

The effect of learning models on creativity, knowledge and big ball game skills in high school students

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Abstract: This study aims to analyze learning model from TGFU, sport education, is suitable for high, medium, and low achievement students towards creativity, knowledge and skills of big ball games in PE learning for high school students. The update of the research obtained by the author tries to continue the research on the basis suggested by previous researchers, namely using an experimental design in which the pre-test scores with existing groups can also be controlled. The sample was divided into three groups which included; the TGFU group of 64 students; the Sport Education group of 58 students; the control group of 59 students. Given treatment twice every week for eight weeks. The data were processed statistically using one-way analysis of variance and multiple linear regression analysis. For this reason, analysis prerequisite tests are needed, including: normality test, variance homogeneity test, linearity test, and multicollierity test. The results of data analysis indicated; the TGFU learning model was able to increase students' creativity by 17.76%; student knowledge 87.18%; and student skills 19.93%; SE learning model in being able to increase student creativity by 14.71%; student knowledge 64.08%; and student skills 24.28%; There is a significant difference between the TGFU, sports education and traditional learning models in influencing the improvement of creativity in big ball games. The conclusion of the research results can be concluded that there is a significant effect on the TGFU learning model on increasing creativity, knowledge, and big ball game skills.

Keywords: Model, learning, creativity, knowledge, skills

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Introduction

Physical education, sports and health (PE) is focused values-based learning to cultivate

the skills needed in the 21st century. PE, in essence is an educational process that utilizes physical activity to produce holistic changes in individual qualities, both in terms of physical, mental and emotional. PE treats children as a unified whole, and social beings. Through PE, it can develop skills, knowledge, and build students' confidence and competence in facing challenges as individuals or groups, through various learning activities.

In PE learning, many learning models have been developed. With these developments, of course, it can make it easier for a teacher to carry out learning on various kinds of goals to be achieved. However, in reality there are still many PE teachers who still do not understand the model. This statement is in accordance with the results of that in such an approach or learning model, in everyday practice, PE is still limited because teachers do not recognize it as a typical pedagogical approach, but as a teaching practice (1).

The learning model in PE is a conceptual framework that describes a systematic procedure in organizing learning experiences to achieve certain learning objectives and serves as a guide for teachers in carry out teaching and learning activities. Teaching games for understanding (TGFU) is a learning model that focuses on developing student abilities in playing games to improve performance in physical activities (2-4). Sport education is a learning model which gives students the freedom to take on roles in their interests and abilities.

The advantage of PE learning is that it can improve student psychomotor abilities and academic achievement (5). As an approach, the TGFU and sport education models are used by teachers as a game approach and as a means to develop student tactical skills and knowledge, while engaging in physical activity. The above statement needs to be investigated more deeply related to the renewal of research on the TGFU learning model and sport education about effectiveness in knowledge. The knowledge in question is physical education knowledge that emphasizes the relationship between theory and practical skills.

In this case, the researchers tried to examine students with high, medium, and low PE scores, which were suitable for the PE learning model. Based on the description above, it was necessary to conduct a study related to which learning model from TGFU, sport education, is suitable for high, medium, and low achievement students towards creativity, knowledge and skills of big ball games in PE learning for high school students.

Methods

The study is a 2x3 factorial blinded randomized controlled trial conducted in 2019, in accordance with the principles of the Helsinki Declaration, after receiving approval from the Universitas Negeri Surabaya. The participants of the study were asked in advance to approve the research. The purpose and contents were explained, and written informed consent was obtained from all participants and parents.

Participants

In this study, the sample used was students at schools that represented the strata that had been made, namely high, medium and low. To determine the student's physical education value, the researcher held a pre-test about knowledge about physical education. After the test was carried out, the researchers grouped them based on high, medium, and low physical education scores. Sampling was done by random sampling technique. Namely for the determination of school sampling, which has homogeneous characteristics, it

means that the ability to move in participating in physical education learning activities has the same ability. Because physical education learning is classical, there is no need for a separation between sons and daughters. The schools used in this sample have the same characteristics starting from their location, students' abilities, and their teaching staff.

Measurement

Student creativity test used a Likert scale with the aim of capturing the level of creativity of students in learning physical education (6). A person's level of creativity can be measured through the aptitude trait or cognitive traits of creativity and non-aptitude traits, or affective traits of creativity. The creativity test had a validity of 0.9414. The knowledge test in question was a physical education study field test. The instrument was tested, then the items analyzed. The knowledge test has a validity of 0.8365. For big ball game skills such as volleyball, basketball, and football, by adopting existing skill tests. It's just that the test adjusts to the lesson plan at the time of learning. For the skill test has a validity of 0.8876.

Statistical analysis

Data analysis was performed using one-way analysis of variance (oneway ANOVA), and multiple linear regression analysis (multiple regression), using SPSS Statistics 16. To fulfill the assumption of one-way variance, a prerequisite analysis test was required, namely the normality test using the Kolmogrov Smirnov formula, homogeneity of variance test using Box's Test of Equality of Covariance Matrices, linearity test using Test for Linearity with a significance level of 0.05. Two variables can be said to have a linear relationship if the significance (Linearity) is less than 0.05, and the multicollinearity test is carried out by looking at Tolerance and VIF. If the tolerance is close to 1, and the VIF is not more than 10, it is concluded that there is no multicollinearity.

Ethical approval

The research related to human use complied with all the relevant national regulations, institutional policies and the Declaration of Helsinki. The research was approved by the Universitas Negeri Surabaya, Indonesia (Faculty of Sports Sciences and Physical Education) Scientific Committee. Informed consent was obtained from the directors of the club, the players' legal guardians and the players included in this study.

Results

The results showed that there was very high creativity in the TGFU group as much as 4.7%, in the sport education group as much as 3.4%, while in the control group there was none (see table 1).

Table 1. Student creativity in the big ball game

Creativity	Pre-test			Post-test		
	TGFU (64)	SE (58)	Control (59)	TGFU (64)	SE (58)	Control (59)
Very High	0	0	0	3 (4.7%)	2 (3.4%)	0
High	11 (17.2%)	11 (19.0%)	10 (16.9%)	61 (95.3%)	51 (87.9%)	51 (86.4%)
sufficient	52 (81.3%)	79.3 (49%)	49 (83.1%)	0	0	8 (13.6%)
Low	1 (1.6%)	1 (1.7%)	0	0	0	0

Very low	0	0	0	0	0	0
mean±sd	129.27±9.8	129.72±9.1	129.54±8.0	152.23±9.5	148.81±8.7	143.83±8.1
	9	4	2	2	1	9

Furthermore, knowledge was very high, in the TGFU group as much as 28.1%, in the sports education group as much as 13.8% and in the control group as much as 3.4% (see table 2).

Table 2. Student knowledge in big ball game

Knowledge	Pre-test			Post-test		
	TGFU (64)	SE (58)	Control (59)	TGFU (64)	SE (58)	Control (59)
Very High	0	0	0	18 (28.1%)	8 (13.8%)	2 (3.4%)
High	2 (3.1%)	1 (1.7%)	3 (5.1%)	30 (55.2%)	32 (55.2%)	32 (54.2%)
Sufficient	35 (54.7%)	33 (56.9%)	29 (49.2%)	16 (25%)	18 (31%)	24 (40.7%)
Low	22 (34.4%)	24 (41.4%)	27 (45.8%)	0	0	1 (1.7%)
Very low	5 (7.8%)	0	0	0	0	0
mean±sd	9.75±3.14	10.33±2.89	9.97±2.95	18.25±3.40	16.95±2.76	15.76±2.72

Meanwhile, skills were in the very high category, in the TGFU group there are 10.9% students, in the sports education group as many as 29.3%, while in the control group as much as 3.4% (see table 3).

Table 3. Student knowledge in big ball game

Skill	Pre-test			Post-test		
	TGFU (64)	SE (58)	Control (59)	TGFU (64)	SE (58)	Control (59)
Very High	0	0	0	7 (10.9%)	17 (29.3%)	2 (3.4%)
High	19 (29.7%)	24 (41.4%)	24 (41.4%)	54 (84.4%)	40 (69.0%)	48 (81.4%)
Sufficient	42 (65.6%)	32 (55.2%)	32 (55.2%)	3 (4.7%)	1 (1.7%)	9 (15.3%)
Low	3 (4.7%)	2 (3.4%)	2 (3.4%)	0	0	0
Very low	0	0	0	0	0	0
mean±sd	39.09±4.1	40.16±3.9	39.68±3.7	46.88±3.8	49.91±3.2	45.27±3.8
	4	2	2	1	0	3

There was a significant difference in the increase in creativity between the TGFU treatment group and the Sport Education treatment group, with a mean difference of 3.88 and a p-value of 0.002 ($p < 0.05$). There was a significant difference in the increase in knowledge between the TGFU treatment group and the sport education treatment group with a mean difference of 1.88 and a p-value of 0.000 ($p < 0.05$). This gives an understanding that learning with TGFU is better in increasing creativity and knowledge, when compared to learning Sport Education. There is a significant difference in skill improvement between the TGFU treatment group and the Sport Education treatment group with a mean difference of -1.98 and a p-value of 0.003 ($p < 0.05$). This gives an understanding that learning with sport education is better in improving skills, when

compared to learning with TGFU (see table 4).

Table 4. Further test with LSD (least significant difference)

Data	Between groups	Mean differences	SE	p
Creativity				
Post-test	TGFUxSport Education	3,42	1,640	0,034*)
	TGFUxControl	8,40	1,597	0,000*)
	Sport EducationxControl	4,98	1,636	0,003*)
Enhancement	TGFUxSport Education	3,88	1,251	0,002*)
	TGFUxControl	8,68	1,246	0,000*)
	Sport EducationxControl	4,80	1,276	0,000*)
Knowledge				
Post-test	TGFUxSport Education	1,30	0,543	0,018*)
	TGFUxControl	2,49	0,540	0,000*)
	Sport EducationxControl	1,19	0,554	0,034*)
Enhancement	TGFUxSport Education	1,88	0,380	0,000*)
	TGFUxControl	2,70	0,378	0,000*)
	Sport EducationxControl	0,82	0,387	0,035*)
Skill				
Post-test	TGFUxSport Education	-3,07	0,660	0,000*)
	TGFUxControl	1,60	0,657	0,016*)
	Sport EducationxControl	4,64	0,673	0,000*)
Enhancement	TGFUxSport Education	-1,98	0,649	0,003*)
	TGFUxControl	2,19	0,646	0,001*)
	Sport EducationxControl	4,17	0,662	0,000*)

*) significant at the 5% significance level ($p < 0.05$)

Discussion

This study proved that there was a significant positive effect of the TGFU learning model in PE on students to increase creativity, as well as knowledge and skills in the big ball game. The TGFU learning model was able to increase student creativity by 17.76%; increase student knowledge by 87.18%; and improve student skills by 25.29%. The results of this study were in line with other research (3-8), which showed that students whose learning using the TGFU method can increase knowledge significantly higher. The application of the TGFU learning model has proven to be more effective for basketball games and knowledge.

Students who are taught using the TGFU model can think critically, so they can apply the knowledge and strategies that have been learned in physical education (9). This is useful for other PE materials, making it easier for teachers in the learning process. Therefore, increasing physical activity based on the knowledge gained in physical education classes can provide a healthier lifestyle.

The TGFU learning model is a student-centered learning model in teaching the learning process, using games as a means to improve student cognitive abilities and skills (4-12). According to the underlying philosophy, that students become able to understand and successfully apply lesson principles and strategies to meet physical, social and cognitive development. Based on the results of the research and the results of a review of research journals, the authors can conclude that the TGFU learning model can increase

creativity, knowledge and skills in playing big ball.

This study also proved that there is a significant positive effect on the sport education learning model in PE for students, on increasing creativity, knowledge and skills in the big ball game. The sport education learning model is able to increase student creativity by 14.71%; increase student knowledge 64.08%; and improve student skills by 24.28%. The results of this study are in line with other research (13) that showed significance of learning PE using the sport education method to increase cognitive and skills in games during one competition season. In general, 31 research studies (14) found a positive effect of the sport education model (15). The positive effect of learning through the sport education method is to increase students' skills and cognitive abilities.

The impact of the sport education model in research on student perceptions is considered to be able to improve skills (7-16). Although research has shown improvement in students during learning, starting from a low level of student skills, it can increase. The results of this study indicate that sport education is very beneficial for students of lower skill levels. Through the sport education model, it allows a holistic and deeper understanding of student learning (knowledge and skills).

Based on our results and the results of previous research journal reviews, the authors can conclude that the sport education learning model can increase creativity, knowledge and skills to play big ball.

Limitations

The limitation of this research is a small research sample. Therefore, it is expected to be able to involve a large sample of more than one school in order to strengthen the generalization process of research related to the TGFU and sport education learning models. For researchers, it is also possible to further develop research with a wider scope. In this regard, this research can be used as a recommendation for further research.

Conclusions

This study proved that there is a significant positive effect of the TGFU learning model in PE on students to increase creativity, knowledge and skills in the big ball game. To achieve the desired learning objectives which consist of the affective, cognitive, and psychomotor domains, especially sports games, an appropriate model application is needed. We believe that by combining the TGFU and sport education models and paying attention to learning mechanisms and class organization will result in positive learning outcomes.

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