Effects of STAD and Jigsaw Cooperative Learning Methods on Badminton Backhand Low Service Skill

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This study is conducted to study the effects of STAD and Jigsaw cooperative learning methods on the learning of Badminton Backhand low service skill in secondary school Physical Education class for Form One pupils. This study uses quasi-experiment with intact sampling involving 2 experimental groups, namely STAD cooperative learning method (33 people) and Jigsaw (32 people) with one control group which is traditional teaching group (31 people). Experimental groups were taught using STAD cooperative learning method and Jigsaw which are teacher-centred, while the traditional teaching group was taught using the direct instructions method from a Physical Education teacher. Pre-tests are conducted in three groups before intervention programme is carried out. The intervention programme is carried out once a week for one hour in each learning session as provided in Secondary School Standard-Based Curriculum (KSSM). After conducting 4 sessions of intervention programme, post-test is carried out to collect data from three groups using different teaching and learning methods. One-way ANOVA is used to identify differences between groups whereas Paired Samples t-Test is used to identify differences between pre-test and post-test for each group in this study. Results show that STAD cooperative learning method and Jigsaw show better performances compared to control group in learning Backhand low service skill. In addition, STAD cooperative learning method and Jigsaw also show better improvements compared to the control group in learning Backhand low service skill in Form One Physical Education classes that use Secondary School Standard-Based Curriculum (KSSM).

Key words: *Cooperative Learning Method, STAD, Jigsaw, Badminton Backhand Low Service Skill.*

Introduction

Physical Education is a compulsory subject that should be studied in secondary schools. This is in line with the introduction of the Secondary School Standard-Based Curriculum (KSSM), which, in 2017, will replace the Secondary School Integrated Curriculum (KBSM) (KPM, 2016b). Support skills need to be given major emphasis in the teaching and learning of Physical Education and should be carried out based on the weight distribution of skills according to the Physical Education curriculum. This covers a total weightage of 75% for skills with time allocated for one hour in each Physical Education teaching and learning session that combine for two Physical Education periods on the relevant day (KPM, 2016b). Thus, Physical Education in secondary schools is an important subject that should be taught in fun and interesting ways to secondary school pupils during Physical Education class. This is so that they may acquire the skills they need to learn even if it is not examination subject (Ali, Som & Zahidi, 2016).

In relation to Form One Physical Education, Badminton sports skills are among the most important skills that need to be learned and acquired in Physical Education class (KPM, 2016a). Among the Badminton skills need to be learned, Badminton Backhand low service skill is the most important skill that pupils need to master before learning other Badminton skills in Form One Physical Education class (KPM, 2016a). In addition, Badminton Backhand low service skill is a skill that involves a wide range of sequences pupils need to master well during Physical Education class in order to execute the skill accurately (Edward, 1997). In order to ensure pupils will be able to master the learning of the Physical Education skills well, as stated in Secondary School Standard-Based Curriculum (KSSM), the selection of the methods in teaching and learning of Physical Education in school should be given attention and diversified (Salimin et al. 2015; Ali, Som & Zahidi, 2016; Eleanor et al. 2014; Trigwell & Prosser, 1996; Cruickshank et al. 2003; 2006) by Physical Education teachers in secondary schools. This is because methods used in teaching and learning will influence the effectiveness in achieving the teaching objectives of the skills in Physical Education class (Awang, 2012; Metzler, 2000; Mosston & Asworth, 2008).

Problem Statement

As mentioned before, teaching strategies in Physical Education is an area that needs to be given attention in order to achieve teaching objectives, that is, the acquisition of Physical Education skills (Ali, Som & Zahidi, 2016; Teng 2001; Wee 2002). Secondary school teachers are still using teacher-centred traditional teaching methods, which has created situations in Physical Education classrooms that are fully controlled by Physical Education teachers, and where pupils need to completely follow the teacher's instructions when learning skills (Salimin et al. 2015; Cruickshank, Jenkins & Metcalf, 2003; Garrett, 2008; Eleanor et al. 2014; Mosston &

Asworth, 2008; Lee, 2016). During skill learning, pupils only practise skills and movements facilitated by Physical Education teachers where the teachers will provide instructions and guidance to pupils (Salimin et al, 2015; Metzler, 2000; Ali, Som & Zahidi, 2016; Mosston & Asworth, 2008). Thus, delivery methods in traditional teaching are teacher-centred and involve one-way communication. This has always been used by Physical Education teachers when they have limited time to deliver the lesson content (Ali, Som & Zahidi, 2016; Eleanor et al. 2014; Chen & Hypnar, 2015). Therefore, learning in Physical Education class depends on explanations and demonstrations from teachers as the main source of information (Salimin et al. 2015; Mosston & Asworth, 2008; Metzler, 2000).

This results in pupils not being given opportunities to communicate with their teachers or classmates on the skills learned in traditional teaching methods (Salimin et al. 2015; Mosston & Asworth, 2008). One-way communication will lead to passive teaching and learning in Physical Education (Ali, Som & Zahidi, 2016). Thus, lack of feedback and one-way communication in learning Badminton Backhand low service skill in Physical Education classes that uses traditional teaching methods are insufficient to help novice pupils in learning Badminton Backhand low service skill correctly (Ten & Haridas, 1994). This is because pupils need guidance, feedback and assurance from their classmates or teachers on Badminton low service skill during practice in order to acquire the skill well during skill learning sessions (Ten & Haridas, 1994). In addition, traditional teaching methods which are teacher-centred also limit the pupils' active participation in Physical Education class when their learning is fully dependent on teacher instructions (Salimin et al, 2015; Metzler, 2000; Wee, 1998; Teng, 2001). Thus, pupils' participation, which is limited and less active in traditional teaching methods, cause the learning of Badminton Backhand low service skill to be less effective. This is because the learning of Badminton Backhand low service skill in Physical Education class requires active and ongoing participation from pupils to learn the skill (Ten & Haridas, 1994). As a result, pupils frequently make mistakes in Badminton low serve. Their Badminton Backhand low serve, for example, often fails at the net. As a consequence, the pupils struggle to score consistently in a match as this skill is required to start the match (Grice, 1996). Therefore, although the skill was taught during Physical Education class, pupils' achievements in mastering the skill are considered unsuccessful (Kirk & Macdonald, 1998) and unsatisfactory (Jani, 2000).

The use of a cooperative learning method which is student-centred has proven suitable for pupils in skill learning because cooperative learning methods can have positive learning effects. The presence of positive cooperation among pupils improves performances and helps achive the skill teaching objectives in Physical Education (Munafo, 2016; Goodyear, 2012). Among the learning structures of cooperative learning methods, the Student Teams-Achievement Divisions (STAD) cooperative learning method and Jigsaw cooperative learning method are suitable to be used in the teaching and learning of Physical Education in small groups (Metzler,

2000). This is because STAD and Jigsaw cooperative learning methods are identified methods that can increase the achievements and mastery levels of pupils as well as encourage pupils to actively collaborate in groups and work together as a team in learning (Metzler, 2000, Slavin, 1994). Therefore, the use of STAD and Jigsaw cooperative learning methods are able to enhance the achievement of teaching objectives through systematic learning in small groups and strong cooperation among group members to acquire the teaching objectives together (Slavin, 1995) through the implementation of elements such as communication skills, interpersonal skills, and teamwork skills. This is in order to share information and solve tasks together in group learning and support skill learning activities in small groups, improving achievements in skill learning (Casey, Goodyear & Dyson, 2015; Dyson, Linehan, & Hastie, 2010, Goodyear & Casey 2013; Dyson & Grineski 2001). In addition, cooperative learning methods also focus on the development of social skills, which will also enhance the willingness of pupils to help and provide feedback to their classmates and increase their ability to perform the skills learned correctly and accurately (Callado, Aranda & Pastor 2014; Lafont, Proeres, & Vallet, 2007; Goodyear, 2013, Dyson 2001).

Research Questions

This study aims to provide answers to the following research questions:
1) Are there any differences between the pre-test mean scores of the STAD cooperative learning group, the Jigsaw cooperative learning group, and the traditional teaching group in Badminton Backhand low service skill?
2) Are there any differences between pre-test and post-test mean scores of the STAD cooperative learning group, the Jigsaw cooperative learning group, and the traditional teaching group in Badminton Backhand low service skill?
3) Are there any differences between the post-test mean scores of the STAD cooperative learning group, the Jigsaw cooperative learning group, and the traditional teaching group in Badminton Backhand low service skill?

Literature Review
Methods of Use of Student Teams-Achievement Divisions (STAD) Cooperative Learning Method

The use of Student Teams-Achievement Divisions (STAD) cooperative learning method has improved the learning performances of the Volleyball Underhand service skill to a total of 66 secondary school pupils in Indonesia (Yudhianto & Hartati, 2013). Results of the data analysis from the pre-test and post-test of the experimental group and control group showed that STAD cooperative learning method managed to improve the achievements in learning Volleyball Underhand service skill for 14 to 15 years old secondary school pupils compared to the control group in the quantitative experimental design study.

In the learning of Football skills in Physical Education class, a study by Suroyo and Hartati (2014) found out that the experimental group (31 people) which used STAD cooperative learning method had positive effect when compared to the control group (31 people) in improving skill learning of Football shooting skill for 14 to 15 years old pupils in secondary school Physical Education class.

In the learning of Physical and Health Education class, Local Wisdom of Bali Model based on STAD cooperative learning method was found to be effective and practical in learning Physical Education, Sports and Health Education for 60 pupils aged between 13 and 14 years old (Yoda, 2017). The finding also showed that pupils' learning performances in Physical Education, Sports and Health Education had enhanced with improved knowledge and their teachers' understanding of STAD cooperative learning method.

In learning the dribbling skill in Football for secondary school pupils between 13 to 14 years old, the use of Student Teams-Achievement Divisions (STAD) showed improvement and had better learning achievements in learning Football dribbling skill compared to the control group (Setyo & Sudarso, 2017). Thus, STAD cooperative learning method showed positive learning impact in learning Football dribbling skill in Physical Education class.

In learning Football passing skill in Physical Education class, STAD cooperative learning method managed to improve the achievements and skills learning performances of Football passing skill for 10 years old primary school pupils in Physical Education class (Witiyasari & Muhammad, 2014).

Methods of Use of Jigsaw Cooperative Learning Method

In learning Volleyball skills, the Jigsaw cooperative learning method managed to improve performance in learning Volleyball Overhand service skill for secondary school pupils in Physical Education class (Prasetyo & Hidayat, 2015). Results obtained from a quantitative experimental design study in the pre and post tests have proved that the Jigsaw cooperative learning method is suitable to be used in learning skills for secondary school pupils from 17 to 18 years old.

Furthermore, Jigsaw cooperative learning method was also suitable to be used in learning Volleyball service skills for 13 to 14 years old pupils in Physical Education class in Indonesia (Subiantoro & Hidayat, 2013). This is because the Jigsaw cooperative learning method managed to improve the achievements of secondary school pupils in learning Volleyball service skills and form effective learning in Physical Education class to learn Volleyball service skills.

Meanwhile, the Jigsaw cooperative learning methods also helped to improve the achievements of secondary school pupils in the learning of the Basketball Chest Pass skill in Physical Education classes (Putra & Hartati, 2014). Data analysis from pre-test and post-test found out that Jigsaw cooperative learning method has improved achievements in learning Basketball Chest Pass skill for secondary school pupils aged from 13 to 14 years old in Indonesia.

Moreover, Jigsaw cooperative learning method was also used in learning theories and skills in Swimming for 55 university students. Analysis of research data proved that the students' learning achievements in the learning of Breaststroke and Butterfly swimming styles had improved in terms of theory, practice and skill implementation through the use of the Jigsaw cooperative learning method (Suwiwa, 2015). In addition, this method also encouraged student participation in learning Swimming skills. Therefore, Jigsaw cooperative learning method was proposed to be included for Swimming skills learning in Physical Education lectures.

In the learning of Gymnastics skills, Jigsaw learning method was used in learning Gymnastics skills during lectures where each student will be responsible for learning the Gymnastics skill provided (Bayraktar, 2011). Results of the study showed that Jigsaw cooperative learning methods were more effective when compared to traditional methods by giving positive learning effects and improving students' learning achievements, as well as their performance in mastering Gymnastics skills. Thus, the Jigsaw cooperative learning method is suitable to be used in learning Gymnastics in Turkey and to help university students to better acquire and perform Gymnastics skills.

Methodology
Methodology and Sampling Method

Quantitative research was carried out to obtain numerical data which can be used in data analysis to record the research results accurately (Fraenkel & Wallen 2009). Therefore, the research design chosen by the researcher for this study was quantitative quasi-experimental design involving pre-test and post-test due to constraints in making random distributions to choose respondents for the study (Palaniappan, 2009; Chua, 2006; 2014; 2009; Idris, 2010; Berg & Latin, 1994).

Therefore, the quasi-experimental method with intact sampling involving pupils in existing classrooms as research subjects can prevent this research from interrupting the teaching and learning of Physical Education in other classes in the selected secondary school (Berg & Latin, 1994, Chua, 2006).

Population of the study are Form One pupils aged 13 to 14 years old in the district of Kota Samarahan in Sarawak state registered under Ministry of Education Malaysia.

In this study, a random sampling technique was easily applied at Kota Samarahan district level to pick one school out of all the schools in Samarahan district. After the school for this study had been identified in the district, intact sampling technique was used together with school principal to determine the three Form One classes involved in this study. In this study, 33 pupils were in the STAD cooperative learning method experimental group, 32 pupils in the Jigsaw cooperative learning method experimental group and 31 in the traditional teaching group. Thus, the quasi-experimental method with intact sampling technique used pupils in existing classrooms as subjects to prevent this study from interrupting the teaching and learning of Physical Education in other classes in the selected secondary school (Berg & Latin, 1994, Chua, 2006).

Procedure of Action

Pre-test was used to measure Badminton Backhand low service skill among 96 Form One pupils prior to the implementation of learning sessions for the skill. Thus, pre-test was conducted to obtain information about the original condition of subjects (Chua, 2006). After that, pre-test scores were also compared with post-test results after the intervention programme was given (Chua, 2014). In this study, pre-test and post-test scores were used to determine effects of different learning methods on the skill learning performances in Physical Education class (Chua, 2009). Post-test, on the other hand, was conducted after the intervention programme was carried out to obtain information about the effects on the three groups of pupils in Physical Education classes (Chua, 2006). Therefore, post-test was used to measure achievements in learning Badminton Backhand low service skill after implementing the intervention programme for four weeks within one hour of each learning session which was carried out once a week.

Validity and Reliability

Instruments are important test tools in research. Instruments are used to measure what should be measured for the purpose of score interpretation in research (Idris, 2010) or to measure the data needed to be measured (Konting, 2009). Therefore, the validity and reliability of instruments were practiced in this study in order to make sure suitable instruments were used and were able to measure data that needed to be measured. Validity of the content of the instruments was suitable for quantitative research as content validity can indicate the extent to which the measurements made represent the content that should be measured in this quantitative research (Chua, 2009; 2014). In order to obtain the validity of the content for research instruments, reference and expert consent were obtained to make sure instruments

used in this study were valid and able to measure accurately the area or scope needed to be measured (Noraini, 2010). A pilot study was conducted to obtain the reliability of the instruments. Instruments showing high correlation between tests conducted repeatedly at different times have proven that instruments used were consistent and of high reliability (Fraenkel & Wallen, 2009; Neuman, 2011). The reliability value of the French Short-Serve Test instrument was 0.89 for Badminton Backhand low serve (Miller, 2010). However, a pilot test was also conducted in a secondary school in Asajaya district. Although the Asajaya district is not the real research area, it has a nearly similar background to Kota Samarahan district. A total of 30 pupils were identified as subjects of the study in the pilot study and obtained reliability value of 0.876 for French Short-Serve Test instrument in Badminton Backhand low serve. Thus, reliability value of French Short-Serve Test had reached 0.70 and indicated that the instrument was suitable to be used in this study.

Results
Homogeneity of Variances Test

Table 1: Levene's Test For Pre-Test in Badminton Backhand Low Service Skill

F	df1	df2	Sig.
1.676	2	93	0.193

Table 2: Levene's Test For Post-Test in Badminton Backhand Low Service Skill

F	df1	df2	Sig.
1.289	2	93	0.281

Based on Table 1 and Table 2, there were no significant difference shown in Levene's test for homogeneity of variances for pre-test and post-test on Badminton Backhand Low Service Skill with the significance values greater than 0.5. The data did not violate the homogeneity of variances assumption in this study.

Data Normality Test

Before the data from pre-test and post-test were analysed, skewness and kurtosis normality tests were used to examine if the data from pre-test and post-test of Badminton Backhand low service skill were normally distributed or not. Skewness and kurtosis normality tests were conducted on data collected from pre-test and post-test of Badminton Backhand low service skill and the results were as shown below:

Table 3: Skewness and Kurtosis Normality Test for Pre-test

Teaching and Learning Method	Skewness	Kurtosis
STAD	0.698	0.454
Jigsaw	0.185	-0.870
Traditional Teaching	0.363	-0.730

Table 4: Skewness and Kurtosis Normality Test for Post-test

Teaching and Learning Method	Skewness	Kurtosis
STAD	-.445	-.627
Jigsaw	.250	-.816
Traditional Teaching	.302	-.923

Based on Table 3, Skewness and Kurtosis normality values for the pre-test on Badminton Backhand low service skill for the STAD learning method group showed Skewness (0.698) and Kurtosis (0.454). Meanwhile, Skewness and Kurtosis values for the Jigsaw learning method group were 0.185 (Skewness) and -0.870 (Kurtosis) for the pre-test on Badminton Backhand low service skill. The Traditional teaching group showed Skewness (0.363) and Kurtosis (-0.730) for pre-test on Badminton Backhand low service skill in this study. Based on Table 4, Skewness and Kurtosis normality values for post-test on Badminton Backhand low serve skill for STAD learning method group showed Skewness (-0.445) and Kurtosis (-0.627). Meanwhile, Skewness and Kurtosis values for Jigsaw learning method group were 0.250 (Skewness) and -0.816 (Kurtosis) for post-test on Badminton Backhand low service skill. Traditional teaching group showed Skewness (0.302) and Kurtosis (-0.923) for post-test on Badminton Backhand low service skill in this study. Therefore, Skewness and Kurtosis values for three groups during pre-test and post-test on Badminton Backhand low service skill are normally distributed as the Skewness and Kurtosis range was between -2.00 and 2.00.

When the data was normally distributed and not violating the homogeneity of variances assumption, one-way ANOVA was used to compare the pre-test and post-test between three study groups while a Paired Samples t-test was used to compare pre-test and post-test for each group.

Answer to Research Question
Question 1: Is there any difference(s) between pre-test mean scores of the STAD cooperative learning group, the Jigsaw cooperative learning group and the traditional teaching group in Badminton Backhand low service skill?

Table 5: One-way ANOVA Test Results for Difference(s) between Pre-Test in Badminton Backhand Low Service Skill

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	293.130	2	146.565	2.325	.103
In Group	5861.859	93	63.031		
Total	6154.990	95			

Based on the comparison between pre-test mean scores in Badminton Backhand low service skill through analysis results from one-way ANOVA as shown in Table 5, there was no significant difference shown between the three groups ($F_{(2,93)}=2.325$, p=0.103), namely the STAD cooperative learning method group, the Jigsaw and traditional teaching group in pre-test on Badminton Backhand low service skill with $p>0.05$. Therefore, there was no significant difference among pupils from the three groups in Badminton Backhand low service skill before the skill learning was conducted during teaching and learning session in Physical Education class.

Question 2: Is there any difference(s) between pre-test and post-test mean scores of the STAD cooperative learning group, the Jigsaw cooperative learning group and the traditional teaching group in Badminton Backhand low service skill?

Table 6: T-Test Results for Repeated Measurement (Paired Samples T-Test) for Difference(s) between Pre-Test and Post-Test in Badminton Backhand Low Service Skill

Teaching Learning Method	Test	Standard Deviation	Mean	Mean Difference	t	Df	Sig. (2-tailed)
STAD	Pre-Test	7.981	18.15	-23.67	9.605	32	.000
	Post-Test	13.431	41.82				
Jigsaw	Pre-Test	6.643	17.44	-17.69	6.927	31	.000
	Post-Test	12.918	35.13				
Traditional Teaching	Pre-Test	9.048	21.48	-3.16	1.989	30	.056
	Post-Test	9.884	24.64				

According to t-test results for repeated measurements (Paired Samples T-Test) as shown in Table 6, there was a significant difference between pre-test (M=18.15, SD=7.981) and post-test (M=41.82, SD=13.431) mean scores in the STAD group with t(32)= 9.605, p<0.05 in Badminton Backhand low service skill. For the Jigsaw group, t-test results for repeated measurements (Paired Samples T-Test) also had showed significant difference between pre-test (M=17.44, SD=6.643) and post-test (M=35.13, SD=12.918) mean scores with t(31)= 6,927, p<0.05 in Badminton Backhand low service skill. However, t-test results for repeated measurements (Paired Samples T-Test) of traditional teaching group showed no significant

difference on pre-test (M=21.48, SD=9.048) and (M=24.65, SD=9.884) post-test mean scores in Badminton Backhand low service skill with t(30)= 1.989, p>0.05 as shown in Table 6.

Question 3: Is there any difference(s) between post-test mean scores of STAD cooperative learning group, Jigsaw cooperative learning group and traditional teaching group in Badminton Backhand low service skill?

Table 7: One-Way ANOVA Test Results for Difference(s) between Post-Test in Badminton Backhand Low Service Skill

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4770.327	2	2385.164	15.984	.000
In Group	13877.506	93	149.220		
Total	18647.833	95			

Based on the comparison between post-test mean scores in Badminton Backhand low service skill through analysis results from one-way ANOVA as shown in Table 5, there was a significant difference between the groups in this study, namely the STAD cooperative learning method group, the Jigsaw and traditional teaching in post-test (F(2,93)=15.984, p=0.000) on Badminton Backhand low service skill with a significant value of p<0.05 Therefore, there was significant difference among the study groups in this study after the intervention program on Badminton Backhand low service skill learning was conducted during teaching and learning session in Physical Education class to Form One pupils through data analysis from one-way ANOVA as shown in Table 7. Thus, Tukey Post-Hoc Comparison Test in one-way ANOVA was used to make comparisons between the groups to identify significant differences between the groups in this study.

Table 8: Turkey Post-Hoc Comparison Results in One-Way ANOVA for Difference(s) in Post-Test Mean Scores in Badminton Backhand Low Service Skill

Teaching and Learning Method		Mean Difference	Std. Error	Sig.
STAD	Jigsaw	6.69	3.03067	.075
	Traditional Teaching	17.17[*]	3.05539	.000
Jigsaw	STAD	-6.69	3.03067	.075
	Traditional Teaching	10.48[*]	3.07843	.003
Traditional Teaching	STAD	-17.17[*]	3.05539	.000
	Jigsaw	-10.48[*]	3.07843	.003

Based on Table 8, Tukey Post-Hoc Comparison Test in one-way ANOVA showed that there was a significant difference between post-test of traditional teaching group (M= 24.65,

SD=9.884) and post-test of STAD (M=41.82, SD=13.431) in Badminton Backhand low service skill. There was also significant difference between the post-test of the traditional teaching group (M= 24.65, SD=9.884) and the post-test of the Jigsaw group (M=35.13, SD=12.918) in Badminton Backhand low service skill achievement. However, there was no significant difference between post-test of STAD group (M=41.82, SD=13.431) and post-test of Jigsaw group (M=35.13, SD=12.918) in Badminton Backhand low service skill.

Discussion and Conclusion

Results of the data analysis using Paired Samples t-Test have proven that there is a significant increase in improving achievements of Badminton Backhand low service skill [t(32)=9.605, p<0.05] based on the comparisons between pre-test and post-test of the skill in the STAD cooperative learning method group when compared to the traditional teaching group, which showed no significant difference for pre-test and post-test mean scores in Badminton Backhand low service skill [t(30)= -1.989, p>0.05]。 This result is in line with studies by Yudhianto and Hartati (2013), Suroyo and Hartati (2014) which also proved that STAD cooperative learning method managed to improve learning achievement on sports skills learned for 14 to 15 years old secondary school pupils in Physical Education class.

In one-way ANOVA analysis for post-test, STAD cooperative learning method shows significant difference with traditional teaching method in learning Backhand low service skill. Tukey Post-Hoc Comparison Test in One-way ANOVA shows that there is a significant difference between post-test of traditional teaching group and post-test of STAD group (p=0.000) in Backhand low service skill. This result indicates that STAD cooperative learning method has positive impact to improve Backhand low serve skill achievement in Form One Physical Education class. This result is in line with studies by Study conducted by Yoda (2017) also showed that STAD cooperative learning method is suitable to be used in learning Physical Education, Sports and Health Education. In addition, STAD cooperative learning method has also been found to enhance learning performances in Football dribbling skills for secondary school pupils from 13 to 14 years old (Setyo & Sudarso, 2017) and managed to improve achievement and learning performances in Football passing skills for 10 years old pupils in primary school Physical Education classes.

Moreover, this study also finds that the Jigsaw cooperative learning method shows a significant increase in the pre-test and post-test on Backhand low serve skill [t(31)= -6.927, p<0.05] using Paired Samples t-Test when compared to the traditional teaching group, which shows no significant difference in pre-test and post-test on Backhand low service skill [t(30)= -1.989, p>0.05]. Result of this study also supported by Subiantoro and Hidayat (2013) showed that the Jigsaw cooperative learning method works effectively in Physical Education class to learn Volleyball service skill and improve learning performance of Basketball Chest Pass skill in

Physical Education class (Putra & Hartati, 2014) for secondary school pupils aged 13 to 14 years old in Indonesia.

In addition, analysis of the one-way ANOVA also shows that the Jigsaw cooperative learning method has achieved better post-test achievement and is significantly different from the traditional teaching method in learning Backhand low serve. Tukey Post-Hoc Comparison Test in one-way ANOVA has showed that there is significant difference between post-tests of both the traditional teaching group and the Jigsaw group (p=0.003) on Badminton Backhand and Forehand low service skill. The results of this study show that Jigsaw cooperative learning method also has a positive effect in improving achievement in learning Backhand low service skill in Form One Physical Education class. This result is in line with the research of Prasetyo and Hidayat (2015) who also demonstrated that the use of the Jigsaw cooperative learning method in Physical Education class positively affects the learning of Volleyball skills for secondary school pupils in Physical Education class. The results of this study are also in line with the study of Suwiwa (2015) who showed that the Jigsaw cooperative learning method had improved the learning of Swimming skills for university students in Indonesia and was suitable for improving learning performances among university pupils in Turkey in acquiring Gymnastics skills.

On the other hand, analysis of one-way ANOVA in the post-test also indicates that there is no significant difference among post-tests of STAD group and Jigsaw group (p=0.075) in Badminton Backhand low service skill. Thus, both cooperative learning methods are equivalent, suitable and are suggested as alternative methods in teaching and learning of skills for pupils in secondary school. This is because STAD cooperative learning method and Jigsaw cooperative learning method are able to provide different experiences for Form One pupils in secondary schools to learn sports skills in Physical Education class. The direct experiences and involvement of pupils in skill learning through STAD and Jigsaw cooperative learning methods have helped pupils to develop a deeper understanding of the skills learned and further improve their achievements in secondary school Physical Education class. Therefore, both cooperative learning methods are suitable to be applied in the new learning structure of Physical Education in secondary schools through the introduction of Secondary School Standard-Based Curriculum (KSSM).

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