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The Impact of Using Certain Multimedia Resources on Handball Students' Legal Knowledge

Husam Abed Muhi
College of Physical Education and Sports Sciences, University of Tikrit, Iraq
h.m.sport@tu.edu.iq

Corespondensi Author
Email: h.m.sport@tu.edu.iq

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ABSTRACT
The aim of this study is to develop teaching plans utilising multimedia to teach handball law to students, and to investigate the impact of the proposed teaching plans using multimedia on students' legal knowledge of handball. The researcher employed an experimental approach using a three-group design—two experimental groups and one control group—with pre- and post-tests, as this was deemed appropriate for the research problem and objectives.The research population consisted of fourth-year morning-session students at the Faculty of Physical Education and Sports Sciences, University of Tikrit, for the 2022/2023 academic year, totalling 84 students distributed across three sections (B, C and D). The research sample was defined as comprising these three sections, and nine students were excluded from the exploratory sample, leaving 75 students representing 89.285 per cent of the original research population. They were divided into three groups—two experimental and one control group—with 25 students in each group. After conducting pre-tests, implementing the teaching plans, carrying out post-tests and collecting the data, the researcher analysed the data statistically using SPSS. The study concluded that multimedia has a positive impact on legal knowledge of handball; it proved highly effective, particularly the use of (videos), which motivated students to learn more quickly than other methods. Multimedia contributed to increased student engagement in lessons through their active participation and the formation of comprehensive mental images of the information received from the teacher, We therefore note that the proposed teaching plans utilising multimedia (videos) were what contributed to the development of the first experimental group, owing to their positive and influential impact on learning, to a greater extent than the contribution of multimedia (digital images) or the traditional methods employed

Keywords: Multimedia; Videos; Digital images; Legal knowledge; Handball

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INTRODUCTION

Handball is a highly popular team sport that has developed significantly in recent times, with a variety of playing styles being employed. Given the fast pace of the game, it requires the application of modern approaches, whether in the selection of players, the teaching of technical skills, or the organisation of team strategies to face opponents (Avramova, 2021; Musa & Menezes, 2023; Ríos et al., 2022; Sahli et al., 2024). Alongside this development, there have also been updates to the International Handball Laws Players must possess a comprehensive understanding of the rules to avoid committing fouls on the court and to execute their skills and tactics in accordance with what is permitted by the rules. Teaching students the rules of the game is no easy task; rather, it requires the use of modern strategies and methods to help them learn the legal aspects and understand what is permitted and prohibited under the rules (Guimarães et al., 2026; Masada & Nakano, 2013).

A number of previous studies have shown that the use of multimedia, especially video and digital images, can increase the effectiveness of learning compared to traditional teaching methods that rely more on verbal explanations and direct demonstrations (Ljubojevic et al., n.d.; Zhang, 2026). Video media provides students with the opportunity to observe a movement, game situation, or the application of rules repeatedly through visual and audio representations, thus helping to clarify complex information. Meanwhile, digital images can present information in a simpler and more focused way through illustrations, diagrams, or visualization of game situations (Nurharini et al., 2019; Zhang & Shang, 2016). Several studies in physical education and

sports learning have also shown that the use of video and visual media can improve students' understanding,attention, motivation and ability to remember and apply material compared to conventional learning. However, the effectiveness of each form of multimedia can differ depending on the characteristics of the material and the learning objectives to be achieved (Adams et al., 2025; Priyambada et al., 2024).

Previous research has also shown that traditional methods still have limitations, especially when the material taught is related to concepts, situations, and game rules that require visual understanding. In learning handball rules, for example, verbal explanations alone can cause students to have difficulty imagining foul situations, player positions, game procedures, and the application of rules in dynamic match conditions.

Video has the advantage of presenting a complete and contextual game situation, while digital images allow the presentation of certain examples in a simple, directed, and easy-to-observe manner. However, most previous studies have examined the use of multimedia to improve technical skills, motivation, or general learning outcomes, while studies that specifically compare the use of visual media in learning knowledge and understanding of the rules of the game of handball are still relatively limited.

Based on these conditions, this research places itself in a different space from previous research, namely by focusing the use of multimedia on the development of legal knowledge or students' understanding of the rules of the game of handball. The uniqueness of this research lies in the effort to utilize the form of multimedia as a means to visualize aspects of the rules that are difficult to understand only through conventional explanations, so that students not only know the rules theoretically but are also able to form a mental picture of their application in game situations.

The success of teaching methods and approaches depends on the teacher, the student and the curriculum; the teacher cannot carry out their work without a curriculum to teach the student, and the curriculum is meaningless without the teacher and the student. Similarly, the student is an integral part of the learning process; none of these elements can function without the others. The teacher must use resources that help them convey theto the students in a seamless manner. One of the modern methods used in teaching is multimedia, which has proven successful in many lessons; it represents a modern approach to student education, as it facilitates the mental visualisation of information through what is presented to the student whilst the topic is being explained, whether the media consists of videos, images, drawings, or even live models or. Consequently, recent developments in teaching methods have incorporated multimedia as a means of educating students, in order to keep pace with advancements and accelerate the learning process as much as possible, so as to achieve the objectives in line with current requirements.

Thus, the importance of using multimedia lies in the fact that it helps students to learn effectively; it simplifies the path to knowledge and makes it easier to understand, enabling them to form a clear and comprehensive mental picture of the information they receive from their teacher. This makes it easier for them to apply what they have learnt and reduces errors in their performance, thereby boosting students' self-confidence and stimulating theirtheir motivation to learn even further.

The researcher therefore decided to utilise certain forms of multimedia to investigate their impact on students' legal knowledge of handball, as part of a serious endeavour to use multimedia to enable learners to learn more quickly by stimulating their

motivation and illustrating concepts visually , Hence, the significance of this study lies in the development of teaching plans utilising multimedia to assess their impact on students' legal knowledge of handball.

METHODS

Participants:

The research population consisted of fourth-year morning-session students at the Faculty of Physical Education and Sports Sciences, University of Tikrit, for the 2022/2023 academic year, totalling 84 students distributed across three sections (B, C and D). The research sample was defined as comprising these three sections; nine students were excluded from the exploratory sample, leaving 75 students representing (89.285 per cent) of the original research population. They were divided into three groups—two experimental and one control group with 25 students in each group. The first experimental group, comprising Section (B), utilised multimedia (videos) to teach legal knowledge, whilst the second experimental group, comprising Section (C), utilised multimedia (digital images) to teach legal knowledge; the control group, comprising Section (B), utilised the traditional method of teaching legal knowledge as followed in the curriculum by the handball lecturer at the college.

Tests and assessments:

In order to arrive at the research findings, the researcher utilised the legal knowledge scale developed by (Ramiz, 2021) (Appendix 1), which consists of 33 items and is based on the vocabulary of the handball curriculum for fourth-year students, It contains answer options, with responses classified as either correct or incorrect; a correct answer is awarded one mark and an incorrect answer zero marks. Consequently, the highest possible score is 33 and the lowest is (zero). To ensure the validity of the scale, the researcher carried out the scientific validation procedures for the scale, verifying its face validity through the experts' agreement rate regarding the suitability of the current research sample, which reached 100 per cent for all items as assessed by the experts to whom the scale was presented. The researcher then determined the discriminant validity (the two extreme groups) and the internal consistency of the scale items; all items were found to be valid. The researcher then assessed reliability using two methods: the first was the split-half method, which yielded a split-half reliability coefficient of (0.921). This was adjusted to calculate the full reliability using the Spearman–Brown formula, yielding a value of (0.959), which is a high reliability coefficient. The second method for assessing reliability was the Cronbach's alpha method, in which the scale achieved (0.964), which is also a high reliability coefficient. The scale is therefore suitable for the research sample.

The teaching plan utilising multimedia:

In order to develop a lesson plan incorporating the use of multimedia, the researcher consulted scientific sources and references and conducted face-to-face interviews with experts specialising in teaching methods, with a view to devising a lesson plan suited to the research sample. The researcher prepared two lesson plans: one utilising multimedia (videos) and the other utilising multimedia (digital images) Both plans were set out in a special questionnaire to assess the suitability of the teaching plan utilising multimedia, with a view to determining its impact on students' legal knowledge of handball. The plan was then implemented with students in the first and second

experimental groups. The researcher distributed the questionnaire to the experts to gather their opinions and observations on the plan and to finalise theteaching plan in its final form; the experts agreed unanimously (100 per cent) on the proposed teaching plan. Procedures:

The researcher, with the assistance of the support team, prepared all the necessary materials for the main experiment as well as the requirements for conducting the tests. He delivered an introductory session to the students on the components of the teaching plan and its objectives, The researcher then conducted the pre-test on the research groups on Monday, 20 February 2023, in the lecture theatres of the Faculty of Physical Education and Sports Sciences at the University of Tikrit. The test used was the Handball Legal Knowledge Scale, and 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 drew on the opinions of specialists in the field of teaching methodologies in order to prepare lesson plans and teaching units using multimedia to teach the technical aspects of handball and apply them to the two experimental groups in order to achieve the research objectives, The lesson plans comprised eight teaching units, with a total duration of 720 minutes. These were delivered by a handball lecturer to fourth-year students at the college. The teaching units for students in both experimental groups commenced on Monday 27 February 2023 until Thursday 23 March 2023, at a rate of two teaching units per week, held on Mondays and Thursdays each week. As for the control group, they were taught the legal aspects of handball using the traditional method employed by the handball lecturer for fourth-year students at the college, with the same number of sessions, duration and days as those undergone by the two experimental groups.

The teaching plans were implemented for the two experimental groups using multimedia and under the supervision of the researcher, in accordance with the sections of the teaching plan, which included the following:

During the teaching process, the lecturer explained the legal provisions using multimedia, with each teaching unit lasting 60 minutes.

Multimedia (videos) were used with the first pilot group, as the legal material was explained in detail, accompanied by videos illustrating each legal provision – ranging from pitch dimensions to refereeing decisions in international matches and how decisions are made during play. Students were given the opportunity to apply refereeing scenarios through practical play situations, and were divided into two teams to play a match, with the focus on committing offences during play so that the student (referee) can apply the legal procedure for such offences, whilst ensuring that all students pay attention to what has happened and what the correct procedure is.

As for the second experimental group, multimedia (digital images) was used, whereby the legal material was explained in detail whilst displaying digital images illustrating each legal provision, in accordance with the lesson plan used with the first experimental group.

Upon completion of the lesson plans utilising multimedia with the two experimental groups, as well as the curriculum followed for teaching the subject to the control group, the researcher conducted the post-tests on Monday, 27 March 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.

A number of statistical methods were used to analyse the data obtained by the researcher using the statistical software SPSS. These methods included percentages, the arithmetic mean, standard deviation, Pearson's simple correlation coefficient, Spearman–Brown's correlation coefficient, Cronbach's alpha, the F-test to identify differences, and the LSD test to identify the smallest significant difference. Furthermore, the researcher used the t-test for paired samples to identify differences between the pre- 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 two experimental groups and the control group using multimedia in the pre- and post-tests of the legal knowledge scale

Table	Group	Unit of measurement	Pre-tests	'	Post-tests	'	Value (t)	Significance level (sig)
1	First experimental	Grade	15.280	2.051	28.520	5.416	10,541	0,000
2	Second pilot	Grade	15.120	2.027	22.520	3.787	8,526	0,000
3	Female officer	Grade	15,160	2,339	21.960	4,429	8,370	0,000

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

Based on Table 1, there was an increase in the value of legal knowledge in the three groups after being given learning using multimedia. In the first experimental group, the average score increased from 15,280 in the pre-test to 28,520 in the post-test, with a t-value of 10,541 and a significance of 0.000. The second experimental group also experienced an increase, from an average of 15,120 to 22,520, with a t-value of 8,526 and a significance of 0.000. Meanwhile, the third group increased from 15,160 to 21,960, with a t-value of 8,370 and a significance of 0.000.

Table 2. Means, standard deviations, 'f' values and significance levels (sig) for the dimensional tests of the three research groups

No.	Variables	Pearson correlation coefficient value	Sig. level	Sig. type
1	Mental Skills X Academic Compatibility	0.87	0.000	Sig.
2	Mental skills X Self-skill	0.74	0.001	Sig.
3	Academic compatibility X Self-skill	0.82	0.001	Sig.
4	Partial correlation coefficient values	0.67	0.001	Sig.

Table 2 shows that the sig value was 0.000 and this value indicates that there are statistically significant differences between the three groups in the post-hoc tests;

however, the analysis of variance (ANOVA) does not show a difference in favour of any one of the three groups. In order to identify the difference in favour of any group, the researcher used the Least Significant Difference (LSD) test (LSD) to compare the arithmetic means of the variables in their post-hoc tests; Table (3) illustrates this.

Table 3. Shows the LSD test for the least significant difference between the three research groups in the variables under investigation

Skill	Groups	Difference in mean values	Significance results	Significance (sig)	Statistical significance in favour of
Roll	Mean 1 – Mean 2	28.520 – 22.520	6.000	0.000	First experimental group
	Group T1 – Group Z	28,520 – 21,960	6,560	0.000	First experimental group
	Group 2 – Group D	22.520 – 21.960	0560.	0.668	Not significant

Based on Table 3, the LSD test results showed a significant difference between the first experimental group and the second experimental group. The difference in the mean value of the two groups was 6,000 with a significance value of 0.000, so the difference was in favor of the first experimental group. Significant differences were also seen between the first experimental group and the third group, with an average difference of 6.560 and a significance value of 0.000. Meanwhile, the comparison between the second and third experimental groups showed a relatively small average difference, namely 0.560, with a significance value of 0.668, so the difference was declared insignificant.

DISCUSSION

The results in the tables above show that there are significant differences between the pre-test and post-test scores for both groups, with the post-test scores being higher across all categories. The researcher attributes this significant difference to the use of teaching plans incorporating multimedia in the delivery of the handball curriculum, which includes the rules of handball. These teaching plans have demonstrated a significant impact and positive effectiveness in enhancing students' learning and increasing their knowledge of the rules of handball, as the teaching units prepared by the researcher were designed in accordance withscientific methods, drawing on reliable academic sources and references relevant to the research topic. Consequently, they had a significant impact on the development of students' knowledge and the emergence of a statistically significant difference between the pre- and post-tests.

The lesson plans were implemented using a progressive approach to learning through a sequence of instructional material, as well as by applying what the students had learnt through small-scale game scenarios and refereeing scenarios, culminating in handball matches between students, with the students themselves acting as referees. Consequently, the lesson plans were based on a scientific approach whilst stimulating students' motivation to learn by introducing an element of excitement during the

teaching units to prevent boredom. This enhanced their learning process due to the integration of thewith the practical aspect, which increased their legal knowledge and improved their standard. Al-Khouli and Al-Shafei (2000) note that 'handball is one of the sports in which the success of players' performance is linked to theoretical and practical foundations, as providing the athlete with information and knowledge specific to the game, which they then integrate with what they have learnt previously, leads to creative thinking that is reflected in their performance on the court; all of this requires the combination of mental and motor work in order to form an appropriate response to various situations.

The progress made by the first experimental group and its superior performance compared to the second experimental and control groups demonstrates the effectiveness of the methodology used and the impact of multimedia (videos), which helped students increase their legal knowledge of handball rules; watching refereeing situations on video creates a clear mental picture of correct decisions and the proper application of the rules on the court, as video simulates reality better than digital images or the traditional teaching methods used at the college. Video helps to foster a broad understanding of correct behaviour and allows situations to be realistically re-enacted in class. Through collaboration with peers, students consolidate their knowledge in two ways: firstly, as a referee making a decision, and secondly, as a player who has committed an offence and is subject to a legal sanction. This collaboration, in which students undertake their assigned tasks with enthusiasm and passion, has made them more engaged in lessons and better ableto perform more dynamically. Saad & Haider (2020) note that "the multimedia approach is one form of modern educational technology; it is regarded as an educational system that interacts functionally through the learning process to achieve specific objectives. This approach is based on a well-structured, sequential organisation that allows each student to progress through the learning process according to their individual characteristics and to remain active and positive throughout" (Saad & Haider, 2020, 29).

Videos had a greater impact than digital images, as members of the first experimental group showed greater development than those in the second experimental group, which used multimedia (digital images), because watching a performance attracts more attention than other methods; it serves to stimulate greater motivation to learn and foster a positive desire to learn and improve. As Albusac et al. Al. 2024) highlight the importance of video, noting that 'students' viewing of correct performance via video captured their attention and interest, and motivated them to make an effort to correct mistakes and improve their performance, and that video is considered one of the key factors in capturing students' attention, arousing their interest and curiosity; it also helps to foster desired behaviours and increases students' receptiveness to learning, thereby encouraging them to participate actively in the work and improve their performance" (Albusac, et al. 2024).

CONCLUSIONS AND RECOMMENDATIONS

The study concluded that multimedia has a positive impact on legal knowledge of handball; it proved highly effective, particularly the use of videos, which motivated students to learn more quickly than with traditional methods or multimedia using digital images for learning. Multimedia contributed to increased student engagement in lessons

through their active participation and the formation of comprehensive mental images of the information received from the teacher, and that both the second experimental group and the control group also improved their level of legal knowledge, but did not reach the level of improvement achieved by the students in the first experimental group; this indicates that multimedia (videos) is more effective in enhancing legal knowledge of handball, We therefore note that the proposed lesson plans utilising multimedia (videos) were what contributed to the development of the first experimental group, owing to their positive and significant impact on learning, which was greater than that of multimedia (digital images) or the traditional methods employed.

The researcher recommends that it is essential to use multimedia (videos) in handball law lessons, given their effectiveness in increasing legal knowledge, developing students' learning abilities, improving their understanding of correct performance, and enabling them to apply this knowledge correctly from the outset with as few errors as possible.

REFERENCES

Adams, A., Goad, T., Jenkins, A., & Belcher, D. (2025). Powering Up Online Physical Education: Unleashing the Potential of Video. Strategies, 38(2), 13–20. https://doi.org/10.1080/08924562.2024.2444205.

Al-Khouli, Amin Anwar and Al-Shafei, Jamal al-Din Abdul-Ati. (2000): The Contemporary Physical Education Curriculum: Dar al-Fikr al-Arabi for Printing and Publishing. Cairo.

Albusac, J., Herrera, V., Dominguez-Ocaña, O., Angulo, E., Reyes-Guzmán, A. de los, & Vallejo, D. (2024). A Virtual Reality-Based Adapted Handball Serious Game for Upper Limb Rehabilitation in Patients with Spinal Cord Injuries. International Conference on Enterprise Information Systems, ICEIS – Proceedings, 2, 337–347. https://doi.org/10.5220/0012554600003690.

Avramova, M. (2021). Correlation structural models of physical development, physical and technical fitness of adolescent handball players. Series on Biomechanics, 35(2), 30–33. https://www.scopus.com/pages/publications/85110743275?origin=resultslist

Guimarães, F. J. de S. P., Da Silva, L. S., & Leão, I. C. S. (2026). Structural and dynamic analysis of the collective attack in high-level handball: a systematic review. Revista Andaluza de Medicina Del Deporte, 19(1), 22–27. https://doi.org/10.33155/ramd.v19i1.1229.

Ljubojevic, M., Vaskovic, V., Stankovic, S., & Vaskovic, J. (n.d.). Using Supplementary Video in Multimedia Instruction as a Teaching Tool to Increase Efficiency of Learning and Quality of Experience.

Masada, Y., & Nakano, M. (2013). Bioengineering approach to the tactics of generation in handball games. ICIC Express Letters, 7(7), 2197–2202. https://www.scopus.com/pages/publications/84877744246?origin=resultslist.

Musa, V. S., & Menezes, R. P. (2023). The teaching of offensive skills against different defensive scenarios in handball: analysis of coaches' perspectives in different categories. Anais Da Academia Brasileira de Ciencias, 95. https://doi.org/10.1590/0001-3765202320220998.

Nurharini, A., Sumilah, & Yuyarti. (2019). Animated Video Media: Motoric Skills In Dance Lesson. 2019 5th International Conference on Education and Technology (ICET), 102–107. https://doi.org/10.1109/ICET48172.2019.8987223.

Priyambada, G., Suprayitno, S., Ndayinsenga, J., Ristiana, P. A., Sunarti, S., Pebrian, A., & Budiman, B. (2024). Video Variations As Learning Method Of Physical Education. Journal of Physical Education (Maringa), 35(1). https://doi.org/10.4025/jphyseduc.v35i1.3551.

Ramiz, Wissam Hadi. (2021): The Impact of an E-Learning Programme Based on Blended Learning on Cognitive Achievement, Decision-Making on the Court, and the Performance of Certain Basic Handball Skills: Unpublished doctoral thesis. Faculty of Physical Education and Sports Sciences. University of Babylon.

Ríos, C., Antúnez, A., Feu, S., Gómez-López, M., Petrariu, I., & Leuciuc, F. V. (2022). Selection Process for Romanian Children in Handball Based on Coordinative Abilities: A Questionnaire Survey. https://doi.org/10.3390/ijerph.

Saad, K. N., & Haider, O. Z. (2020). An analytical study of the levels of psychological differentiation among premium-class handball players. Journal of Studies and Researches of Sport Education, (62).

Sahli, F., Bouzouraa, M. M., Rebhi, M., Romdhani, A., Sahli, H., Salem, A., Trabelsi, K., Ammar, A., & Zghibi, M. (2024). Enhancing Skills, Mood, and Performance in Overweight Handball Players: Exploring Individual vs. Collective Verbal Encouragement Strategies. Children, 11(4). https://doi.org/10.3390/children11040432.

Zhang, L. (2026). Development and application effect of multimedia teaching resources for children's literature supported by software. Australian Journal of Electrical and Electronics Engineering, 1–14. https://doi.org/10.1080/1448837X.2025.2611672

Zhang, L., & Shang, J. (2016). Understanding the Educational Values of Video Games from the Perspective of Situated Learning Theory and Game Theory. 2016 International Conference on Educational Innovation through Technology (EITT), 76–80. https://doi.org/10.1109/EITT.2016.22.