

The Effect of Skill-Based Exercises Based on the Driver Model on Constructive Thinking and the Acquisition of a Number of Basic Handball Skills

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Article History

Received: 13-06-2026;

Reviewed: 23-07-2026;

Accepted: 02-08-2026;

Published: 07-09-2026;

ABSTRACT

Background: The aim of this study is to develop lesson plans incorporating skill-based exercises based on Driver's model to influence constructive thinking and the acquisition of a number of basic handball skills, and to investigate the impact of skill-based exercises based on Driver's model on constructive thinking and the acquisition of a number of basic handball skills.

Methods: The researcher employed an experimental approach using an experimental and control group design with pre- and post-tests, as this was deemed appropriate for the research problem and objectives. The research population consisted of fourth-year preparatory students at Amr ibn Jundub al-Ghafari Preparatory School, Takrit Education Division, General Directorate of Education for Salah al-Din Governorate, for the 2022/2023 academic year, comprising 84 students distributed across three classes (A, B and C). The research sample was selected at random by drawing lots from sections (B) and (C), comprising 56 students (28 students in each section). The 8 students from the pilot study sample were excluded, leaving 48 students, representing 57.142 per cent of the original research population. They were divided into an experimental group and a control group, with 24 students in each group. After conducting the pre-tests, implementing the teaching plans, carrying out the post-tests and collecting the data, the researcher analysed the data statistically using SPSS software.

Results: The results showed that there was a significant difference between the pre-test and post-test in both groups, but the improvement in the experimental group was higher. The scores of constructive thinking and basic handball skills (handling, dribbling, scoring) were significantly improved in the group using the Driver model compared to the control group.

Conclusions: The study concluded that there is a positive and effective impact of skill-based exercises based on the Driver model on the development of constructive thinking and the acquisition of a number of basic handball skills. The model proved highly effective, motivating students to learn more quickly than with traditional teaching methods. It also contributed to increasing students' enthusiasm for learning and reduced boredom and disengagement from the lesson as a result of their collaboration and their ability to propose and refine ideas, and whilst the control group showed improvement, this was to a lesser extent than that of the experimental group. This demonstrates the effectiveness of the Driver model and the skill-based exercises used in enhancing constructive thinking and the acquisition of a number of basic handball skills.

Keywords: Skill-based exercises, Driver's model, Constructive thinking, Basic handball skills

INTRODUCTION

The world today is witnessing numerous developments in various fields, including sport, where records are being broken. This necessitates that those with an interest in, and those working within, this field keep up to date and stay abreast of developments in order to achieve objectives in line with the demands of the modern age. This is particularly true of the teaching process, which is evolving significantly in terms of the methods used and the ways in which information is conveyed to pupils by the teacher (Jia et al., 2025; Sun, 2024). They form an interdependent triangle comprising the curriculum, the teacher and the pupil; none can function without the others, and recent developments have encompassed the models used in teaching, which have evolved significantly to convey information more quickly, efficiently and effectively.

One such model is the Driver model, which is based on five stages in teaching students. It begins with the orientation stage, involving the presentation of performance models through illustrative aids, followed by the second stage, the 'idea generation' stage, in which students discuss the performance in small groups, putting forward their ideas; then comes the 'idea reformulation' stage, in which the teacher corrects the ideas put forward by the students; the fourth stage involves applying the ideas proposed in the previous stages; and the model concludes with the 'review of changes in ideas' stage (feedback), during which performance is corrected by comparing the information they previously possessed with their current performance and adjusting the students' approach (Hassan et al., 2019; Olimid, 2019).

These stages help to teach and develop students' skill levels in various sports, including handball, which involves numerous fundamental skills, and since Driver's model relies on thinking and the application of ideas, it can also be used to develop constructive thinking in the learning of a number of fundamental handball skills. Whilst numerous research studies have addressed the use of the Driver model, none have specifically focused on the fundamental skills of handball, nor has it been linked to constructive thinking. This research therefore aims to examine the Driver model to identify its impact on constructive thinking and the acquisition of a number of fundamental handball skills (Jabbar et al., 2026).

Constructive thinking is an automatic way of thinking in which the learner uses their information and knowledge to find solutions to situations they encounter in their daily life; the learner applies what they have learnt previously to think through a new situation they face. Thus, the importance of the Driver model lies in its ability to aid learning and convey information in a positive and more effective manner (Alzahrani & Alfadhli, 2023). It stimulates the learner's thinking, enabling them to understand the concept behind the information they receive, its rationale, and how to utilise it most effectively. They discuss this with their peers so that the teacher can assess it, and then apply it correctly whilst comparing current performance with previous expectations of performance to consolidate the information more effectively, which leads to increased self-confidence amongst learners and greater enthusiasm for thinking and finding the most appropriate and effective solutions (Font et al., 2021; Jabbar et al., 2026; Keczelei, 2013; Krieger & Duckworth, 2022; Wurm & Laver, 2018).

The researcher therefore decided to use skill-based exercises based on Driver's model when designing teaching modules to develop constructive thinking and to teach a number of basic handball skills, whilst also investigating the impact of these skill-based exercises on constructive thinking and the acquisition of these basic handball skills, in a serious effort by the researcher to enable students to learn more quickly and efficiently by increasing their motivation to think, to receive new ideas, to discuss them and to correct them whilst comparing them with the correct performance, thereby consolidating accurate knowledge. Hence the importance of this study lies in the development of teaching plans for skill-based exercises based on Driver's model, to determine their impact on constructive thinking and the acquisition of a number of basic handball skills.

METHODS

Participants:

The research population was deliberately selected and comprised fourth-year preparatory students at Amr ibn Jundub al-Ghafari Preparatory School, Takrit Education Department, General Directorate of Education for Salah al-Din Governorate, for the 2022/2023 academic year, totalling 84 students distributed across three classes (A, B and C).

The research sample was selected at random by drawing lots from sections (B) and (C), comprising 56 students (28 in each section). The 8 students from the exploratory sample were excluded, leaving 48 students, representing 57.142 per cent of the original research population. They were divided into two groups—an experimental group and a control group—with 24 students in each group. The experimental group, comprising Section A, utilised skill-based exercises based on Driver's model, whilst the control group, comprising Section (B), used the traditional method followed in the curriculum by the school's physical education teacher.

Tests and measurements:

The researcher identified the core handball skills used in the study; these were defined in accordance with the curriculum adopted by the Ministry of Education (the curriculum) in Iraq. These skills are (handling, dribbling, scoring) in handball. The researcher then reviewed the scientific sources and references related to the research topic to identify the tests specific to the skills under investigation; these were subsequently presented to a panel of experts to select the most appropriate test for each of the skills under investigation. The following tests were agreed upon: for the handling skill (the passing distance and accuracy test) (Diaa Al-Khayyat and Nofal Mohammed Al-Hayali, 2001, 500), for the dribbling skill (the 15-metre straight-line dribbling test) (Diaa Al-Khayyat and Nofal Mohammed Al-Hayali, 2001, 506), and for the shooting skill (accuracy test on the goal from a distance of 6 m) (Diaa Al-Khayyat and Nofal Mohammed Al-Hayali, 2001, 507). These tests have previously been applied to samples similar to the current research sample and are therefore considered appropriate for this study. Furthermore, face validity was established through expert consensus. The researcher also utilised the Constructive Thinking Scale developed by Meier & Epstein (1989) which consists of 108 items measuring six dimensions and contains five response options. To ensure the validity and suitability of the scale for the current research sample, the researcher established the scientific basis of the scale; face validity was established, with all experts to whom it was presented agreeing at a rate of 100 per cent for all items. Thus, face validity was established. Subsequently, discriminant validity and internal consistency were assessed for the scale items, and all items were found to be valid. Stability was then assessed using the split-half method, yielding a value of (0.748), which is considered half the reliability coefficient. This was then processed using the Spearman-Brown method to determine the full reliability coefficient, yielding a value of (0.856), which is a high reliability coefficient. Reliability was also assessed using another method, the Cronbach's alpha, in which the scale achieved a value of (0.892), which is a high reliability coefficient; the scale is therefore suitable for the research sample.

The teaching plan based on Driver's model of constructive thinking:

In order to develop lesson plans in a scientific manner, the researcher conducted face-to-face interviews with a number of experts specialising in teaching methods and also reviewed numerous scientific sources and references relating to the subject of the study, namely Driver's model. The researcher then prepared a special questionnaire to assess the validity of the lesson plan, which included skill-based exercises in accordance with Driver's model, in order to demonstrate its impact on constructive thinking and the acquisition of a number of basic handball skills, with a view to applying it to students in the experimental group. The researcher distributed the questionnaire to the experts to elicit their opinions and observations regarding the teaching plan and to finalise its form. The experts' agreement rate (100 per cent) on the proposed teaching plan.

Procedures:

The researcher, together with the support team, prepared all the requirements for the tests and the main experiment. An introductory session was conducted for the students on the skill-based exercises included in the teaching plan and the objectives they sought to achieve. The

researcher then administered the pre-tests to both the experimental and control groups on Sunday, 19 February 2023, at the Amr ibn Jundub al-Ghafari Preparatory School for Boys, affiliated with the Tikrit Education Department. The tests administered included the Constructive Thinking Scale and the basic handball skills tests under investigation. Through this procedure, the researcher collected the data and recorded it on a data collection form in order to carry out statistical analyses.

The researcher then reviewed scientific sources and references and interviewed specialists in the field of teaching methods to seek their views on the preparation of lesson plans and skill-based exercises for the teaching units, in accordance with Driver's model, and their application to students in the experimental group. A total of 12 teaching units were prepared, with the total duration of the teaching units 480 minutes. These were taught by the school's physical education teacher, with the first teaching unit commencing on Monday 27 February 2023 and concluding on Wednesday 5 April 2023, at a rate of two teaching units per week, held on Mondays and Wednesdays each week. As for the control group, they were taught the same skills under investigation but using the traditional method employed by the school's physical education teacher, with the same number of teaching units, duration and days as those undergone by the experimental group.

The lesson plans, which included skill-based exercises based on the Driver model, were implemented with the experimental group under the researcher's supervision, in accordance with the sections of the lesson plan, which included the following:

Explaining to the pupils the importance of skill-based exercises and their objectives. The researcher's work focused on the main section of the teaching unit, which lasted 28 minutes. During this unit, the researcher guided the students by presenting models and teaching aids for skilful performance and suggesting ideas on how to carry them out correctly, after which the students were divided into groups of eight, with one student acting as group leader. They discussed ideas regarding the practical application of the lesson topic amongst themselves. Once each group had generated a number of ideas, these were collected by the subject teacher to be reformulated and corrected in the most appropriate and comprehensible manner for the students. The students then practise the skill associated with the lesson topic in accordance with the ideas raised and discussed during the lesson, concluding with a review of the changes in their understanding: this involves comparing their current performance with the ideas previously discussed in the lesson, identifying areas for improvement, and demonstrating the correct way to perform the skill.

Following the completion of the teaching plans for the skills exercises based on the Driver model, which were implemented with the experimental group, as well as the teacher's usual approach with the control group, the researcher conducted the post-tests on Thursday, 10 April 2023, under the supervision of the researcher and with the assistance of the support team. The post-tests were conducted in exactly the same manner as the pre-tests in terms of location and procedures followed.

To analyse the data obtained, the researcher utilised a number of statistical methods via the statistical software (SPSS). These methods included percentages, the arithmetic mean, standard deviation, Pearson's simple correlation coefficient, Spearman-Brown's correlation coefficient and Cronbach's alpha. The researcher also used the t-test for paired and independent samples to identify differences between the pre-tests and post-tests, as well as between the two post-tests.

RESEARCH RESULTS

Through these methods, the researcher arrived at the following results:

Table 1. Shows the arithmetic means and standard deviations for the experimental and control groups using Driver's model in the pre- and post-tests for the skills under investigation and the Constructive Thinking Scale

No	Group	Variables	Unit of measurement	Pre-test		Post-test		Value (t)	Significance level (sig)
				S	A	S	A		
1	Experimental	Long-handled	Number	8,000	1,485	13,100	3,427	11,316	0,000
		Al-Tabtaba	Second	12,600	1,984	8,850	1,348	7,394	0,000
		Correction	Score	12,763	2,032	19,707	3,872	9,827	0,000
		Constructive thinking	Score	349,800	17,237	407,847	17,919	7,737	0,000
2	Officer	Long-handled	Number	7,500	1,389	9,666	1,728	23,084	0,000
		Al-Tabtaba	Second	13,300	1,688	10,850	1,460	8,876	0,000
		Correction	Score	12,428	3,263	16,245	3,387	6,154	0,000
		Constructive thinking	Score	343,500	13,188	372,750	17,919	5,344	0,000

(*) Significant if the significance level is < (0.05).

Table 2. Shows the results of the differences between the arithmetic means, standard deviations and the calculated t-value, as well as the level of statistical significance between the results of the skills tests under investigation and the Constructive Thinking Scale

No	Variables	Unit of measurement	Experimental group		Control group		Value (t)	Significance level (sig)
			S	A	S	A		
1	Long handle	Number	13,100	3,427	9,666	1,728	4,899	0,000
2	Al-Tabtaba	Second	8,850	1,348	10,850	1,460	4,499	0,000
	Correction	Score	17,728	2,728	14,366	2,378	13,527	0,000
3	Constructive thinking	Score	407,847	17,919	372,750	17,919	6,928	0,000

(*) Significant if the significance level is < (0.05).

DISCUSSION

The tables above show that there are statistically significant differences between the pre- and post-tests for both the experimental and control groups, with the post-test scores being higher in all tests for both groups.

The researcher attributes these differences to the positive impact of the skill-based exercises used in the lesson plans, based on Driver's model, which led to the development of students' constructive thinking and the acquisition of a number of fundamental handball skills. These exercises proved highly effective in raising students' level of constructive thinking, as well as improving their performance in the fundamental in handball under investigation by the students. The skill-based exercises included in the teaching units proposed by the researcher were designed in accordance with scientific principles and foundations; the lesson plans were implemented in a practical manner that increased student interaction and collaboration towards arriving at correct ideas and understanding how to perform correctly. This was achieved through a gradual progression in learning and understanding, beginning before practical application, followed by a discussion and correction of the ideas proposed by the students. Students then began to perform the task, comparing their current performance with their previous ideas and correcting them. This enabled students to gain a correct understanding, recognise the mistakes to be avoided, and derive the correct approach to performance, applying it skilfully so that they could perform the basic skills efficiently and with correct movement. All this is thanks to the nature of the Driver model, which fosters a spirit of cooperation amongst students, whilst also enhancing their ability to think critically, identify and correct errors, and demonstrate the interrelationships between their ideas and their skilful performance. As (Abdul-Rahim, 2000) points out that the Driver model relies on 'presenting concepts in such a way as to create obstacles that hinder the learner's understanding, whilst encouraging them to draw on ideas from the group through activities and a step-by-step approach; this serves to reframe ideas about the skill and correct errors' (Abdul-Rahim, 2000, 89)

Providing information specific to the skill and carrying out exercises ranging from easy to difficult, based on consistent repetition and preparation throughout the sequential units which provided an understanding of the skill had a positive impact. This approach was structured to progress from easy to difficult and included sequential exercises tailored to the students' level and the required skill; it was further reinforced by supplementary teaching aids such as posters and images, which also provided comprehensive explanations of the skill, thereby enhancing the students' ability to retain information. The Driver model aided the acquisition, consolidation and retrieval of information when required. Furthermore, dividing the students into collaborative groups, presenting information to them and preparing their minds helped them learn more quickly, as the units designed in this way according to the Driver model motivated the learners and stimulated their interest in the skill, followed by coordinated steps within the model, since "a structured learning framework helps students adjust and correct their misconceptions, provided that there is alignment between the student's prior knowledge and the experiences they have recently acquired in the lesson." (Zaytoun, 2020, 66)

Indeed, the progress observed in students' levels is attributable to the use of Driver's model, which helps learners to see the relationships between things rather than the things themselves. This enhances their deep understanding of concepts and also facilitates meaningful learning by enabling them to clearly recognise the nature and role of concepts and the relationships between them, allowing them to perceive the characteristics of the parts as a whole, as well as increasing their ability to tolerate ambiguity and uncertainty and to benefit from changes in their thinking

This was confirmed by Antony (1985), who stated that all learners must be engaged in the training by stimulating their motivation, whilst ensuring the method is applied objectively (Antony, 1985, 124). The researcher believes that the differences observed among members of the experimental group and the improvement in their level were due to the students' commitment to attendance and their adherence to the subject teacher's instructions and guidance at school during the teaching units; furthermore, the lesson plans included skill-based exercises that helped to foster motivation and excitement, thereby increasing the desire to learn and think through collaboration amongst students in groups formed within the teaching units, and by refining ideas before putting them into practice. All of this helped to enhance their capacity for constructive thinking, as well as to perform the basic skills of handball more effectively and with less time and effort.

As for the improvement in the control group's results and the rise in their performance levels, the researcher attributes this to the students' commitment to the lessons and their adherence to the teacher's instructions, as well as to the repetition of the skills during the lesson and the teacher's explanation and demonstration of the skills through a live model. These factors led to an improvement in their performance levels in the skills under study, as well as the students' motivation to learn and follow the teacher's instructions for acquiring the skills, and to engage in more constructive reflection on their performance of the skills; all of this helped them to learn and improve their performance levels.

The results indicated that there were differences between the experimental and control groups in the post-tests, in favour of the experimental group. The researcher attributes this improvement to the use of the Driver model, which helped to generate new ideas and encouraged students to collaborate in proposing and discussing ideas, reaching solutions, and refining previous ideas whilst applying the skills and comparing them with their prior ideas and concepts. The researcher also attributes this difference in favour of the experimental group to the methods used, explanatory and illustrative methods, utilising visual aids to demonstrate performance, whilst posing questions, presenting ideas and discussing information whilst correcting it. This increased the students' motivation to learn as a result of their sense of importance in the lesson through their participation in thinking, refining ideas and applying them in a practical manner.

CONCLUSIONS AND RECOMMENDATIONS

The study concluded that skills-based exercises based on the Driver model have a positive and effective impact on the development of constructive thinking and the acquisition of a number of fundamental handball skills. The model proved highly effective, motivating students to learn more quickly than with traditional teaching methods; it also helped to increase students' enthusiasm for learning and reduced the likelihood of and their tendency to disengage from lessons, thanks to their collaboration with one another and their ability to propose and refine ideas, and whilst the control group showed improvement, this was to a lesser extent than that of the experimental group. This demonstrates the effectiveness of the Driver model and the skill-based exercises used in enhancing constructive thinking and the acquisition of a number of basic handball skills; We therefore note that the proposed teaching plans incorporating skill-based exercises based on the Driver model were instrumental in developing the level of the experimental group as a result of their positive and influential interaction in the learning process, which demonstrated a clear superiority over the traditional methods used with the control group.

In this context, the researcher recommends the adoption of the Driver model in the teaching process for learning basic handball skills and developing constructive thinking among students, given its proven positive impact on integrating students into processes of inquiry and reflection, and on refining the formulation of ideas through their application and correction by comparing the concept with actual performance, as well as the effective role of teaching units designed in accordance with this model in improving the level of skill performance and constructive thinking compared to the method currently in use.

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