

EFFECTS OF THE SPECTRUM AND TEACHING GAME FOR UNDERSTANDING (TGFU) APPROACHES ON HANDBALL SKILLS AMONG IRAQI SCHOOL STUDENTS

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ABSTRACT

The ongoing underrepresentation of Iraqi school students in science, mathematics, and PE (physical education) (SMPE) in general, and especially in PE demonstrates the need to develop and implement strategic high impact practice, such as new effective teaching strategies that not only improve students' academic outcomes but also foster student development holistically. In Iraqi schools, there is a need to help students persist and remain interested in their discipline and academic level; hence, this study aims to explore the effects of various PE STA (spectrum teaching approaches), the TGFU (teaching game for understanding), and TTA (traditional teaching approach) on intermediate school students' HBS (basic handball skills). A total of 90 male students participated in the present study. In EGs (experimental groups), the STA and TGFU were employed for EG1 (experimental group one) and EG2 (experimental group two), while the TTA was used for CG (control group). The results of the SPANOVA test showed a significant effect of the STA and TGFU approaches in enhancing the BHS in favour of the STA. However, there were no statistically significant differences in the interaction between Test time and teaching groups. The value of research does not require only coming up with solutions to a problem (under study) but also revealing new concerns worthy of investigation and analysis, such as investigating this tool's effectiveness in teaching other sports.

Keywords: *Physical Education, Handball Skills, Spectrum, TGFU, Traditional*

INTRODUCTION

PE is a mandatory subject in Iraqi elementary and intermediate schools. PE aims to enhance students' cognitive, psychomotor, and affective abilities (Mastrogiannis et al., 2017). PE teachers must focus on teaching and learning to foster student knowledge, learning, and enjoyment (Bywater, 2020). However, the lack of student engagement may challenge the development of physical abilities, movement skills, and health knowledge. The PE curriculum includes games and sports, comprising 65% of the content (Raúl A Barba-Martín et al., 2020). Students must acquire fundamental skills in these areas. Therefore, PE teachers should understand their students' characteristics and create effective learning techniques (Kristina et al., 2021).

The instructional approach and tactics are crucial to improve student participation and encourage participation in class activities (Kiat et al., 2015). Traditional teaching approaches have emphasised specific skills, and highly planned courses (Metzler, 2017), but there is a call for reforming PE methodology (Haugen et al., 2021). The teaching technique in PE should be motivating, fun, and employ appropriate instructional and pedagogical approaches. Effective instruction in games and sports is essential to meet student needs and increase their involvement and satisfaction in PE classes (Ab-Rahman et al., 2020).

In Iraq's physical education classes, there is a lack of understanding and use of terminology related to teaching strategies. The term "strategy" is primarily associated with learning rather than teaching, probably because of teachers' lack of knowledge. As a result, the term "traditional method" is commonly used interchangeably for both traditional method and traditional approach in PE education in Iraq (Al-Mamoori-Riyadh, 2016).

The traditional approach also known as the reproductive or teacher-centred method, involve teachers taking the lead in decision-making during lessons. Research in Iraq have shown that students' learning outcomes in PE classes have suffered due to a lack of sufficient time and opportunities for active participation in physical activities (Ahmed, 2010).

The teaching approach in education is vital for effective learning and should align with students' preferences. Various educational models and learning approaches have been proposed and can practise as a guide for teachers (Kamaruddin & Mohamad, 2011). The choice of teaching strategies is crucial for the efficiency and success of the learning process. Strategy is defined as "a plan for achieving predefined objectives" (Kristina et al., 2021). Among the teaching approaches mentioned, the Mosston teaching approach is commonly used in PE education. It consists of 11 different teaching approaches, including command, practice, reciprocal, self-check, inclusion, guided discovery, convergent discovery, divergent discovery, learner designed, learner initiated, and self-teaching (Yani & Henjilito, 2020).

The spectrum of practice approach B involves individual or group practice of a memory/reproductive task with feedback (Mosston & Ashworth, 2008). In this approach, the teacher takes on the responsibility of making decisions regarding the subject matter and logistics, as well as providing feedback to the learners. The learners' role is to independently practice or practise in groups the memory/reproduction task. This approach can be accurately referred to as the independent or group practice approach, focusing on the distribution of decision-making that determines the learning objectives.

The Teaching Exercises approach (practice approach) offer various benefits that make it an effective models for lessons. Firstly, it allows the teacher to instruct a large number of students simultaneously. Secondly, students develop the ability to work independently. Thirdly, they learn to make decisions based on existing guidelines. Fourthly, students become familiar with time constraints. Fifthly, they understand the goals that must be achieved through specific tasks. Finally, the approach encourages frequent interaction among students.

TGFU is a student centred and game centred approach to teaching PE and gaming (Bechter et al., 2019). It can be implemented in both classroom and extracurricular settings (Harvey & Jarrett, 2014). This model was designed to help students appreciate how games are played and to generate interest in games (Bunker & Thorpe, 1986). As a student centred approach to teaching games (Bechter et al., 2019), TGFU focuses on addressing the needs of the students/players and modify games to make them more appropriate and enjoyable for children (Sproule et al., 2011). It is a constructivist approach to teaching and learning, as students are given more responsibility and actively participate in the learning process (Menezes-Fagundes et al., 2022).

In a constructivist approach, the students' prior data serves as a starting point (Suduc et al., 2015), disregarding the vast differences in their data and experiences (Butler & McCahan, 2005). This approach involves engaging students in research, experimentation, and discussions with others to draw new conclusions (Suduc et al., 2015). Effective learning occurs when students are appropriately connected

and challenged to the information, requiring higher –order psychological skills before applying their new knowledge and skills to a unique situation (Pizarro et al., 2017). TGFU facilitates this form of learning by shifting the teacher's role to that of a facilitator and placing greater responsibility on students to generate data for themselves and their peers (Lodewyk & Bracco, 2018). The teacher's role is still important in TGFU but prioritizes the students' active creation of knowledge instead of simply receiving information from the teacher.

Teachers need to convert learning theories into strategies in the classroom to meet the needs of all children/students. Many learning theories are widely accepted and prominent in today's educational environment, with each offering a different perspective of how a student's mind processes new information, each providing further guidance on how teaching can best meet the needs of the individual learner. As such this study was supported by constructivism theory and spectrum theory.

The traditional teaching approach is widely used in PE education worldwide and involves direct instructions from teachers in teacher-led PE classes (Moy et al., 2016). This approach limits student control and choice in determining tasks, which may lead to reduced student motivation. In contrast, providing students with more stimulating options in tasks can increase their interest and motivation to participate (Brittany, 2017).

Numerous studies have explored the teaching approach in intermediate schools and its effect on learning. Specifically, some studies have focused on the traditional teaching approach which involves separate teaching of different subjects. Their findings indicate that the traditional teaching approach has several shortcomings and flaws (Skrypchenko et al., 2018). For example, it fails to effectively transfer knowledge and power from the teacher to the students, resulting in a teacher- centred approach rather than a student-centred one. Additionally, students struggle to apply the knowledge acquired in the classroom (Andrew, 2019). He added, there is a lack of integration between the syllabi and learning skills.

In Iraq, PE teaching approaches in intermediate schools, especially in HBS (passing and shooting) lessons, are highly regarded and effective (Laeth & Duha, 2016). These approaches aim to enhance student's physical and mental qualities, aligning with the goals of the PE program. Proficiency in basic skills and the ability to perform them quickly and accurately are important factors in succeeding in PE. Previous studies have identified weakness in passing and shooting skills among intermediate school students, particularly in handball. The occurrence of numerous mistakes during the application of these skills was a significant issue. Saleh (2014) attributed these errors to factors such as the inappropriate exercises and teaching approaches.

Therefore, to address the study gap, there is a need to investigate the STA and TGFU approach as an intervention program to see the effect of constructivist learning theory and spectrum theory on intermediate school students' BHS compared to the TTA. This study intends to investigate the effects of the STA and the TGFU approach on students' acquisition of handball skills in intermediate PE classes. Specifically, this study investigates the impact of STA, TGFU, and TTA on intermediate school students' BHS. With this aim in mind, in this paper, we investigate in depth how the STA and the TGFU approach effect students' acquisition of basic skills in intermediate schools and determine which two approaches are suitable for intermediate school students.

METHODOLOGY

Research Design

This investigation opted for a Quasi experimental design (Creswell, 2012) to identify the disparities between the EGs and CG. This design has been chosen as the study investigates utilising the quantitative method of the effects of various PE STA, TGFU, and TTA on intermediate school students' BHS. In several instances in education, the EG is necessary because it cannot readily form EGs and CG for the experimental research study unless the random assignment is applied to all classes. Furthermore, the

convenience sampling method was used in intermediate schools with a Quasi experimental research design (Creswell, 2012).

Participants

The investigation was completed during an in-season school period, from May to June 2021. The sample consisted of nineteen eight grade male students, at the age of 13-14 years old from an intermediate school in Iraq/Baghdad. In this study, the three classes were randomly assigned into EGs and CG out of 6 classes that were part of the sample of the study. EG1 (N=30), EG2 (N=30) and CG (N=30) went through the PE syllabus set by the Ministry of Education Iraq. During the session, EG1 and EG2 underwent the dribbling and jump shooting handball skills with the STA and TGFU approach, while the CG went through the same skills using TTA. In this study, two teachers identified from the experimental groups who underwent STA and TGFU briefing workshops conducted by the researcher before the study. The study started with the timetable regulation set up by the school administration. Based on the eight-week lesson plan of the study, the handball PE classes were conducted for EGs and CG in the school field. Then, the pre-test was administered to the EGs and CG to measure students' acquisition of BHS before the first lesson is conducted. After eight handball PE lessons, the post-test was used to scrutinise students' acquisition of BHS.

Assumptions of The Test

The researchers checked the verification homogeneity of variance between the EGs and CG for the BHS for pre and post-test by using the box's M test before applying the SPANOVA test. However, the box's M test determines whether two or more covariance matrices are equal. Bartlett's test for homogeneity presented in the homogeneity of variances is derived from the box's M test. One caution: box's test is sensitive to departures from normality. If the samples come from non-normal distributions, then the box's M test may simply be testing for non-normality. The null hypothesis for this test is that the observed covariance matrices for the dependent variables are equal across groups. In other words, a nonsignificant test result indicates that the covariance matrices are equal. The box's M showed the homogeneity of covariance matrices across groups is assumed $F(20, 112457.252) = 1.501, p = 0.070 > 0.05$ the p-value greater than the 0.05 that's mean a nonsignificant test result indicates that the covariance matrices are equal.

Hence, this paper checked the verification homogeneity of variance between the EGs and CG for the BHS for pre and post-test utilising Levene's test before implementing the SPANOVA test. The acquired findings are presented in table 1.

Table 1

Levene "s test of homogeneity of variances basic handball skills

Basic Handball Skills	Levene Statistic	df1	df2	Sig.
Pre dribbling test	2.54	2	177	0.082
Pre jump shot test	1.186	2	177	0.308
Post dribbling test	0.151	2	177	0.860
Post jump shot test	0.587	2	177	0.557

Table 1 shows the significant value of Levene's test for pre-test and post-test of dribbling and jumps shot, indicating no significant differences between the CG and the EGs ($p > 0.05$). Because the covariance matrices for groups are equal, the researchers used Wilks' lambda test. Wilks' lambda is a test statistic used in multivariate analysis of variance to test whether there are differences between the means of identified groups of subjects on a combination of dependent variables.

Table 2
Wilks' lambda test for basic handball skills

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Test time	Wilks' Lambda	0.033	1689.064	3	175	0.000	0.967
Test time * Teaching Group	Wilks' Lambda	0.974	0.784	6	350	0.583	0.013

Table 2 shows no statistically significant difference in BHS based on three teaching approaches (TTA, STA, and TGFU), $F(6, 350) = 0.784, p > 0.05$; Wilk's $\Lambda = 0.978$, partial $\eta^2 = 0.013$. Firstly, to investigate the differences between related groups (time points), the differences between each combination of the related group (time point) must be determined. However, the variance of the difference between time 2 and time 3 is lesser than the other two combinations. This could lead us to conclude that our data violates the assumption of sphericity. We can, however, test our data for sphericity using a formal test called Mauchly's test of sphericity. As previously stated, Mauchly's test of sphericity is a formal way of testing the assumption of sphericity. Although this test has been heavily criticised, often failing to detect departures from sphericity in small samples and over detecting them in large samples, it is nonetheless a commonly used test. This is likely due to its automatic printout in SPSS for SPANOVAs and the lack of an otherwise readily available test. However, despite these shortcomings, because it is widely used, we will explain the test and how to interpret it in this section. Mauchly's test of sphericity tests the null hypothesis that the variances of the differences are equal. Thus, if Mauchly's test of sphericity is statistically significant ($p < 0.05$), we can reject the null hypothesis and accept the alternative hypothesis that the variances of the differences are not equal. Results from Mauchly's test of sphericity are shown below in Table 3.

Table 3
Mauchly's test of sphericity for handball skills

Within Subjects Effect	Mauchly's W	Approx. Chi-Square	df	Sig.
Test time	0.191	290.868	5	0.000

Table 3 Mauchly's test of sphericity indicated that the assumption of sphericity had not been violated, $\chi^2(2) = 290.868, p = 0.000$. Mauchly's test of sphericity tests the null hypothesis that the variances of the differences are equal. Thus, if Mauchly's test of sphericity is statistically significant ($p < 0.05$), we can reject the null hypothesis and accept the alternative hypothesis that the variances of the differences are not equal. However, there is a statistical difference in comparing the effects of STA, TGFU, and TTA on students' BHS was accepted.

FINDINGS

Hence, the tests of the within-subjects effects table tell us if there was an overall significant difference between the means at the different time points. The results for the test of within-subjects effects are obtained in Table 4 below.

Table 4
Test of within-subjects' effects for basic handball skills

Source		Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Test time	Greenhouse-Geisser	15128.915	1.528	9904.018	3724.256	0.000	0.955
Test time * teaching groups	Greenhouse-Geisser	5.814	3.055	1.903	0.716	0.546	0.008
Error (Test time)	Greenhouse-Geisser	719.021	270.377	2.659			

From this Table 4, the F value for the "time" factor, its associated significance level, and effect size ("Partial Eta Squared") is determined as the data obtained violated the assumption of sphericity. It can be described that when using an SPANOVA with a Greenhouse-Geisser correction, the mean scores for handball skills were statistically significantly different $F(1.528, 270.377) = 3724.256, p = 0.000 < 0.005$. The results presented in the previous table informed us that we have an overall significant difference in means for the Test time in BHS. Still, we do not know where those differences occurred. However, for the interaction between Test time and teaching groups, there were no statistically significant different $F(3.055, 270.377) = 0.716, p = 0.546 > 0.005$. Table 5 presents the results of the Bonferroni post hoc test, which allows us to discover which specific means differed.

Table 5
Pairwise comparisons in pre and posttest for basic handball skills

(I) Time	(J) Time	Mean Difference (I-J)	Std. Error	Sig. ^b	95% Confidence Interval for Difference ^b	
					Lower Bound	Upper Bound
1/Pre dribbling test	2	-6.744*	0.120	0.000	-6.981	-6.508
	3	-1.356*	0.053	0.000	-1.460	-1.251
	4	-11.539*	0.162	0.000	-11.859	-11.219
2/Pre jump shot test	1	6.744*	0.120	0.000	6.508	6.981
	3	5.389*	0.114	0.000	5.163	5.614
	4	-4.794*	0.096	0.000	-4.983	-4.606
3/Post dribbling test	1	1.356*	0.053	0.000	1.251	1.460
	2	-5.389*	0.114	0.000	-5.614	-5.163
	4	-10.183*	0.157	0.000	-10.493	-9.874
4/Post jump shot test	1	11.539*	0.162	0.000	11.219	11.859
	2	4.794*	0.096	0.000	4.606	4.983
	3	10.183*	0.157	0.000	9.874	10.493

Note.*. The mean difference is significant at the 0.05 level.

b. Adjustment for multiple comparisons: Least Significant Difference (equivalent to no adjustments).

Looking at Table 5, we need to remember the labels associated with the time points in our experiment from the within-subject effect table. This table gives us the significance level for differences between the individual time points. We can see that there was a statistically significant difference in pre dribbling test compared to post dribbling test into the intervention ($p < 0.05$) and from pre jump shot skill to post jump shot skill ($p = 0.000$). From the "Mean Difference (I-J)" column we can see that BHS were significantly reduced at this time point. However, for the multiple comparisons between teaching groups, which teaching groups have improved the BHS, the results are shown in Table 6 below.

Table 6

Multiple comparisons of the means in handball skills in teaching groups

(I) teaching group	(J) teaching group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
TTA	STA	-0.53*	0.177	0.009	-0.95	-0.11
	TGFU	-0.22	0.177	0.415	-0.64	0.19
STA	TTA	0.53*	0.177	0.009	0.11	0.95
	TGFU	0.30	0.177	0.203	-0.12	0.72
TGFU	TTA	0.22	0.177	0.415	-0.19	0.64
	STA	-0.30	0.177	0.203	-0.72	0.12

Note. The error term is Mean Square (Error) = 0.944;

*. The mean difference is significant at the 0.05 level.

Table 6 shows the results to compare the mean for the teaching groups (TTA, STA, and TGFU), which from this teaching approach, can improve the BHS compared to other teaching groups. For the TTA, there is a statistically significant difference between TTA and STA for STA because the $p = 0.009 < 0.05$. However, for the TGFU, there was no statistically significant difference because $p = 0.415 > 0.05$. Also, there is no statistically significant difference between TGFU and STA because $p = 0.203 > 0.05$ in improving BHS. Overall, the STA has improved BHS compared to TTA. The overall BHS estimated means could be highlighted as presented in figure 4.1 for time per and posttest for overall BHS and figure 4.2 for teaching approaches and BHS (dribbling test and jump shot test).

Mean scores for the EGs and CG in the BHS test (dribbling test and jump shot test) were calculated for pre and posttest; the results obtained are shown in Table 7.

Table 7

Estimate adjusted results for basic handball skills

Teaching group	Test	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
TTA	Pre dribbling test	1.38	0.085	1.215	1.551
	Pre jump shot test	7.95	0.195	7.566	8.334
	Post dribbling test	2.62	0.103	2.414	2.819
	Post jump shot test	12.68	0.274	12.143	13.224
STA	Pre dribbling test	1.63	0.085	1.465	1.801
	Pre jump shot test	8.53	0.195	8.149	8.918
	Post dribbling test	3.08	0.103	2.881	3.286
	Post jump shot test	13.5	0.274	12.960	14.040
TGFU	Pre dribbling test	1.48	0.085	1.315	1.651
	Pre jump shot test	8.25	0.195	7.866	8.634
	Post dribbling test	2.87	0.103	2.664	3.069
	Post jump shot test	12.93	0.274	12.393	13.474

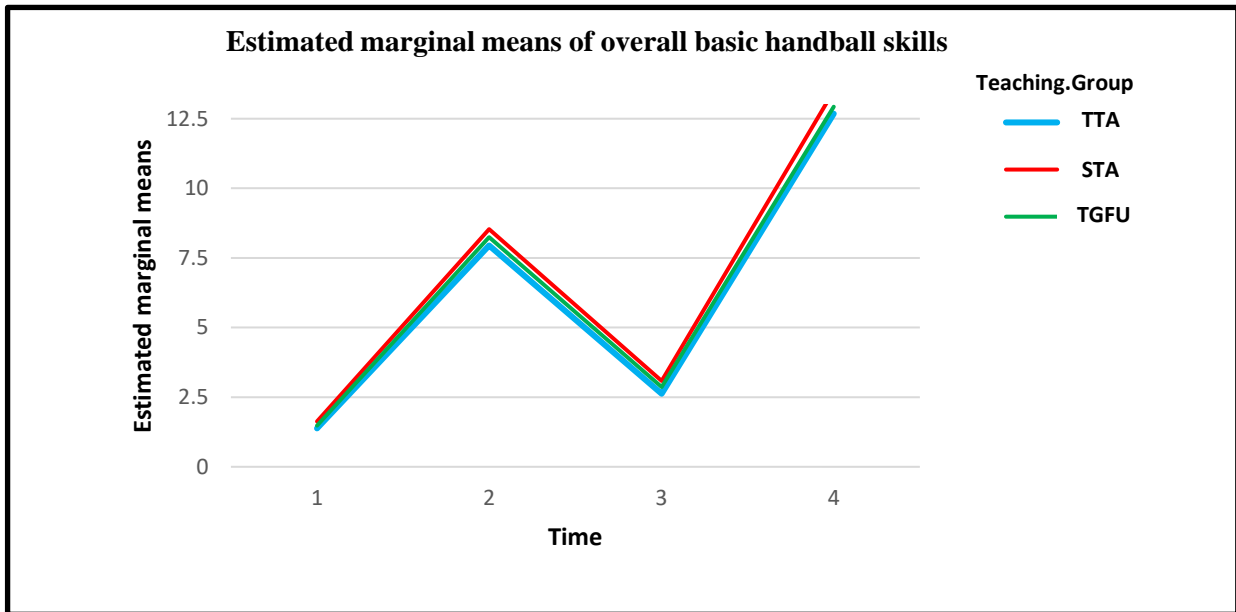


Figure 3. Estimated marginal means of overall basic handball skills.

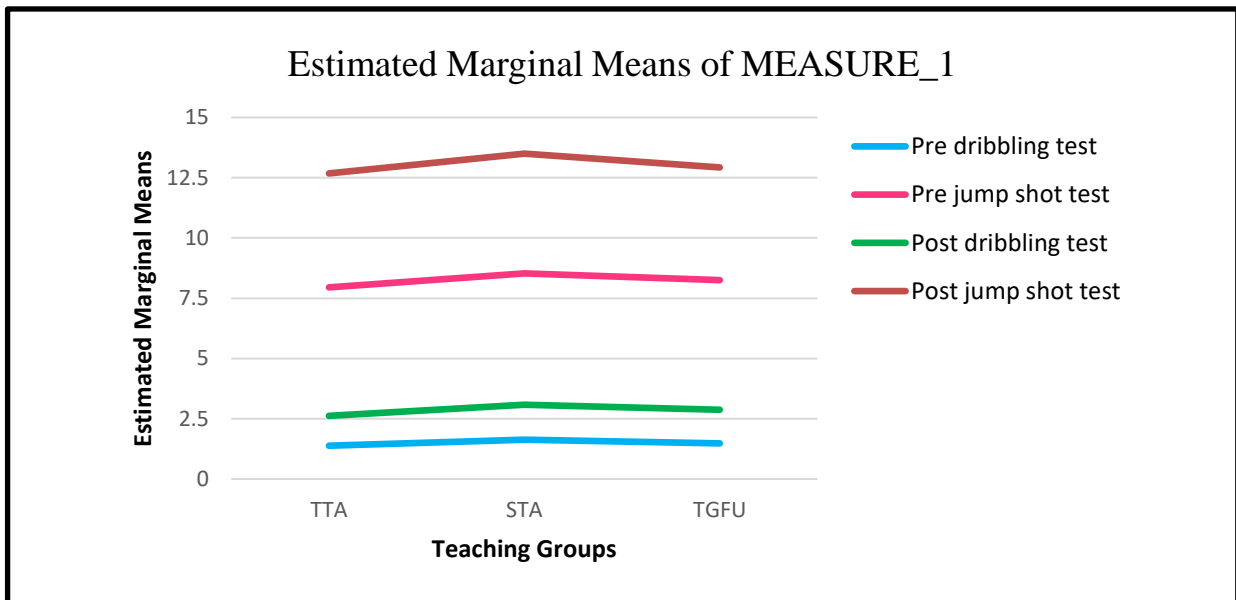


Figure 4: Estimated marginal means of teaching approach and test time for basic handball skills.

DISCUSSION

Therefore, it can be concluded that the STA affects more than the TGFU and TTA on students' learning outcomes in mean scores. This outcome may be clarified by the fact that students with the STA engaged in more effective skill practice exercises. The technical skills are improved with the framework of the teaching approach and not in isolation. Consequently, these exercises would have enhanced their skill acquisition in game situations during classes/practices sessions. Students have a deeper comprehension of when, where, and why these skills need to be implemented in games. Past studies analyses revealed that students' skill performance developed with the STA (Chatoupis & Vagenas, 2017; Digelidis et al., 2018; Sanchez et al., 2012). Hence, from all these findings, only the (Digelidis et al., 2018) study reported on junior high school students learning PE skills. The findings of (Digelidis et al., 2018) show that the self-check approach group had higher scores concerning intrinsic motivation and identified regulation than the reciprocal approach group. In comparison, the reciprocal approach group had higher scores concerning autonomy. Boys showed higher scores concerning basketball skills tests compared with girls in the mean scores.

The results compare the mean for the teaching groups (TTA, STA, and TGFU), which from this teaching approach, can improve the BHS compared to other teaching groups. For the TTA, there is a statistically significant difference between the TTA and the STA; however, for the TGFU approach, there was no statistically significant difference. Also, there is no statistically significant difference between TGFU and STA in improving BHS. Overall, the STA has improved BHS compared to the TTA. However, there is a statistical difference in comparing the effects of the STA, TGFU, and TTA on students' BHS. Therefore, the statistical difference was accepted for the STA and rejected for the TTA, and TGFU approaches.

Alanzi (2013) found that the grade levels and treatment types had no significant main effects on enjoyment or performance measures. However, the interaction between grade levels and treatment types significantly affected game performance. It was found that the participants from grade seven perceived significantly higher average performance scores with TGFU than traditional PE. However, the finding is reversed for grade eight participants. The grade eight participants perceived significantly higher average performance scores with TTA in PE than TGFU. However, Batez et al. (2021) investigated the effects of the TGFU model implemented in PE classes on volleyball skills and enjoyment in secondary school students. When examining the impact of the TGFU program on service accuracy, there was a significant main effect for time, with both groups improving their result after the six weeks of intervention. Still, the setting had no significant time or group and time effects. The findings show the effectiveness of the TGFU model in an educational context to improve volleyball skills. We also highlight the importance of enjoyment during these classes compared to traditional PE classes (Batez et al., 2021). The TGFU increased students' enjoyment in the PE class (Ab-Rahman et al., 2020).

On the contrary, the authors (Abdel-Hussein & Moheen, 2018) have conducted a study on the effect of teaching methods using exercise (intensive, distributor) in learning shooting from jumping and blocking in handball. The research aimed to: Identify the impact of teaching methods using exercise (intensive, distributor) in learning shooting from jumping and blocking in handball. Secondly, to identify the best approach in learning shooting from jumping and blocking in handball. The results showed the preponderance of the group that used the common approach distributor in learning jump shooting in handball and the preponderance of the group that used the reciprocal approach intensive in learning blocking in handball. The authors (Wang & Wang, 2018) investigated the effectiveness of TGFU intervention on moderate to vigorous physical activity (MVPA). However, no significant differences were determined between the MVPA levels of high and low skilled students. Data gathered through interviews suggested that the nature of the games, the small, sided team, the freedom and enjoyment experienced by the students through games may explain the high MVPA levels observed in the TGFU classes. The common approach distributor in learning shooting from jumping in handball and preponderance of the group used the reciprocal approach intensive in learning blocking in handball (Abdel-Hussein & Moheen, 2018). The learning environment created for students under the TGFU approach was not isolated from their peers or teachers, unlike the traditional teaching approach. The TGFU approach centred on learning experiences for children/students about defensive and offensive handball game tactics. The offensive

and defensive game tactics were taught over several stages of skill practice by playing modified versions of the game, unlike in the traditional skills approach. Therefore, in the TGFU approach, students could develop and modify the game to display skills such as leading, following, and decision making, which required active involvement with their environment. The study's finding has shown a source of effective ways of utilising the TGFU approach to provide learners with appropriate and effective tools to enhance learning outcomes in game performance (Balakrishnan et al., 2011). However, the TGFU approach needs time to apply to students, and there are many students in the classroom in Iraqi schools. The teachers do not give each student time to practice and improve BHS because there are no differences between the three approaches.

The study found that STA and TGFU can be effective instructional approaches to improve the BHS of intermediate school students. It can also be beneficial for the institutional and scientific advancement of PE by providing a vision of the importance of the union of cognitive and motor development for developing skills and a deep understanding of games and teaching spectrum approaches. The findings of this study suggest that teachers can use both the schools involved in the study and by other teachers to strengthen the spiritual aspect of the subject and can gain positive social gains such as increased cooperation and teamwork skills. However, teachers must carefully determine how they group students on physical abilities and avoid negative emotional consequences if students are not grouped appropriately.

The study's main contribution has been combining and applying STA (practice teaching approach) and TGFU to study the process of student learning in Iraq. This study is significant as it presents substantial evidence that the teaching approaches can significantly and positively affect the educational level of students during intermediate school. This is more prominent among the students learning in teaching approaches (i.e., STA and TGFU) as they develop great self-confidence, a sense of responsibility, and more motivation than those learning TTA. These results could help the stakeholders draw specific contributions and help the teachers and students become more aware of the effects. In addition, the study contributed to a better appreciation of how teachers may better manage the teaching stages of students learning. Comprehensive reviews add to a current study by identifying the relevance of teaching practice in understanding students' skills acquisition, handball skills, and its effect on the related learning process in terms that should be applied in the teaching stages of students learning.

Furthermore, this study enhances existing concepts through the application, validation, and extension of a newer theoretical scheme for managing the earlier steps of the learning aspect in educational classes. This investigation has also extended its coverage to teachers and students. To strengthen its findings, this investigation considered various contextual factors, including the academic environment. Hence theoretical contributions, with regard to the theoretical framework in the study, spectrum theory, and constructivism theory, were adopted to enhance students' BHS in PE. Students must be exposed to appropriate instructional methods and learning environments to achieve goals. The spectrum and constructivist theories linked the practice teaching approach and TGFU to students' BHS in PE. The elements of the theories that provided the latitudes or connection were active engagement, students centred learning, teacher, and substance. The features embedded in the practice teaching approach were selected based on the three essential components of any teaching exchange: teacher, student, and substance (Mosston & Ashworth, 2008) which has enhanced students learning in PE. The TGFU approach was selected based on the cognitive construction of game tactics, skills, and concepts (e.g., problem solving, learning understanding, skill execution, acquisition, social responsibilities, and effective group interaction) essential to PE (Rovegno & Dolly, 2006).

This study has filled the gap to create a satisfactory learning experience that improves students' BHS in PE using practical comprehension approaches (practice teaching approach and TGFU). These approaches emphasised activities through cognitive and learning processes such as practice, application, generating questions, clarifying, connecting, calculating, visualising, summarising, and giving feedback. Consequently, students learning experience is characterised by deep understanding, teamwork, teacher centred instruction, mastering new knowledge, and improved student learning skills in PE subjects.

These may have enhanced students' BHS in PE. The results of this study are supported by (R. A. Barba-Martín et al., 2020; Batez et al., 2021; El-Khoury et al., 2020; Farmer et al., 2022).

CONCLUSION

In the current study, the researchers investigated how the STA and TGFU have influenced the students' learning of BHS. The study was carried out on intermediate school students from Iraq. The researchers used different teaching approaches like the STA, TGFU, and TTA during the teaching/learning sessions in PE classes. The EGs comprised students taught using the STA and the TGFU, while the CG contained students taught using the TTA. Results from the current study show that STA and TGFU approaches can improve intermediate Iraqi students' learning of BHS compared with the TTA. Results revealed a statistically significant overall effect between pre and post-test for EGs. In comparison, results showed no statistically significant improvement between measures recorded in the STA and TGFU groups. Nevertheless, further research must be carried out on a different age group sample using different teaching approaches based on the current study to obtain a better and more significant outcome.

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