

## The Effectiveness Of The Woods Model According To Biggs' Levels (Surface, Deep, and Achieving) In Learning Some Basic Fencing Skills Among Students

Malik Jamal Abd Naser<sup>1</sup>

<sup>1</sup> University of Anbar, College of Physical Education and Sports Sciences, Iraq.

### ABSTRAK

Penelitian ini bertujuan untuk menyelidiki efektivitas Model Woods sebuah model pembelajaran yang terdiri dari tiga tahapan (Prediksi, Observasi, dan Interpretasi) yang diterapkan berdasarkan tingkat pembelajaran Biggs (Permukaan, Mendalam, dan Pencapaian) dalam mempelajari keterampilan dasar anggar terpilih (Mundur, Maju, dan Lunge) di kalangan mahasiswa tingkat pertama pada Fakultas Ilmu Pendidikan Jasmani dan Olahraga, Universitas Anbar. Peneliti menggunakan metode eksperimen dengan desain tiga kelompok yang ukurannya tidak sama. Sampel dipilih secara acak dari satu kelas dan terdiri dari (36) mahasiswa, yang diklasifikasikan berdasarkan Kuesioner Proses Pembelajaran Biggs ke dalam tiga kelompok (Permukaan, Mendalam, dan Pencapaian). Program pembelajaran diterapkan melalui satu unit pembelajaran per minggu selama periode (12) minggu. Setelah pelaksanaan pre-test dan post-test, serta pengolahan data secara statistik menggunakan *Statistical Package for the Social Sciences* (SPSS), hasil penelitian menunjukkan adanya perbedaan yang signifikan secara statistik antara hasil pre-test dan post-test yang mengungguli post-test pada semua kelompok. Selain itu, kelompok pembelajaran mendalam (*Deep-learning*) mengungguli kelompok permukaan (*Surface*) dan pencapaian (*Achieving*) pada ketiga keterampilan tersebut, sementara tidak ditemukan perbedaan yang signifikan antara kelompok permukaan dan pencapaian. Peneliti merekomendasikan untuk mengadopsi Model Woods dalam pengajaran keterampilan motorik dengan tetap mempertimbangkan gaya belajar mahasiswa.

**Kata Kunci:** Model Woods, Tingkat Pembelajaran Biggs, Pembelajaran Mendalam, Pembelajaran Permukaan, Pembelajaran Pencapaian.

### ABSTRACT

*This study aimed to investigate the effectiveness of the Woods Model an instructional model comprising three stages (Prediction, Observation, and Interpretation) applied according to Biggs' levels of learning (Surface, Deep, and Achieving) in learning selected basic fencing skills (Retreat, Advance, and Lunge) among first-stage students at the College of Physical Education and Sports Sciences, University of Anbar. The researcher employed the experimental method using a design of three unequal-sized groups. The sample was selected randomly from one section and consisted of (36) students, who were classified according to the Biggs Learning Process Questionnaire into three groups (Surface, Deep, and Achieving). The instructional program was implemented through one instructional unit per week over a period of (12) weeks. Following the administration of pre- and post-tests, and statistical treatment of the data using the Statistical Package for the Social Sciences (SPSS), the results revealed statistically significant differences between the pre-test and post-test results in favor of the post-tests across all groups. Moreover, the Deep-learning group outperformed both the Surface and Achieving groups in all three skills, while no significant differences were found between the Surface and Achieving groups. The researcher recommends adopting the Woods Model in teaching motor skills while taking students' learning styles into consideration.*

**Keywords:** Woods Model, Biggs' Levels of Learning, Deep Learning, Surface Learning, Achieving Learning.

## INTRODUCTION

In sports education, learning closely connect with how student acquire, develop, and maintain motor skill. Process not only about repeat a movement until it become familiar. Practice condition, instructional guidance, feedback, attentional focus, plus cognitive engagement can all shape how motor skill learn (Tahchi et al., 2024; Barzyk & Gruber, 2024; Choo et al., 2024). Because of these factor, traditional instruction increasingly combine with approach that give learner more active role. Student are given opportunity for work with learning task, make decision, control part of learning, and gradually improve their motor performance.

One model that follow this kind of learning process is Woods Model. Model move through three stage: prediction, observation, and explanation. Student first use previous knowledge for predict what may happen within learning task. They then observe demonstration or learning activity before explain what they have see. During this last part, new information connect with what student already know. This sequence relate toward constructivist view, where learner build understanding through active participation instead of only receive information from teacher. Recent research also continue describe constructivism through participation and knowledge construction (Dahl & Mørch, 2025). Within Woods Model, these stage can encourage interaction, help student recognize misconception, and support cognitive development (Woods, R. 1994).

Student, however, do not approach same learning task within exactly same way. Difference can see within intelligence, comprehension, motivation, previous knowledge, plus learning preference. These difference can make one teaching method become less suitable for some learner than other. Biggs Model provide way for understand such difference by focus toward how student approach learning task and how their characteristic relate toward learning environment. Biggs describe three approach: surface, deep, and achieving (Lamia Hassan Al-Diwan et al., 2019). These category can help explain

why student who receive same instruction may still show different learning result.

Biggs Model have apply within different educational setting and not restrict toward one academic field. Within sports education, model can also use for understand how student deal with learning task and organize their learning. It may provide teacher with clearer picture about difference among learner and help them consider these difference when preparing instruction.

Issue become more noticeable within motor learning because student may differ within how they process information, respond toward feedback, use previous experience, and stay motivate during practice. As result, an instructional strategy that work for one learner may not produce same response from another learner. Research on skill acquisition also suggest that practice and instructional strategy can depend toward learner characteristic, skill level, plus task demand (Choo et al., 2024; Nijmeijer et al., 2025). These difference need consider when designing learning activity for motor skill.

Fencing provides a suitable setting for examining these differences because it is an individual sport that requires the integration of technical movement, timing, balance, coordination, and accuracy. Basic skills such as retreating, advancing, and lunging may appear relatively simple to observe, yet their effective execution requires precise coordination, repeated practice, and continuous adjustment (Jiang, 2026). Within this context, the present study combines the Woods Model, which emphasizes active learning through prediction, observation, and explanation, with Biggs' learning approaches, particularly surface, deep, and achieving/strategic approaches, to examine students' learning processes in selected basic fencing skills. Recent studies confirm that students' approaches to learning can be distinguished into deep, surface/unreflective, and organised or strategic approaches, with these approaches reflecting differences in how students process, organise, and engage with learning tasks (Kok et al., 2024; Häsä et al., 2024).

Before sport skill can become stable, learner have to go through process of practice and adjustment. Motor learning refer toward relatively lasting change within ability for perform movement as result of practice and

experience. This process affect by how practice organize, type of feedback provide, where attention direct, cognitive strategy use by learner, plus demand of both learner and task (Barzyk & Gruber, 2024; Nijmeijer et al., 2025).

Difference between student also find during researcher observation of fencing class at College of Physical Education and Sports Sciences, University of Anbar. Student follow same instructional program and teach under similar condition, yet their performance accuracy not same. Some student perform technique more accurately, while other show more error or less stable movement. This situation raise possibility that difference within how student approach learning may relate toward their motor learning.

Several instructional program have use for teach fencing skill, but there still need for examine whether Woods Model can produce change within specific motor learning indicator. In particular, its possible contribution toward accuracy, stability, fluency, plus error reduction within selected fundamental fencing skill have not sufficiently examine within university setting.

Based on this situation, study focus toward following question:

Does Woods Model improve motor learning within selected fundamental fencing skill among student of College of Physical Education and Sports Sciences at University of Anbar, and does effect differ between student with surface, deep, and achieving learning approach according toward Biggs?

Study design around two main objective. First is for develop instructional unit using Woods Model and organize them according toward Biggs learning approach for teaching selected basic fencing skill. Second is for examine effectiveness of this model for student with three learning approach within learning retreating, advancing, and lunging.

Within Woods Model, learning move through prediction, observation, and explanation. Prediction give student opportunity for recall what they already know and use that knowledge before performing task. Observation then direct

their attention toward demonstration or actual learning activity. During explanation, student make sense about what they observe by relate new information toward previous knowledge. This sequence reflect constructivist learning, where understanding develop through learner own involvement (Dahl & Mørch, 2025). Within present study, three stage use when teaching retreating, advancing, and lunging within basic foil fencing.

Three approach within Biggs Model describe different way of dealing with learning task. Surface approach usually focus toward completing basic requirement, with less attention toward deeper meaning. Student using deep approach tend for search meaning, connect new information with previous knowledge, and try for understand material more fully. Achieving approach place greater attention toward organizing and managing learning activity for reach expected result. Biggs framework continue use for examine difference within learning approach, motivation, plus learning process (Educational Psychology Review, 2024; 2025). Within this study, three approach use for classify student before compare their learning of selected fencing skill.

Explanation stage is where student begin connect observation with understanding. What they have see not leave as simple visual experience. They expect for interpret movement and relate it toward knowledge or experience they already possess (Joyce, B., Weil, M., & Calhoun, E., 2009). For present study, this stage use for help student understand technical action involve within retreating, advancing, and lunging.

Biggs classification then use for distinguish student according toward way they approach learning. Surface group tend for concentrate toward basic task requirement, while deep group give more attention toward understanding and making connection. Student within achieving group more concern with organizing their learning for obtain expected outcome. These difference provide basis for examine whether student with different learning approach respond differently toward Woods Model during fencing instruction.

## RESEARCH METHOD

Study use experimental design with student place into group according toward Biggs learning approach. Participant are third-year student of College of Physical Education and Sports Sciences, University of Anbar, during 2025-2026 academic year. Research take place within Fencing Hall between September 10 and December 30, 2025. Experimental method commonly use within sports research when aim is examine effect of planned intervention toward motor performance or skill development (Fahreza et al., 2026; Yang et al., 2024).

There are 90 student within research population, divide equally among three section, A, B, and C. Each section contain 30 student. Section B choose randomly for become experimental sample. Student then classify into surface, deep, and achieving group using Biggs Learning Approaches Inventory. Similar instrument based on Biggs framework have use within recent research for distinguish learning approach among student (Avraam et al., 2025; Paloş et al., 2025).

Before main experiment, pilot study carry out with 10 student from Section C. This preliminary stage use for check whether procedure and instrument can implement as planned. It also provide opportunity for identify practical problem before main data collection. Pilot study of this kind commonly use within sports research when testing intervention procedure and measurement protocol (Yang et al., 2024). Population and sample distribution show within Table 1.

Table 1. Description of the Distribution of the Research Sample According to Biggs' Learning Approaches

| Section | Number of Students | Surface Group | Deep Group | Achieving Group |
|---------|--------------------|---------------|------------|-----------------|
| A       | 36                 | 18            | 8          | 10              |

### Homogeneity Of The Research Sample

Table 2. Homogeneity of the Research Sample Using the Coefficient of Variation (n = 30)

| Variables | Unit of Measurement | Mean | Median | Standard | Skewness |
|-----------|---------------------|------|--------|----------|----------|
|-----------|---------------------|------|--------|----------|----------|

|        | element |     |     | Deviation | Coefficient |
|--------|---------|-----|-----|-----------|-------------|
| Height | cm      | 177 | 178 | 4.14      | 0.50        |
| Weight | kg      | 74  | 75  | 5         | 0.60        |
| Age    | months  | 288 | 287 | 16        | 0.30        |

Characteristic of selected sample also check before main experiment. Table 2 show that coefficient of variation for all variable below 30%. This indicate that participant sufficiently homogeneous for variable include within study.

Data collect through several source and procedure. Arabic and foreign reference, online material, test and measurement, plus Biggs Learning Approaches Inventory use during research. Assisting research team also support data collection. Equipment include medical weighing scale, three Casio stopwatch, Toshiba laptop, 30 fencing foil, measuring tape, four whistle, plus data projector. Projector use for display technical performance model during instruction.

### Skill Performance Tests

Preparation of study involve both theoretical review and practical examination of fencing instruction. Researcher examine Arabic and foreign scientific literature together with previous study related toward fencing. View of expert and specialist within teaching basic foil fencing skill also consider. Based on this material, performance assessment procedure select for determine level of student skill acquisition.

For evaluate selected fencing skill, performance assessment use as main measurement method. Assessment focus toward advancing, retreating, and lunging. Each movement judge according toward technical performance, so evaluator need recognize whether student carry out required movement correctly. Method therefore depend on established technical criterion plus assessor ability for observe motor performance.

Performance assessment form within Appendix 1 take from Sabbār Jamāl 'Abd (2006). Each skill give maximum score of 10 point according toward quality of student performance. Several judge assess student, and arithmetic mean of their score use as final performance score. This procedure apply for provide more representative measure of each student actual skill performance (Helmy et al.,

2024).

## Field Research Procedures

### Pilot Study

To verify the feasibility and effectiveness of the research procedures, the researcher conducted a pilot study on Sunday, September 12, 2025, involving a pilot sample of 10 students. The objectives of the pilot study were as follows:

1. To determine the amount of time required to administer each test.
2. To familiarize the assisting research team with their respective tasks and responsibilities.
3. To identify and avoid any obstacles that might be encountered by the participants during testing.
4. To familiarize the research sample with the testing procedures.
5. To determine the total time required for the main experiment.

### Pre-Test

After preparing the instruments and recording forms, the assisting research team, under the supervision of the researcher, administered the pre-tests to the three research groups on Sunday, September 21, 2025.

After the data were collected, they were submitted to a group of experts and judges and statistically analyzed using the statistical package through analysis of variance (ANOVA). The equivalence of the three groups was then examined.

The results indicated that there were no statistically significant differences among the groups, as the calculated F-values for the research variables were lower than the tabulated F-value of 3.35 at a significance level of 0.05 and degrees of freedom of (2, 27). This indicates that the three groups were equivalent, as shown in Table 3.

Table 3. Equivalence of the Three Research Groups (Surface, Deep, and Achieving) in the Study Variables

| Variable | Source of Variation | Sum of Squares | df | Mean Square | F-value | Sig. | Significance    |
|----------|---------------------|----------------|----|-------------|---------|------|-----------------|
| treating | Between Groups      | 4.37           |    | 2.18        | 3.209   | .053 | Not significant |

|           |                |        |    |       |       |      |                 |
|-----------|----------------|--------|----|-------|-------|------|-----------------|
|           | ps             |        |    |       |       |      |                 |
|           | thin Groups    | 22.51  | 33 | .68   |       |      |                 |
| Advancing | Between Groups | .581   |    | .290  | .320  | .729 | Not significant |
|           | Within Groups  | 29.975 | 33 | .908  |       |      |                 |
| Lunging   | Between Groups | 3.656  |    | 1.828 | 1.392 | .263 | Not significant |
|           | Within Groups  | 43.344 | 33 | 1.313 |       |      |                 |

*Note: Differences are considered statistically significant at an error level of 0.05.*

It is evident from Table 3 that there were no statistically significant differences in the pre-test results among the three groups (surface, deep, and achieving). The Sig. values were greater than 0.05 for all study variables, indicating that the three groups were equivalent before the implementation of the experimental treatment.

### Orientation Session

Prior to implementing the main experiment, an orientation session was provided for the students in the three research groups. The session was conducted by the fencing instructor, Assistant Professor Dr. Salah Hadi Hammad, on September 27, 2025. The session aimed to:

1. Provide students with a comprehensive understanding of the lesson plan based on the Woods Model.
2. Introduce students to the Woods Model, including its procedures and applications.
3. Ensure the suitability and safety of the prepared exercises and their compatibility with the students' curriculum.

### Basic Steps For Developing The Woods Model-Based Instructional Program

After reviewing Arabic and foreign sources, references, and previous studies addressing the Woods Model, including the study by Shandukh (2023) and the study by 'Abd al-Amir (2019), the researcher was able to develop and organize the instructional units and determine their behavioral, instructional,

and educational objectives.

The instructional program was implemented over 12 weeks, with one instructional unit delivered per week, resulting in a total of 12 instructional units. The units were integrated into the weekly fencing course schedule at the college and were conducted every Sunday. The following considerations were taken into account:

1. Diversifying the exercises and varying their formations and methods of execution.
2. Allowing students to discover errors in their technical performance and work toward correcting them by referring to the display screen to observe the correct model of technical performance.
3. Ensuring that the three stages of the Woods Model were implemented sequentially.
4. Ensuring that the questions directed to students were related to the technical performance of the skill being taught and were clear and uncomplicated in order to develop students' ability to predict and think about the skill.
5. Taking into account the students' theoretical and practical levels.
6. Ensuring that all three groups followed the same instructional program and lesson plan in all its components.

The instructional unit lasted 90 minutes and consisted of the following sections:

#### A. Preparatory Section 20 Minutes

This section addressed administrative and organizational procedures and prepared the students' bodies for the main part of the instructional unit. It included:

1. Introduction 5 minutes: Recording student attendance, providing encouraging statements to promote persistence, and initiating the lesson.
2. General Warm-Up 5 minutes: Performing various prepared activities and exercises aimed at developing physical abilities, including walking, running,

jumping, and speed exercises.

3. Specific Warm-Up 10 minutes: Performing warm-up exercises specifically designed according to the characteristics of the skill being learned while taking into account the sequential development of different motor abilities.

#### B. Main Section 60 Minutes

The main section consisted of two components:

##### 1. Skill Instruction 20 Minutes

The instructor provided a detailed explanation of the skill and demonstrated the technical method of execution using a display screen and instructional boards showing the correct performance model.

The students were then divided into four fixed groups, after which the instructor implemented the stages of the Woods Model.

The process began with the prediction stage, in which students focused on their previous experiences and drew upon them to conceptualize the skill and its components in response to a question posed by the instructor.

This was followed by the observation stage, during which students were allowed to discuss and reflect on the skill being learned and comprehend it through auditory and visual perception. Subsequently, one member of each group was allowed to provide an answer freely and without pressure.

The final stage was the explanation stage, in which, after understanding the skill, students provided an explanation of the question posed by the instructor. This process helped them recognize and understand the correct technical performance.

##### 2. Practical Exercise Component 40 Minutes

During this component, the instructor systematically implemented the exercises with the students while providing feedback during or after performance, particularly when errors occurred in executing the skill.

Students were allowed to approach the display screen to observe the model performance and then return to correct their own performance. They were also free to ask the instructor questions regarding any aspect of the skill.

After completing the exercises, the students performed an exercise designed to assess their performance. The practical component of each instructional unit included

three exercises plus one assessment exercise.

### C. Closing Section 10 Minutes

The closing section aimed to return the students' bodies to their normal physiological state through relaxation and cool-down exercises, followed by a recreational game.

Afterward, students were given a question related to the skill of the upcoming instructional unit as a homework assignment. The lesson concluded with the students standing in formation and performing the customary salute.

### Implementation Of The Main Experiment

The Woods Model-based instructional program was implemented beginning on Sunday, September 21, 2025, and was completed on Sunday, December 21, 2025.

### Post-Test

After completing the experimental instructional program, the assisting research team administered the post-tests for the selected skills to the three research groups on December 28, 2025.

The post-tests were conducted under the same conditions and procedures as the pre-tests to ensure consistency. The resulting data were subsequently subjected to statistical analysis.

### STATISTICAL METHODS

The Statistical Package for the Social Sciences (SPSS) was used to process and analyze the research data.

### DISCUSSION OF THE RESULTS

Results of the Fundamental Skill Tests: Pre-Test and Post-Test of the Experimental Group (Surface Approach)

Table 4. Pre-Test and Post-Test Results of the Surface Approach Group on the Study Variables

| V<br>ar<br>ia<br>bl<br>e                       | Me<br>as<br>ur<br>em<br>ent<br>Un<br>it | P<br>r<br>e<br>-<br>T<br>e<br>s<br>t<br>M<br>e<br>a<br>n | P<br>r<br>e<br>-<br>T<br>e<br>s<br>t<br>S<br>t<br>a<br>n<br>d<br>a<br>r<br>d<br>D<br>e<br>v<br>i<br>a<br>t<br>i<br>o<br>n | P<br>o<br>s<br>t<br>-<br>T<br>e<br>s<br>t<br>M<br>e<br>a<br>n | P<br>o<br>s<br>t<br>-<br>T<br>e<br>s<br>t<br>S<br>t<br>a<br>n<br>d<br>a<br>r<br>d<br>D<br>e<br>v<br>i<br>a<br>t<br>i<br>o<br>n | M<br>e<br>a<br>n<br>D<br>i<br>f<br>f<br>e<br>r<br>e<br>n<br>c<br>e | S<br>t<br>a<br>n<br>d<br>a<br>r<br>d<br>D<br>e<br>v<br>i<br>a<br>t<br>i<br>o<br>n | S<br>i<br>g<br>n<br>i<br>f<br>i<br>c<br>a<br>n<br>c<br>e | S<br>i<br>g<br>n<br>i<br>f<br>i<br>c<br>a<br>n<br>c<br>e |
|------------------------------------------------|-----------------------------------------|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------|
| R<br>e<br>t<br>r<br>e<br>a<br>t<br>i<br>n<br>g | S<br>c<br>o<br>r<br>e                   | 4<br>.<br>7<br>2                                         | 0<br>.<br>9<br>5                                                                                                          | 6<br>.<br>2<br>7                                              | 0<br>.<br>8<br>9                                                                                                               | 1.<br>55                                                           | 1.<br>29                                                                          | 5<br>.<br>1<br>0                                         | S<br>i<br>g<br>n<br>i<br>f<br>i<br>c<br>a<br>n<br>t      |
| A<br>d<br>v<br>a<br>n<br>c<br>i<br>n<br>g      | S<br>c<br>o<br>r<br>e                   | 4<br>.<br>5<br>0                                         | 0<br>.<br>9<br>8                                                                                                          | 6<br>.<br>1<br>1                                              | 0<br>.<br>7<br>5                                                                                                               | 1.<br>61                                                           | 1.<br>28                                                                          | 5<br>.<br>3<br>0                                         | S<br>i<br>g<br>n<br>i<br>f<br>i<br>c<br>a<br>n<br>t      |
| L<br>u<br>n<br>g<br>i<br>n<br>g                | S<br>c<br>o<br>r<br>e                   | 4<br>.<br>9<br>4                                         | 1<br>.<br>3<br>9                                                                                                          | 5<br>.<br>8<br>3                                              | 0<br>.<br>7<br>0                                                                                                               | 0.<br>88                                                           | 1.<br>45                                                                          | 2<br>.<br>6<br>0                                         | S<br>i<br>g<br>n<br>i<br>f<br>i<br>c<br>a<br>n<br>t      |

| V<br>ar<br>ia<br>bl<br>e                       | Me<br>as<br>ur<br>em<br>ent<br>Un<br>it | P<br>r<br>e<br>-<br>T<br>e<br>s<br>t<br>M<br>e<br>a<br>n | P<br>r<br>e<br>-<br>T<br>e<br>s<br>t<br>S<br>t<br>a<br>n<br>d<br>a<br>r<br>d<br>D<br>e<br>v<br>i<br>a<br>t<br>i<br>o<br>n | P<br>o<br>s<br>t<br>-<br>T<br>e<br>s<br>t<br>M<br>e<br>a<br>n | P<br>o<br>s<br>t<br>-<br>T<br>e<br>s<br>t<br>S<br>t<br>a<br>n<br>d<br>a<br>r<br>d<br>D<br>e<br>v<br>i<br>a<br>t<br>i<br>o<br>n | M<br>e<br>a<br>n<br>D<br>i<br>f<br>f<br>e<br>r<br>e<br>n<br>c<br>e | S<br>t<br>a<br>n<br>d<br>a<br>r<br>d<br>D<br>e<br>v<br>i<br>a<br>t<br>i<br>o<br>n | S<br>i<br>g<br>n<br>i<br>f<br>i<br>c<br>a<br>n<br>c<br>e | S<br>i<br>g<br>n<br>i<br>f<br>i<br>c<br>a<br>n<br>c<br>e |
|------------------------------------------------|-----------------------------------------|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------|
| R<br>e<br>t<br>r<br>e<br>a<br>t<br>i<br>n<br>g | S<br>c<br>o<br>r<br>e                   | 4<br>.<br>7<br>2                                         | 0<br>.<br>9<br>5                                                                                                          | 6<br>.<br>2<br>7                                              | 0<br>.<br>8<br>9                                                                                                               | 1.<br>55                                                           | 1.<br>29                                                                          | 5<br>.<br>1<br>0                                         | S<br>i<br>g<br>n<br>i<br>f<br>i<br>c<br>a<br>n<br>t      |
| A<br>d<br>v<br>a<br>n<br>c<br>i<br>n<br>g      | S<br>c<br>o<br>r<br>e                   | 4<br>.<br>5<br>0                                         | 0<br>.<br>9<br>8                                                                                                          | 6<br>.<br>1<br>1                                              | 0<br>.<br>7<br>5                                                                                                               | 1.<br>61                                                           | 1.<br>28                                                                          | 5<br>.<br>3<br>0                                         | S<br>i<br>g<br>n<br>i<br>f<br>i<br>c<br>a<br>n<br>t      |
| L<br>u<br>n<br>g<br>i<br>n<br>g                | S<br>c<br>o<br>r<br>e                   | 4<br>.<br>9<br>4                                         | 1<br>.<br>3<br>9                                                                                                          | 5<br>.<br>8<br>3                                              | 0<br>.<br>7<br>0                                                                                                               | 0.<br>88                                                           | 1.<br>45                                                                          | 2<br>.<br>6<br>0                                         | S<br>i<br>g<br>n<br>i<br>f<br>i<br>c<br>a<br>n<br>t      |

*Note: The difference is statistically significant because the Sig. value is less than 0.05, with 17 degrees of freedom.*

The results in Table 4 indicate statistically significant differences between the pre-test and post-test results of the surface approach group in all three fundamental fencing skills: retreating, advancing, and lunging.

Results of the Fundamental Skill Tests: Pre-Test and Post-Test of the Experimental Group (Deep Approach)

Table 5. Pre-Test and Post-Test Results of the Deep Approach Group on the Study Variables

| V<br>ar<br>ia<br>bl<br>e                       | Me<br>as<br>ur<br>em<br>ent<br>Un<br>it | P<br>r<br>e<br>-<br>T<br>e<br>s<br>t<br>M<br>e<br>a<br>n | P<br>r<br>e<br>-<br>T<br>e<br>s<br>t<br>S<br>t<br>a<br>n<br>d<br>a<br>r<br>d<br>D<br>e<br>v<br>i<br>a<br>t<br>i<br>o<br>n | P<br>o<br>s<br>t<br>-<br>T<br>e<br>s<br>t<br>M<br>e<br>a<br>n | P<br>o<br>s<br>t<br>-<br>T<br>e<br>s<br>t<br>S<br>t<br>a<br>n<br>d<br>a<br>r<br>d<br>D<br>e<br>v<br>i<br>a<br>t<br>i<br>o<br>n | M<br>e<br>a<br>n<br>D<br>i<br>f<br>f<br>e<br>r<br>e<br>n<br>c<br>e | S<br>t<br>a<br>n<br>d<br>a<br>r<br>d<br>D<br>e<br>v<br>i<br>a<br>t<br>i<br>o<br>n | S<br>i<br>g<br>n<br>i<br>f<br>i<br>c<br>a<br>n<br>c<br>e | S<br>i<br>g<br>n<br>i<br>f<br>i<br>c<br>a<br>n<br>c<br>e |
|------------------------------------------------|-----------------------------------------|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------|
| R<br>e<br>t<br>r<br>e<br>a<br>t<br>i<br>n<br>g | S<br>c<br>o<br>r<br>e                   | 4<br>.<br>5<br>0                                         | 0<br>.<br>3<br>3                                                                                                          | 7<br>.<br>6<br>2                                              | 0<br>.<br>7<br>4                                                                                                               | 3.<br>12                                                           | 0.<br>83                                                                          | 1<br>.<br>0<br>5<br>9                                    | S<br>i<br>g<br>n<br>i<br>f<br>i<br>c<br>a<br>n<br>t      |
| A<br>d<br>v<br>a<br>n<br>c<br>i<br>n<br>g      | S<br>c<br>o<br>r<br>e                   | 4<br>.<br>3<br>7                                         | 0<br>.<br>9<br>1                                                                                                          | 7<br>.<br>8<br>7                                              | 0<br>.<br>3<br>3                                                                                                               | 3.<br>50                                                           | 1.<br>41                                                                          | 7<br>.<br>0<br>0                                         | S<br>i<br>g<br>n<br>i<br>f<br>i<br>c<br>a<br>n<br>t      |
| L<br>u<br>n<br>g<br>i<br>n<br>g                | S<br>c<br>o<br>r<br>e                   | 5<br>.<br>7<br>5                                         | 0<br>.<br>7<br>0                                                                                                          | 7<br>.<br>8<br>7                                              | 0<br>.<br>3<br>4                                                                                                               | 2.<br>12                                                           | 1.<br>45                                                                          | 4<br>.<br>1<br>2<br>3                                    | S<br>i<br>g<br>n<br>i<br>f<br>i<br>c<br>a<br>n<br>t      |

*Note: The difference is statistically significant because the Sig. value is less than 0.05, with 7 degrees of freedom.*

The results show statistically significant differences between the pre-test and post-test scores of the deep approach group in retreating, advancing, and lunging.

### Results of the Fundamental Skill Tests: Pre-Test and Post-Test of the Experimental Group (Achieving Approach)

Table 6. Pre-Test and Post-Test Results of the Achieving Approach Group on the Study Variables

| Variable   | Measurement Unit | Pre-Test Mean | Pre-Test SD | Post-Test Mean | Post-Test SD | t-value | Sig. | Significance |
|------------|------------------|---------------|-------------|----------------|--------------|---------|------|--------------|
| Retreating | Score            | 3.90          | 0.73        | 5.80           | 0.63         | 8.14    | .000 | Significant  |
| Advancing  | Score            | 4.20          | 0.98        | 5.70           | 0.77         | 4.88    | .001 | Significant  |
| Lunging    | Score            | 5.10          | 0.87        | 5.90           | 0.73         | 2.44    | .037 | Significant  |

*Note: The difference is statistically significant because the Sig. value is less than 0.05, with 9 degrees of freedom.*

The results demonstrate statistically significant differences between the pre-test and post-test scores of the achieving approach group in all three fundamental fencing skills.

### Post-Test Results of the Fundamental Skills among the Research Groups According to Biggs' Learning Approaches (Surface, Deep, and Achieving)

Table 7. Significance of Differences among the Surface, Deep, and Achieving Groups in the Study Variables

| Variable   | Source of Variation | Sum of Squares | df | Mean Square | F-value | Sig. | Significance |
|------------|---------------------|----------------|----|-------------|---------|------|--------------|
| Retreating | Between Groups      | 15.80          | 2  | 7.90        | 12.36   | .000 | Significant  |
|            | Within Groups       | 21.08          | 33 | .639        |         |      |              |
| Advancing  | Between             | 23.80          | 2  | 11.90       | 20.94   | .000 | Significant  |

|         |                |       |    |       |       |      |             |
|---------|----------------|-------|----|-------|-------|------|-------------|
|         | Groups         |       |    |       |       |      |             |
|         | Within Groups  | 18.75 | 33 | .568  |       |      |             |
| Lunging | Between Groups | 25.36 | 2  | 12.68 | 22.90 | .000 | Significant |
|         | Within Groups  | 18.27 | 33 | .554  |       |      |             |

*Note: Differences are statistically significant at an error level of 0.05.*

To determine the significance of differences among the three groups (Surface, Deep, and Achieving) the Least Significant Difference (LSD) test was used to identify the specific group differences in the study variables.

Table 8. Differences in Arithmetic Means and Least Significant Difference (LSD) Values among the Three Groups in the Study Variables

| Variable   | Pairwise Comparison                     | Mean Difference | Sig. | Significance    |
|------------|-----------------------------------------|-----------------|------|-----------------|
| Retreating | Surface (1) – Deep (2) (6.27–7.62)      | 1.34722         | .000 | Significant     |
|            | Surface (1) – Achieving (3) (6.27–5.80) | .47778          | .139 | Not significant |
|            | Deep (2) – Achieving (3) (7.62–5.80)    | 1.82500         | .000 | Significant     |
| Advancing  | Surface (1) – Deep (2) (6.11–7.87)      | 1.76389         | .000 | Significant     |
|            | Surface (1) – Achieving (3) (6.11–5.70) | .41111          | .176 | Not significant |
|            | Deep (2) – Achieving (3) (7.87–5.70)    | 2.17500         | .000 | Significant     |
| Lunging    | Surface (1) – Deep (2) (5.83–7.87)      | 2.042           | .000 | Significant     |
|            | Surface (1) – Achieving (3) (5.83–5.90) | 0.067           | .822 | Not significant |

|  |                                                |       |      |             |
|--|------------------------------------------------|-------|------|-------------|
|  | Deep (2) –<br>Achieving<br>(3) (7.87–<br>5.90) | 1.975 | .000 | Significant |
|--|------------------------------------------------|-------|------|-------------|

#### Interpretation of the LSD Results

For the retreating skill, statistically significant differences were found between the surface and deep groups, with the difference favoring the deep group, as the Sig. value was below the 0.05 significance level. Statistically significant differences were also found between the deep and achieving groups, again favoring the deep group. However, no statistically significant difference was found between the surface and achieving groups, as the Sig. value was greater than 0.05.

For the advancing skill, statistically significant differences were found between the surface and deep groups, favoring the deep group. Significant differences were also found between the deep and achieving groups, again favoring the deep group. No statistically significant difference was observed between the surface and achieving groups because their Sig. value was greater than 0.05.

For the lunging skill, statistically significant differences were found between the surface and deep groups, favoring the deep group. Significant differences were also found between the deep and achieving groups, favoring the deep group. However, no statistically significant difference was found between the surface and achieving groups.

The presentation and analysis of the pre-test and post-test results for the three groups revealed that the differences favored the post-test results. This finding may be attributed to the positive effect of the Woods Model on learning the retreating, advancing, and lunging skills among the surface, deep, and achieving groups.

The effectiveness of the model may be related to its ability to stimulate learners' attention and increase their willingness to learn. The Woods Model is based on principles of constructivist learning theory, which seeks to engage learners' thinking by connecting previous experiences with new learning. Such meaningful learning can enhance memory and facilitate the retrieval of information.

Furthermore, as stated in the source, *“the essential goal of learning is the occurrence of adaptation through synchronizing the learner's cognitive load”* (Schulte, 1996). Through the stages of the Woods Model, learners are able to compare new cognitive information with their previous experiences and subsequently construct predictions before proceeding to the explanation stage. These sequential stages can enable learners to perceive, understand, and optimally retain the skill.

Regarding the LSD results for the post-tests among the three groups, the deep approach group demonstrated higher post-test scores than the surface and achieving groups. This may be related to differences in the way learners process information. Learners adopting a deep approach tend to utilize their cognitive abilities to receive stimuli, process information, and understand its meaning.

Zhang and Sternberg (2000) reported that thinking styles can serve as challenges and effective stimuli in the learning achievement process, while the relationship between deep learning approaches and thinking styles is relatively complex.

The researcher considers this finding to reflect internal factors among learners adopting a deep approach, which may play an important role in their acceptance and cognitive processing of information. This may explain their higher post-test performance compared with the surface and achieving groups, between which no statistically significant differences were observed.

According to the description provided in the source, learners adopting a surface approach tend to invest less effort in understanding meaning and focus primarily on achieving the minimum requirements, including simply completing or passing the course or learning material (Bakr, 2019).

## CONCLUSIONS

The findings showed that the Woods Model had a positive effect on students' learning of retreating, advancing, and lunging skills in fencing across all three learning-approach groups: surface, deep, and achieving. This indicates that the model contributed to improving students' performance in the fencing skills examined.

The deep approach group achieved higher post-test performance than the surface

and achieving groups across all skills. However, no statistically significant differences were found between the surface and achieving groups in the post-test results.

## RECOMMENDATIONS

1. The Woods Model should be adopted in teaching fundamental motor skills in fencing and other sports.
2. Biggs' learning approach (surface, deep, and achieving) should be taken into consideration when designing instructional units and allocating students to learning groups.
3. Similar studies should be conducted on other fencing skills and with samples from different educational levels and academic stages.

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