

**SPECTRUM AND TGFU APPROACHES: EFFECT ON PHYSICAL ABILITIES AMONG IRAQI SCHOOL STUDENTS**Ahmed Raad Yousif<sup>1</sup>\*Hutkemri Zulnaidi<sup>2</sup>Syed Kamaruzaman Syed Ali<sup>1</sup>

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**Abstract:** The ongoing underrepresentation of Iraqi school students in science, mathematics, and PE (SMPE) in general, and in particular, in PE, demonstrates the need to develop and implement strategic high-impact practice, such as new teaching approaches/methods or effective teaching strategy that not only improves students' academic outcomes but also fosters student development holistically. At Iraqi schools, there is a need to help Iraqi school students persist and keep interested in their discipline and their academic level; hence, this study aims at exploring the effects of various PE STA approach, TGFU, and TTA on intermediate school students' physical abilities. A total of 90 male students participated in the present study. In EGs, the STA and TGFU were employed for the EG1 and EG2, while the TTA was used for CG. The results of the SPANOVA test showed a significant effect of the STA and TGFU approaches in enhancing physical abilities 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, like investigating this tool's effectiveness in teaching other sports.

**Keywords:** Physical Education, Physical Abilities, Spectrum, TGFU, Traditional

**INTRODUCTION**

PE is a required topic in Iraqi elementary and intermediate schools. PE aims to enhance students' cognitive, psychomotor, and affective abilities (I. Mastrogiannis et al., 2017; Wright et al., 2004). While the purpose of PE is to provide students with the skills and information necessary to pursue a healthy lifestyle in their daily lives, these aims are not exclusive. PE teachers must focus on teaching and learning to foster student knowledge, learning, and enjoyment (Bywater, 2020; Coulter & Chroinin, 2013). Moreover, the inability to draw students to this subject may compromise the goals of developing physical abilities, the skill of movement and sports, and the application of health and safety knowledge as part of a healthy lifestyle. PE teaching and learning should provide additional opportunities for all students to increase the efficiency of their motor skills, movement, and physical capacities. Games and sports are a component of the PE curriculum. Approximately 65% of the curriculum is devoted to games and sports (Barba-Martín et al., 2020; Werner et al., 1996). Students must acquire fundamental sports and game skills to participate in sports and games. Therefore, PE teachers and students must pay more attention to skill development. PE teachers must understand their students' characteristics and the ability to create learning techniques or models that assist in attaining PE skills (Hanief & Subekti, 2010; Kristina et al., 2021).

The instructional approach and tactics are crucial to improving student participation and encouraging participation in class activities (Kiat et al., 2015). Nevertheless, teaching games in schools has stressed TTA (Metzler, 2017), which emphasise teaching specific skills and techniques and highly planned courses that include a warm-up, skill practises, and a final game. Haugen et al. (2021) reported that scholars had stressed the significance of rethinking and reforming PE's methodology. Teachers of PE should employ the appropriate instructional approach and PE pedagogical approach while designing effective learning games for PE. Based on prior research, the PE teaching technique entails making PE more motivating and fun. Teaching and learning require an effective methodology to keep students motivated, interested, focused, and engaged throughout the teaching and learning processes. Hence, teachers must give the most effective way of instruction in games and sports activities to meet the needs of students and increase their involvement and satisfaction in PE classes (Ab-Rahman et al., 2020).

### *Spectrum Approach On PE*

The teaching approach is a way of learning something to follow individual tendencies. Various theories and models of learning approaches have been put forward by scientific figures who can be practiced and used as a guide for teachers (Kamaruddin & Mohamad, 2011). In line with the opinion above, the teaching and learning process by using appropriate teaching strategies is critical to the effectiveness and efficiency of the learning process. Suggest that the general notion of strategy is "an outline of direction to act to achieve predetermined goals. From the overall teaching approaches mentioned in this study, one teaching approach was selected among Mosston teaching approaches for research material: The teaching approach in PE is known as the Mosston teaching approach, which consists of 11 teaching approaches, including command, practice, reciprocal, self-check, inclusion, guided discovery, convergent discovery, divergent discovery, learner-designed, learner-initiated, self-teaching (Yani & Henjilito, 2020).

According to Mosston and Ashworth (2008), the characteristic of the practice approach is independently practicing or in groups a memory/reproductive task with feedback. In the anatomy of the practice approach, the role of the teacher is to make all subject matter and logistical decisions and to provide feedback to the learners. The role of the learner is to independently practice or group practice a memory/reproduction task. The most accurate name for this landmark decision relationship is the independent practice approach or group practice. Despite the variety of characters that could be used to describe this behavior, it is vital to focus on the distribution of decisions that determine the learning objectives.

Teaching exercises approach (practice approach) the following are some of the benefits of the practice teaching approach, which makes it one of the most effective models for lessons: (1) The teacher will have the chance to instruct a large number of students simultaneously; (2) students will learn to work independently; (3) students will learn to make decisions following existing provisions; (4) students will learn about time constraints; (5) students can learn about goals that must be achieved by completing specific tasks, and (6) students will be required to interact with each other more frequently.

### *TGFU Approach On PE*

TGFU is a student-centered (Bechter et al., 2019; Griffin & Butler, 2005), game-centered approach to teaching PE and gaming that may be implemented in both classroom and extracurricular settings (Harvey & Jarrett, 2014). This model was designed to help students appreciate how the game is played and the notion that games are both acceptable and enticing (Bunker & Thorpe, 1986) to address some of the issues Bunker and Thorpe observed in their students. As a student-centered approach to teaching games (Bechter et al., 2019; Griffin & Butler, 2005), TGFU emphasizes the students/players who are interested in the games, ensuring their needs are met. Both educationally and by establishing a suitable domain by modifying the first, formal, grown-up adaptation of a game to one which is more appropriate for children to enjoy (Guadagnoli & Lee, 2004; Light, 2002a; Sproule et al., 2011); generally (Bunker & Thorpe, 1986). Despite the student being assigned at the core of the model, the student is given another role in the learning process as they are managed with more significant responsibility, making TGFU a constructivist approach to teaching/learning (Dyson, 2005; Griffin & Patton, 2005; Light, 2002a; Menezes-Fagundes et al., 2022; Oslin & Mitchell, 2006; Richard & Wallian, 2005).

### *Physical Abilities*

Physical ability and different teaching methods have a central role. According to the curriculum, students should understand how other training methods affect their bodies and get to know their bodies better (Heikkinen, 2017). It is also written in the knowledge requirements that the students should do different activities that improve their physical ability, and they should understand various aspects that influence their physical ability (Heikkinen, 2017), teaching and a knowledge of possible risks are also written in the knowledge requirements of PE, stated as: "Students can in detail and in a balanced way describe risk factors in connection with teaching and practice of the sport, and adapt teaching and practice to minimising risks" (Heikkinen, 2017).

Physical ability includes different skills; some can be improved by using different teaching approaches during the PE class. For example, muscular strength and muscular endurance, speed, agility, and physical abilities can be developed by doing any exercise during the educational lesson in school. These are common goals of teaching approaches and can develop physical ability (Angel, 2016).

In a constructivist approach, the students' past data is used as a starting point (Lemlech, 1998; Suduc et al., 2015; Turner, 2005), disregarding the vast differences in gauge data and experience (Butler & McCahan, 2005). To assist

them in constructing new data by effectively engaging with the material through research, experimentation, and conversations with others to draw new conclusions and generate new data in themselves (Lemlech, 1998; Richard & Wallian, 2005; Suduc et al., 2015). In fact, for learning to occur, students must be appropriately connected to the information and challenged in their current grasp, requiring higher-demand psychological skills before applying their new knowledge and skills to a unique situation (Pizarro et al., 2017; Richard & Wallian, 2005). This form of learning is made possible by TGFU because it shifts the teacher's role to that of a facilitator, placing greater emphasis and responsibility on the students to create data for themselves and their peers (Dyson, 2005; Lodewyk & Bracco, 2018). The teacher is not excluded from TGFU supervision; instead, the student's job comes out to be a higher priority than the conventional method of dealing with learning, as they must generate the material themselves rather than simply receiving it from the teacher (Light, 2002a; Parry, 2020).

Any teacher needs 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, so this study was supported by constructivism theory and spectrum theory.

### ***Problem Statement***

The most general PE teaching approach worldwide is the TTA (Moy et al., 2016). To explain that, a TTA involves direct instruction from PE teachers focusing on more "teacher-centered" or teacher-led PE classes. Using the TTA as an ordinary teaching approach, students are directed to use the TTA on what tasks to perform rather than having control or choice. Hence, the TTA may be connected to decreased student motivation in PE classes. In other words, if students are given more choices and options with different tasks that are more stimulating, their level of interest and motivation to participate is likely to increase (Brittany, 2017).

Many studies have been carried out to examine teaching approach in intermediate schools and their effect on learning subjects. Some of these studies that dealt with the TTA (separate teaching of different courses) in the education system concluded that the TTA has many shortcomings and flaws (A Fahiminezhad et al., 2012; Maleki, 2003). For example, the TTA to teaching fails in knowledge transfer and transfer of power from the teacher (teacher-centered) to student-centred), and the students are unable to move the knowledge they have acquired in the class (Andrew, 2019; A Fahiminezhad et al., 2012). Moreover, the TTA cannot create a link between the syllabi and learning skills well (Andrew, 2019; A. Fahiminezhad et al., 2012; Findley, 2000).

The PE program focuses on all students in the classes. Therefore, PE instructors are required to adopt methodologies and pedagogies to accommodate the variances among their students. Teaching approaches can help students effectively learn in PE classes (Kelly, 2011). Researchers have discussed the best delivery approaches and students' learning in PE classes. Furthermore, a brief study of handball and its relationship to general education is needed to appreciate the understanding and thoroughly study its parts together with identifying the problem that hindered its further development and favorite's progress. Hence, it is necessary to get a clear understanding and find out the issues of handball teaching in intermediate schools and students' physical abilities to improve their participation and knowledge through research.

## **MATERIALS AND METHODS**

### ***Research Design***

This investigation opted for a quasi-experimental design (Creswell, 2012), to determine the disparities between the experimental and control groups. This design has been chosen as the study investigates utilizing the quantitative method of the effects of various PE STA's, TGFU, and TTA on intermediate school students' physical abilities. 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 uses in intermediate schools with quasi-experimental designs (Creswell, 2012).

### ***Participant***

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 physical abilities 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 physical abilities before the first lesson is conducted. After eight handball PE lessons, the post-test was used to scrutinise students' acquisition of physical abilities.

### Measurement

According to (Al-Dulaimi, 2014), testing aims to assess the subject's ability to perform specific tasks accurately in keeping with the instructions. With this in mind, scientific data related to tests employed for assessing the performance of abilities were referred to for this investigation. The researchers constructed four ability tests for each physical ability. The discussion with experts decided on the procedure of these abilities tests by structuring the questionnaire for this study to facilitate an evaluation of the student's physical abilities. The researchers have chosen the most suitable ability tests for junior-level intermediate school students (Kangane, 2005; Khodaskar, 2017). Four tests were executed for each of the three physical abilities, i.e., strength, speed, and agility. The views of a team comprising specialists in this field were sought on the selection of tests and the appropriate setting for carrying out these tests. Data dumping follows the collection of forms to determine the percentage of each test. According to the experts, the study test percentage is 80% for the medicine ball test, the 30-meter dash, zig-zag agility test marked by the experts.

### Data Analysis

Subsequent to the input of data into SPSS and before the running of any inferential statistics, exploratory data analysis is conducted to decipher a range of descriptive statistics and graphs. Exploratory data analysis also detects data glitches that include outliers, abnormal distributions, coding issues, misplaced values, or flaws during the keying in of data. Other than the above, exploratory data analysis employees to ascertain the degree to which the suppositions of analysis of A split-plot analysis of variance (SPANOVA) combine pre-test and post-test to see the increase of interactions based on group and comparison between groups to measure the effect as well as assumptions of SPANOVA (assumption of independence, assumption of normality (skewness and kurtosis test), assumption of homogeneity of variances (Levene's test), assumptions of box's test of equality, and assumptions of Mauchly's test of sphericity), multiple comparisons, standard definition, and the mean score are utilised for the detection of disparities just for the EG's. SPANOVA and multiple comparisons for dependent samples are employed for responses to the research questions. SPANOVA combines pre-test and post-test with seeing the increase of interactions of the STA, TGFU and TTA for measuring the students' physical abilities based on the group. SPANOVA is preferred over other statistical methods due to the requirement for managing the effects of interval multiple dependent variables.

## FINDINGS

The researchers of the present study checked the verification of the homogeneity of variance between the EG's and CG for the physical abilities' skills for pre and post-test by using the Box's M Test before applying the SPANOVA test. However, box's M test determines whether two or more covariance matrices are equal. The Box's M indicates that the homogeneity of covariance matrices across groups is assumed  $F = 14.586$ ,  $p = 0.35$ . The p-value is greater than 0.05 that's means a non-significant test result indicates that the covariance matrices are equal. Hence, the present study checked the verification of the homogeneity of variance between the EG's and CG for the physical abilities' skills for pre and post-test by using Levene's Test before applying the SPANOVA test. The results obtained are shown in Table 1.

Table 1

*Levene's Test of Equality of Error Variances for Physical Abilities Skills*

Physical Abilities skills	Levene Statistic	df1	df2	Sig.
Pre-Medicine Ball Test	.915	2	177	.402
Pre The30 Meter Dash Test	.096	2	177	.909

Pre-Zig Zag Agility Test	.025	2	177	.975
Post-Medicine Ball Test	2.967	2	177	.054
Post The 30 Meter Dash Test	2.90	2	177	.058
Post-Zig Zag Agility Test	2.931	2	177	.056

Table 1 shows the significant value of Levene's test ( $p > 0.05$ ), indicating that no significant difference exists between the CG and EG's for the pre and post-test of medicine ball, pre the 30 meter dash, and for pre-zig zag agility. The 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 physical abilities skill*

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Squared	Eta
Test Time	Wilks' Lambda	.004	8279.193	5	173	.000	.996	
Test Time *Teaching Group	Wilks' Lambda	.883	2.228	10	346	.16	.061	

In table 2 shows there is no statistically significant difference in physical abilities based on three teaching approaches (TTA, STA and TGFU),  $F(10, 346) = 0.784$ ,  $p > .05$ ; Wilk's  $\Lambda = 0.883$ , partial  $\eta^2 = .061$ . Firstly, as we are interested in the differences between related groups (time points), we must calculate the differences between each combination of the related group (time point). However, the variance of the difference between Time 2 and Time 3 is much less than the other two combinations. This might lead us to conclude that our data violates the assumption of sphericity. However, test our data for sphericity using a formal test called Mauchly's test of sphericity. As mentioned, 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 probably due to its automatic printout in SPSS for SPANOVA 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 ( $p < .05$ ), we can reject the null hypothesis and accept the alternative hypothesis that the variances of the differences are unequal. Results from Mauchly's test of sphericity are shown below in table 3.

Table 3

*Mauchly's test of sphericity for physical abilities skill*

Within Subjects Effect	Mauchly's W	Approx. Chi-Square	df	Sig.
Test time	.000	5110.698	14	.000

Table 3 Mauchly's test of sphericity indicated that the assumption of sphericity had not been violated,  $\chi^2(2) = 5110.698$ ,  $p = .000$ . 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 ( $p < .05$ ), we can reject the null hypothesis and accept the alternative hypothesis that the variances of the differences are unequal. However, there is a statistical difference in comparing the effects of the STA, TGFU, and TTA on students' physical abilities skill was accepted. In addition, The tests of within-subjects effects table tells 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 tests of within-subjects effects on physical abilities skill*

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Test time	Greenhouse-Geisser	11976426.564	1.015	11797130.969	573.854	.000	.764
Test time * teaching group	Greenhouse-Geisser	33526.194	2.030	16512.142	.803	.451	.009
Error (Test time)	Greenhouse-Geisser	3694015.742	179.69	20557.705			

From this table 4, we can discover the F value for the "time" factor, its associated significance level, and effect size ("Partial Eta Squared") as our data violated the assumption of sphericity. We can report that when using SPANOVA with a Greenhouse-Geisser correction, the mean scores for physical abilities were statistically significantly different  $F(1.015, 179.69) = 573.854, p < .005$ , Partial Eta Squared = 0.764. The results presented in the previous table informed us that we have an overall significant difference in means, but we do not know where those differences occurred. However, for the interaction between test time and teaching groups, there were not statistically significantly different  $F(2.030, 179.69) = 0.803, p = 0.451 > .005$ . 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 post-test for physical abilities

(I) Time	(J) Time	Mean Difference (I-J)	Std. Error	Sig. <sup>b</sup>	95% Confidence Interval for Difference <sup>b</sup>	
					Lower Bound	Upper Bound
1/ Pre Medicine Ball Test	2	214.006*	1.050	.000	211.934	216.077
	3	214.061*	1.046	.000	211.996	216.126
	4	-18.856	11.683	.108	-41.912	4.201
	5	213.300*	1.052	.000	211.224	215.376
	6	213.272*	1.047	.000	211.205	215.339
2/ Pre 30 Meter Dash Test	1	-214.006*	1.050	.000	-216.077	-211.934
	3	.056	.072	.439	-.086	.197
	4	-232.861*	11.774	.000	-256.097	-209.625
	5	-.706*	.072	.000	-.848	-.563
3/ Pre Zig Zag Agility Test	6	-.733*	.071	.000	-.874	-.593
	1	-214.061*	1.046	.000	-216.126	-211.996
	2	-.056	.072	.439	-.197	.086
	4	-232.917*	11.779	.000	-256.162	-209.672
	5	-.761*	.080	.000	-.918	-.604
	6	-.789*	.055	.000	-.898	-.680
4/ Post Medicine Ball Test	1	18.856	11.683	.108	-4.201	41.912
	2	232.861*	11.774	.000	209.625	256.097
	3	232.917*	11.779	.000	209.672	256.162
	5	232.156*	11.775	.000	208.919	255.392
	6	232.128*	11.778	.000	208.884	255.371
5/ Post 30 Meter Dash Test	1	-213.300*	1.052	.000	-215.376	-211.224
	2	.706*	.072	.000	.563	.848
	3	.761*	.080	.000	.604	.918
	4	-232.156*	11.775	.000	-255.392	-208.919
6/ Post Zig Zag Agility Test	6	-.028	.081	.731	-.187	.132
	1	-213.272*	1.047	.000	-215.339	-211.205
	2	.733*	.071	.000	.593	.874
	3	.789*	.055	.000	.680	.898
	4	-232.128*	11.778	.000	-255.371	-208.884
5	.028	.081	.731	-.132	.187	

Looking at table 5 above, 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

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time points. We can see that there was a statistically significant difference in pre- medicine ball test compared to post the 30 meter dash test into the intervention ( $p < .05$ ) and from pre- zig zag agility skill to post- medicine ball test ( $p = .000$ ). From the "Mean Difference (I-J)" column we can see that physical abilities skills were significantly reduced at this time point. However, for the multiple comparisons between teaching groups, which teaching groups have to improve their physical abilities, the results show in Table 6 below.

Table 6

*Multiple comparisons of the means in physical abilities 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	-6.77	4.880	.350	-18.30	4.77
	TGFU	-1.14	4.880	.970	-12.68	10.39
STA	TTA	6.77	4.880	.350	-4.77	18.30
	TGFU	5.63	4.880	.483	-5.91	17.16
TGFU	TTA	1.14	4.880	.970	-10.39	12.68
	STA	-5.63	4.880	.483	-17.16	5.91

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 physical abilities compared to other teaching groups. For the TTA, there is no statically significant difference between the TTA and STA for the STA because the  $p = 0.35 > 0.05$ ; however, for the TGFU, there was no statically significant difference because  $p = 0.97 > 0.05$ , also there is no statically significant difference between TGFU and STA because  $p = 0.483 > 0.05$  in improving the physical abilities. Overall, there is no comparison between the STA, TTA, and TGFU in enhancing physical abilities. The overall physical abilities skills estimated means could be highlighted as presented in figure 1 for time per and post-test for general physical abilities and figure 2 for teaching approaches and physical abilities skills (medicine ball, the 30 meter dash, and zig zag agility). Mean scores for the EG's and CG in the physical abilities skills (medicine ball test, the 30-meter dash test, and zig zag agility test) were calculated for pre and post-tests; the results obtained are shown in Table 7.

Table 7

*Estimate adjusted results for physical abilities skills*

Teaching Group	Time	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
TTA	Pre Medicine Ball Test	214.133	1.813	210.555	217.712
	Pre 30-Meter Dash Test	5.900	.456	5.000	6.800
	Pre Zig Zag Agility Test	7.100	.389	6.333	7.867
	Post Medicine Ball Test	221.217	20.395	180.969	261.465
	Post 30-Meter Dash Test	5.200	.372	4.465	5.935
	Post Zig Zag Agility Test	4.800	.348	4.113	5.487
STA	Pre Medicine Ball Test	218.183	1.813	214.605	221.762
	Pre 30-Meter Dash Test	10.400	.456	9.500	11.300
	Pre Zig Zag Agility Test	8.000	.389	7.233	8.767
	Post Medicine Ball Test	256.067	20.395	215.819	296.315
	Post 30-Meter Dash Test	5.800	.372	5.065	6.535
	Post Zig Zag Agility Test	5.700	.348	5.013	6.387
TGFU	Pre Medicine Ball Test	214.850	1.813	211.272	218.428
	Pre The30-Meter Dash Test	8.300	.456	7.400	9.200
	Pre Zig Zag Agility Test	7.400	.389	6.633	8.167
	Post Medicine Ball Test	226.450	20.395	186.202	266.698
	Post 30-Meter Dash Test	5.600	.372	4.865	6.335
	Post Zig Zag Agility Test	5.100	.348	4.413	5.787

Table 7. reveals the means scores for the EG's and CG in the physical abilities' skills (medicine ball test, the 30-meter dash test, and zig zag agility test) were close. The mean score for the CG in the pre-medicine ball test for the TTA group was ( $M = 214.13$ ), while the mean score of the EG1 in the pre-medicine ball test for STA was ( $M$

= 218.18). However, the mean score of the EG2 in the pre-medicine ball test for TGFU was (M = 214.85), respectively. Whereas, for the 30-meter dash skill, the mean score for the CG in the pre the 30-meter dash test for the TTA group was (M = 1.62), while the mean score of the EG1 in the pre the 30-meter dash test for the STA was (M = 1.82). However, the mean score of the EG2 in the pre the 30-meter dash test for TGFU was (M = 1.72) respectively. However, for the zig zag agility skill, the mean score for the CG in the pre-zig zag agility test for the TTA group was (M = 1.5), while the mean score of the EG1 in the pre zig zag agility test for STA was (M = 1.78). However, the mean and SD of the EG2 in the pre zig zag agility test for TGFU was (M = 1.70), respectively.

The means scores for the EG's and CG in the physical abilities' skills (medicine ball test, the 30-meter dash test, and zig zag agility test) were close. The mean score for the CG in the post-medicine ball test for the TTA group was (m = 221.22), while the mean score of the EG1 in the post-medicine ball test for STA was (M = 256.07). However, the mean score of the EG2 in the post medicine ball test for TGFU was (M = 226.45) respectively. Whereas, for the 30-meter dash skill, the mean score for the CG in the post the 30-meter dash test for the TTA group was (M = 1.95), while the mean score of the EG1 in the post the 30-meter dash test for STA was (M = 2.88). However, the mean score of the EG2 in the post the 30-meter dash test for TGFU was (M = 2.43) respectively. However, for the zig zag agility skill, the mean score for the CG in the post zig zag agility test for the TTA group was (M = 2.32), while the mean score of the EG1 in the post zig zag agility test for STA was (M = 2.60). However, the mean score of the EG2 in the post-zig zag agility test for TGFU was (M = 2.43), respectively.

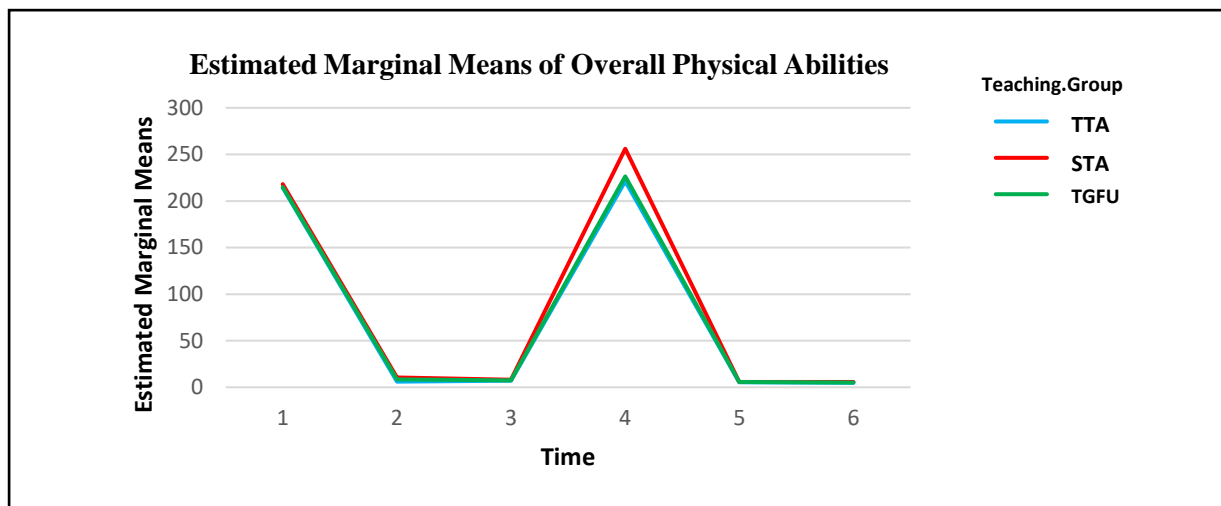


Figure 1. Estimated Marginal Means of Overall Physical Abilities Skills

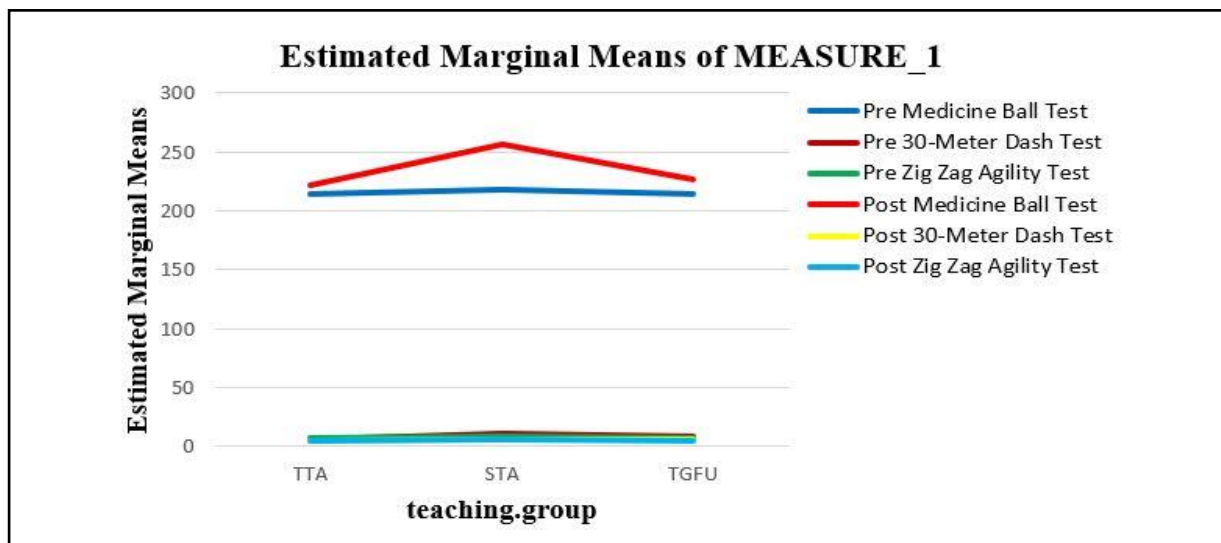


Figure 2. Estimated Marginal Means of Teaching Approach and Test Time for Physical Abilities Skills



## DISCUSSION

The findings revealed that students with a STA had a higher score in mean score on students' physical abilities compared to students with a TGFU and TTA. Therefore, it can be concluded that the STA affects more than the TGFU and TTA on students' physical abilities in mean scores. This result may be explained by the fact that students with the STA went through better activities as skill practice. The technical skills are developed within the context of the teaching approach and not in isolation. Therefore, these activities would have improved their physical abilities in PE during the class and skill test. Past literature analysis showed that in intermediate school students in PE classes, there was no significant mean difference with regard to the basic physical abilities in PE lessons (Prieto-Ayuso & Martínez-Gorroño, 2017; Raga et al., 2013). Hence, from all these findings, only the Prieto-Ayuso and Martínez-Gorroño (2017) study reported on junior high school students with basic physical abilities in PE. Therefore, the findings of this study will contribute to knowledge about intermediate students learning of learning outcomes in PE classes. The findings of Prieto-Ayuso and Martínez-Gorroño (2017) show that mean differences do not have statistically significant values. Therefore, equality of variances between the two groups was assumed; they revealed a negative relationship for the cooper test, medicine ball throw test, and deep flexion test.

Conversely, the 50m tests revealed a positive relationship. Furthermore, none of the correlations proved to be significant. Lastly, their study showed no statistically significant differences between male and female students' physical abilities.

The results compare the mean for the teaching groups (TTA, STA and TGFU), which from this teaching approach can improve the physical abilities compare to other teaching groups. For the TTA, there is no statically significant difference between the TTA and the STA for the STA; however, for the TGFU, there was no statically significant difference. Also, there is no statically significant difference between the TGFU and the STA in improving physical abilities. Overall, there is no comparison between the STA, TTA, and TGFU to enhancing physical abilities. Overall, there is a statistical difference in comparing the effects of the STA, TGFU, and TTA on the student's physical abilities were rejected.

Students' active cognitive engagement in constructing their knowledge constitutes a more effective teaching strategy than the typical teaching strategy of demonstration, explanation, and practice, which perceives learning as a reproductive process. Moreover, the consideration of student preconceptions in formulating the appropriate questions for inducing cognitive conflict provides a promising teaching proposal in the context of the dialectical methodology of the tactical approach of TGFU. To conclude, no statistically significant improvement was exhibited in the control and specific teaching strategy groups (P. Mastrogiannis et al., 2017).

The STA and TGFU have proved to be essential tools for improving students learning, such as physical abilities, as indicated in the findings in this study. Furthermore, this study revealed that STA and TGFU might be especially useful in intermediate school and probably other levels of education. The findings of this study show that STA and TGFU can be effective instructional approaches to improve the physical abilities of intermediate school students. Therefore, this study has contributed to the existing literature on PE. It could also be of interest to 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 STA.

The findings presented in this study provide information that teachers can use both in the schools involved in the study and by other teachers. Such recommendations indicate that the deliberate incorporation of values into STA and TGFU could strengthen the spiritual aspect of the subject. In addition, the participants in this study perceived that many positive social gains, such as increased cooperation and teamwork skills, can be learned from STA and TGFU. However, teachers must carefully determine how they group students during physical abilities. If students are not grouped appropriately, some students can have negative emotional consequences. STA and TGFU as a tool for teachers to improve student attention levels. For example, teachers may determine when student attention levels are dropping and then use PE to enhance their students' learning capabilities and physical abilities.

The main contribution of the research has been the combination and application of concepts STA (practice teaching approach) and TGFU to study the process of the students 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

the students 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 research 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, physical abilities, and its effect on the related learning process in terms that should be applied in the teaching stages of students learning. Furthermore, this research 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. Towards strengthening its findings, this investigation considered various contextual factors, including the educational environment.

Hence theoretical contributions, with regard to the theoretical framework in the study, spectrum theory, and constructivism theory, were adopted to enhance students' physical abilities in PE. Students must be exposed to appropriate instructional methods and learning environments to achieve goals. The spectrum theory and the constructivist theory link the practice teaching approach and teaching game for understanding approach to students' physical abilities in PE. The elements of the theories that provided the latitudes or connection were active engagement, students centered 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., learning understanding, problem-solving, skill execution, skill acquisition, social responsibility, and effective group interaction) are critically important in PE (Rovegno & Dolly, 2006).

The gap this study has filled was to create a satisfactory learning experience that improves students' physical abilities in PE using practical comprehension approaches (practice teaching approach and teaching game for understanding approach). These approaches emphasized activities through cognitive and learning processes such as practice, application, generating questions, clarifying, connecting, calculating, visualizing, summarizing, and giving feedback. Consequently, students learning experience is characterized by deep understanding, teamwork, teacher-centered instruction, mastering new knowledge, and improved student learning skills in PE subjects. These may have enhanced students' physical abilities in PE. The results of this study are supported by (Barba-Martín et al., 2020; Batez et al., 2021; El-Khouri et al., 2020; Farmer et al., 2020).

Furthermore, the real value of research does not involve only coming up with solutions to a problem (under study) but also highlighting new issues worthy of research and analysis. The researchers focused on three classes of selected Iraqi schools only. Therefore, the researchers suggest the following studies in the future; Conduct a similar study to the current research to find out the effect of the STA and TGFU at different levels, such as primary schools, teachers' institutes, and college students, not only for PE classes but also for different subjects. They may consider other demographic variables such as cultural background and educational level. The effects of the STA and TGFU among students of various educational levels and subjects not only with physical abilities but with other variables such as (physical activities, academic performance, motivation, and engagement in the learning process). Conduct a similar study of the current one with larger and differentiated samples in more and different types of skills, as well as in several areas of development (cognitive, emotional, social, moral). Conduct a similar study to the current one using qualitative research design using observation, interview, and document analysis as research instruments.

In summary, several questions can be explored explicitly in future research. Specifically, researching into students from different backgrounds and levels of education, the extent to which their physical abilities could possibly be developed, as well as better support for students to engage in the group STA and TGFU.

## CONCLUSION

In the current study, the researchers have investigated the way of teaching approaches (STA and TGFU) have influenced the students' physical abilities. The study was carried out on intermediate school students from Iraq. The researchers used different teaching approaches like the STA, TGFU, and the TTA during the teaching/learning sessions in PE classes. The EG's 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' physical abilities compared with the TTA. Results revealed a statistically significant main effect between pre and post-test for EG's. 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 and using different teaching approaches based on the current study to obtain a better and more significant outcome.

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