		Emphasize Klossmeier Model
	1.30 min	1. With shoulder and abdominal contraction for (10-20 seconds) to strengthen grip and shoulders, perform front and back swings.	3*6	Emphasize cognitive aspect
	2.10 min	2. Hang while performing light body swings forward and backward, maintaining straight arms, and raising legs high from	5*3	

		hang.		
	2.10 min	3. From hanging position, raise legs forward to hip level or higher to increase abdominal strength.	5*3	
	2.24 min	4. From hang, raise legs and try to touch bar with feet to learn quick bending movement.	5*3	
	2.20 min	5. Perform complete somersault with light assistance; teacher assists only at moment of transition from raising legs to pressing arms.	4*5	
	2.30 min	6. Perform complete somersault without assistance.	5*3	