

The Effectiveness of ‘Student Team Achievement Divisions’ (STAD) Model towards Students’ Achievement in the Principles of Accounting Subject

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Abstract

The purpose of this study was to determine the effectiveness of the STAD model towards students’ achievement in the Principles of Accounting subject, specifically in the Ledger topics. This study also evaluated students’ understanding, motivation, attitude and interest in learning Principles of Accounting after using the STAD model. A quantitative approach with a quasi-experimental design was used. The sample selection involved Form 4 students from the social science stream comprising 30 students in the treatment group and 30 students in the control group. The research instruments used were pre-test, post-test and a survey questionnaire. The data was analyzed using the descriptive and inferential analysis. The descriptive analysis was used to describe students’ perceptions of learning Principles of Accounting after using the STAD model. The inferential analysis involved analysis such as independent sample t-tests, paired sample t-tests and Pearson correlation analysis to explain the differences and relationships between the variables of the study. The findings showed that there was a significant difference between the treatment group and the control group in the post-test whereby the treatment group showed a significant and higher improvement (mean score= 18.267) compared to the control group (mean score= 15.133). The Pearson correlation analysis also showed a strong relationship ($r= 0.745$) between the STAD model and student achievement in post-test analysis. The results of the students’ perceptions of Principles of Accounting after using the STAD model showed that their levels of understanding and motivation were high. The findings of this study showed that the STAD model improved students’ achievement, understanding and motivation in Principles of Accounting subject. The implications of this study indicated that the STAD model could enhance the learning effectiveness of Principles of Accounting.

Keywords:

‘STAD’, achievements, Principles of Accounting, accounting education, innovation

INTRODUCTION

The educational role of the Principles of Accounting subject could be viewed in the context of fulfilling the nation’s aspirations via the Eleventh Malaysian Plan (RMK-11) which was during the period of 2016 to 2020. There were 6 strategic thrusts presented by the Prime Minister at that time, Dato’ Seri Najib Tun Razak, with the aim of engineering the economic growth for the improvement of prosperity (Utusan, Mei 2015). As such, it can be seen here that the entrepreneurial field is an important element in creating a community with economic competitiveness as it assists in the economic growth in terms of providing productivity and job opportunities. A vital feature for successful entrepreneurs is to have knowledge and skills in

accounting. As such, a curriculum in Principles of Accounting should be properly designed to provide skillful workforce in the entrepreneurial field.

Dokumen Standard Kurikulum dan Pentaksiran (DSKP) (Kementerian Pendidikan Malaysia, 2016) also describes that one of the aims of KSSM is to produce students with 21st century skills by focusing on thinking skills, living skills and a career which is based on positive moral values. The 21st century skills are utilised to further develop students with qualities such as resilience, communication skills, thinking skills and teamwork skills. This clearly shows that active learning which requires students' involvement is one type of learning which is able to cultivate students with 21st century skills.

As such, the aspect to be focused in this study would cover the active learning strategy by using the '*Student Team Achievement Divisions*' (STAD) model. Previous studies proposed the application of gallery walk (Makmun, Yin, & Zakariya, 2020), competition-based learning (Joseph & Rahmat, 2019; Radzi, Drahman, Joseph, Rahmat, & Suria, 2020) to improve students' learning in Accounting class. However, the STAD model is seen as useful for cultivating students' attitude and motivation in teamwork as well as encouraging them to work effectively and in harmony with others. This has been described in the DSKP Prinsip Perakaunan in the teamwork feature whereby the students could handle responsibilities together as well as appreciate the contribution given by each team member (Kementerian Pendidikan Malaysia, 2016). Additionally, they could also acquire interpersonal skills through the collaborative activity; this could help to make them good leaders and team members.

To fulfil the aims in DSKP Principles of Accounting, a new approach which differs from the traditional approach should be utilised such as the STAD learning model in the above-mentioned subject. As such, this study was conducted on secondary school students in an urban school to assess the effectiveness of the STAD learning model as an active learning strategy in the effort to increase students' achievement in the Principles of Account subject. The study objectives were to identify if there were any differences in the students' achievement level for the treatment group and the control group in the pre-test and post-test as well as to identify the relationship between the STAD model with the students' post-test scores. Additionally, the study was conducted to identify the students' perception towards the Principles of Accounting subject after undergoing the STAD learning model.

LITERATURE REVIEW

The Edgar Dale learning cone

The active learning approach is further explained in Dale's study (1969) as the Edgar Dale learning cone. Based on Figure 1, it can be concluded that the students would not get much input if they only saw or heard what was being taught by the teacher in the classroom. They would probably learn more if they talked about what they had learnt and wrote down what they had understood, related the previous lesson with their current experience as well as practised what they learnt in their daily lives. This is vital in order to shift the students from rote-learning to the process of actually understanding the lesson. As such, teachers should plan the lesson in class by applying the active learning strategy in the class activities so that the learning produced would be more effective and meaningful. Therefore, via this theory, the active learning strategy assists students in remembering the knowledge learnt as well as having the opportunity to participate in the teacher-planned activity.

Thus, in order to develop effective learning, the teacher should utilise the group discussion strategy (Wan Hasmah dan Nur Munirah (2015)). The students will then be able to state their views, start a discussion with their friends as well as show their talents and abilities in doing a particular task. Additionally, the students can also help one another by sharing their knowledge and they are also able to learn from their friends. Some students are more open towards the process of asking their friends about particular issues compared to their teachers. This is supported by Ishtiaq, Zuraina and Salem (2017); they found that students felt more comfortable if they discussed with their team members first before they discussed with their friends. In this way, the students could improve their level of understanding and mastery of a topic learnt.

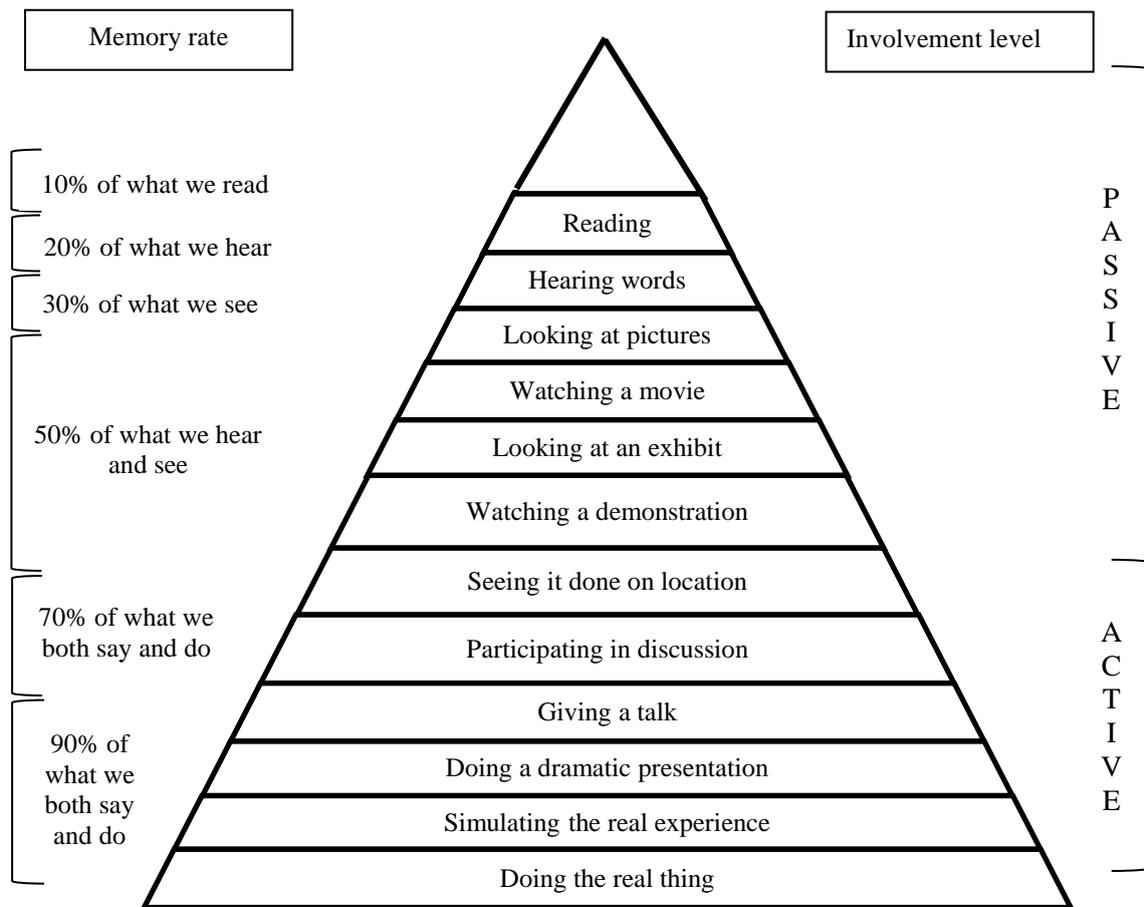


Figure 1: Edgar Dale's Learning Cone (1969)

The STAD learning model as an active learning strategy

In the beginning, Slavin (1978) introduced the STAD model. Since then, it has been used in many fields such as mathematics, linguistics, arts, sociology and science (Karaçöp, 2016). The STAD model is defined as an effective learning method in the classroom where the students undergo the learning activity in a team and gain rewards and recognition based on their team scores (Slavin, 1980).

According to Slavin (1995), STAD is a group-based learning method and each group is made up of 4 or students who are heterogenous in terms of academic achievement, gender, race, or ethnic group. A heterogeneous group is required in order to form intellectual diversity

as the students would be exposed to ways on how to solve an issue with various alternatives, how to present ideas in a more effective way, how to provide justification on one's views and how to explore issues from different perspectives (Cohen & Lotan, 1997). In fact, via the STAD learning model, the students have to cooperate in order to improve the quiz scores; each group member should be responsible in the overall team achievement so that they could become the best team with the best scores (Kim, 2018).

The main objective of the STAD model is to improve and to upgrade students' achievement. The main ideas as stated by Slavin (2003) are to motivate the students to encourage and assist one another in the core skills as presented by the teacher. The STAD model has also been studied and has been assessed in terms of academic achievement, attitude, social interaction, and interpersonal relationship (Bernaus & Gardner, 2008).

Tiantong and Teemuangsai (2013) stated that there were a few steps in the teaching and learning of the STAD model:

- i. Step 1: The teacher presents the lesson content.
- ii. Step 2: Students work together in a team and make sure that all team members can master the lesson content.
- iii. Step 3: Each member should take the individual quiz and they are not allowed to help one another. This is to ensure that each team member is responsible for learning the lesson content.
- iv. Step 4: Each quiz mark is compared with the previous average achievement and marks will be given based on how much the student has fulfilled or exceeded his/her previous achievement. When the team member shows some improvement in their quiz, then the overall group achievement increases.
- v. Step 5: The marks for each group is totalled up to form a network of teams as shown in Figure 2. The team which fulfil certain criteria can get rewards or recognition from the teacher.

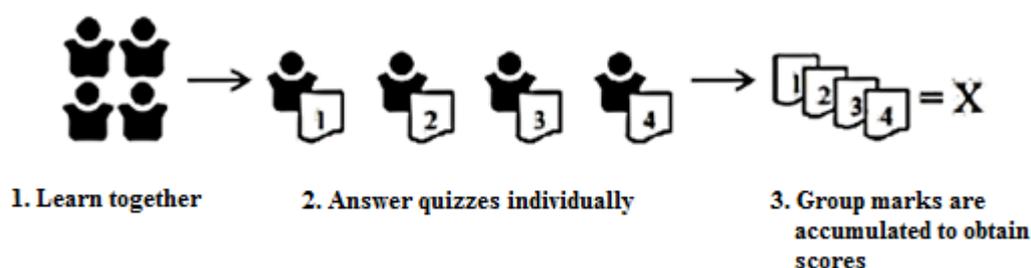


Figure 2: Method of implementing the STAD model (Tiantong & Teemuangsai, 2013) adapted from Slavin (2005)

The group discussion method which includes the cooperative method involves some of the activities in active learning. According to Kim (2018), cooperative learning is a process in active learning as the students tend to create and share knowledge more in groups. As such, the typical cooperative learning used is the STAD model as it is a method which solves problems in groups and it encourages students to study actively (Sukma, 2013). According to Wan Hasmah and Nur Munirah (2015), one of the features of active learning is that the students study in groups. Therefore, the STAD model was chosen as a strategy in implementing active learning based on the active learning features and processes stated.

Additionally, Ariyani (2016) described the STAD model as the easiest type of

cooperative learning and it has been the focus of the teaching of various subjects and grades. The usage of the STAD model has helped to cultivate students who are more responsible for the achievement of their groups as well as their own achievements. This responsible behaviour has helped to create a positive attitude in appreciating others' views as well as appreciating the students' work which show different achievement levels; apart from creating an active learning environment (Rozita, Latifah & Fadzilah, 2017). Deswarni (2018) also stated that the STAD model was the easiest cooperative method utilised compared to other cooperative methods and it is suitable for teachers who would like to try out the cooperative method in teaching.

Previous findings showed that the STAD model was one of the effective methods in increasing the students' academic achievement and it helped in providing a positive effect towards the students' attitude and perception of learning (Kriswintari, Yuanita & Widodo, 2018; Saifulnizam & Faridah, 2017; Ahmad, 2013; Slavin, 1990). Additionally, the STAD model is seen as helping in cultivating students' attitude and spirit in teamwork as well as enabling them to work effectively and in harmony with others. This has been described in the context of DSKP Principles of Accounting via the teamwork feature in which the students handle responsibility together and respect and appreciate the contribution given by each team member (Kementerian Pendidikan Malaysia, 2016). From this description, it clearly shows that the usage of STAD model in principles of Accounting is vital to fulfil the requirements targeted in DSKP Principles of Accounting. As such, this study is important to ensure the effectiveness of the STAD learning model on students' achievement in the Principles of Accounting subject as well as to create a positive perception among the students towards subject.

METHODOLOGY

Table 1 shows the research design utilised in this study (quasi-experimental) in which the pre-test and post-test were used as the instruments to assess students' achievement level. Cook and Campbell (1979) described that the quasi-experimental design does not involve random sampling. The type of quasi-experimental study utilised here was the '*nonequivalent groups pre-post tests design*' (Wiersma & Jurs, 2009). This research design is utilised when there is a need to assess the effectiveness of a teaching method, module, or programme especially when it concerns situations at school (Newman, 1991).

Based on Table 1, the independent variable was the STAD model (treatment) and the traditional method (without treatment) while the dependent variable was the achievement level for both student groups. The sample involved was 60 students with 30 students in the treatment group and 30 students in the control group. The students involved in the study were in their assigned class known as the 'intact group' and they shared a few similarities such as age, the chosen stream, and their achievement. If random sampling was not chosen, then the intact group was the most suitable group to be used in the quasi-experimental study (Cook & Campbell, 1979).

Table 1: Pre-test post-test design for non-equivalent groups

Group	Number	Pre-test	Treatment	Questionnaire	Post-test
Control	30	T1	-	-	T2
Treatment	30	T1	X1	Q1	T2

Source : Chua (2006)

Indication:
 T1- Pre-test
 X1- Treatment
 Q1- Questionnaire

T2-Post-test

This study was conducted in the existing class. The pre-test was given to the two groups at the same time. Next, the STAD learning model was conducted by the Principles of Accounting teacher for 4 weeks on the treatment group. Meanwhile, the control group received the traditional learning during the treatment period. After the treatment period, the two groups were given the post-test at the same time. The increase of scores for both groups was assessed by making a comparison of marks between the pre-test and post-test. Then the questionnaire was given to the treatment group to assess the members' perception about the learning of Principles of Accounting after being given exposure of the STAD model. The duration for the study was 6 weeks.

However, Cook dan Campbell (1979) had identified a few threats in the quasi-experimental study such as the external or extraneous variable which were involved in this study such as the sample selection, the people involved in giving treatment, the duration of study, the preparation of questions and teachers' teaching styles. The extraneous variables affect or influence the dependent variables and independent variables if they are not controlled as well as increase the likelihood of errors in the study. As such, threats such as the extraneous variables should be identified to control the extraneous effects from occurring.

The rationale for the selection of schools was made based on the school characteristics. The school under study had similarities in terms of the classes which offered the Principles of Accounting subject with three Form 4 classes taking the subject. This is vital to control the external variables or the extraneous factors from occurring as the three classes (including the class involved in the pilot study) were at a similar location.

The study instruments utilised were the pre-test, post-test, and questionnaires. The pre-test was conducted to obtain an initial description of the information relating to achievement, skills, and basic knowledge of the study sample. The post test was used after the study sample had undergone the treatment or the STAD learning model for the treatment group or the traditional learning method for the control group. Both the test questions and answer scheme were based on the Ledger topic in the Form 4 syllabus of the Principles of Accounting subject. To ensure the validity and reliability of the questions, the test questions and the answer scheme were checked and verified by the Principles of Accounting teacher in the school under study.

To answer questions related to students' understanding, motivation, attitude and interest towards the learning of Principles of Accounting after the implementation of the model, questionnaires were distributed to the students in the treatment group after they had undergone the STAD learning model. A total of 33 items were prepared in the questionnaire and they were measured using the 4-point Likert scale. The validity of the questionnaire items was measured in terms of accuracy of construct usage, clarity of items' meaning, suitability of language used, clarity of direction given, indication of the scale measured as well as sentence structure and spelling. The questionnaire reliability was also tested by the implementation of the pilot study whereby the Cronbach Alpha value acquired (0.943) showed that the reliability was at the best level.

RESEARCH FINDINGS

Respondent demographics

Table 2 shows the number and percentage of respondents according to gender. There were 22 male respondents (36.7%) and 38 female respondents (63.3%). As such, we can ascertain that most respondents were females compared to males with a difference of 16 respondents (26.67%).

Table 2: The distribution of respondents according to gender

Gender	Frequency	Percentage (%)
Male	22	36.7
Female	38	63.3
Total	60	100.0

Table 3 shows the number and percentage of respondents according to class. A total of 60 students had been used for this study with 30 students from the treatment group and 30 students from the control group.

Table 3: Distribution of respondents according to class

Class	Frequency	Percentage (%)
Treatment group	30	50.0
Control group	30	50.0
Total	60	100.0

Table 4 shows the number and percentage of respondents according to ethnic group. The respondents comprised of 17 Malay students (28.3%), 38 Chinese students (63.3%) and 5 Indian students (8.3%). As such, in terms of racial distribution, we can see that most of the students are Chinese.

Table 4: Distribution of respondents according to ethnic group

Ethnic group	Frequency	Percentage (%)
Melayu	17	28.3
Cina	38	63.3
India	5	8.3
Total	60	100.0

Difference in students' achievement in Principles of Account subject between the control group and the treatment group in the pre-test

Table 5 shows the pre-test mean scores for the treatment group (mean=15.217, sp= 2.116) while the pre- test mean scores for the control group was (mean= 14.883, sp= 1.897). This showed that the pre-test mean scores for the treatment group and the control group were at moderate level (scores between 11 to 15). The independent t-test results showed that the t-value $t(58) = 0.642$, while the p value = $0.523 > \alpha 0.001$. This meant that hypothesis H_{01} was rejected; this indicated that there was no significant difference in terms of students' achievement level in the Principles of Accounting subject for both groups in the pre-test. The findings are vital to show that there was no difference in terms of the initial knowledge of the two groups in the Ledger topic. It was important for both groups to have the same level of knowledge so that this would

not affect the study findings.

Table 5: Analysis of independent t-test regarding students' achievement in Principles of Accounting subject between the control group and the treatment group in the pre-test

Pre-test scores	Mean	Standard deviation	t	df	Significant
Treatment group	15.217	2.116	0.642	58	0.523
Control group	14.883	1.897			

*Significant p value < 0.001

Difference in students' achievement level in Principles of Accounting subject between the control group and treatment group in the post-test

The post-test was conducted after the treatment group had their STAD learning model and the control group had their traditional learning. Table 6 shows the post-test mean scores for the treatment group (mean= 18.267, sp= 1.209) while the post-test mean scores for the control group was (mean= 15.133, sp= 1.613). This showed that the post-test scores for the treatment group was at a good level (score between 16 to 20) while the treatment group was at a moderate level (score between 11 to 15). The independent t-test analysis showed that the t value was t (58)= 8.514 and the p value = 0.000 < α 0.001. This meant that hypothesis H_{02} was rejected and this indicated that there was a significant difference between the students' achievement for both groups in the post-test. The higher mean score increase in the post-test could be seen in the treatment group compared to the control group.

Table 6: Analysis of the independent t-test regarding the students' achievement level in the Principles of Accounting subject between the control group and the treatment group in the post-test

Post-test scores	Mean	Standard deviation	df	t	P
Treatment group	18.2667	1.20869	58	8.514	0.000
Control group	15.1333	1.61316			

*Significant p value < 0.05

Difference in achievement of pre-test and post-test scores for the treatment group

Table 7 shows that the students' mean scores had increased some 3.050 points from 15.216 in the pre-test to 18.267 in the post-test. The findings showed that the students' achievement increased from moderate (mean score from 11 to 15) to good (mean score between 16 to 20). The independent t-test analysis revealed the t value t (29)= - 13.771, p value = 0.000 < α 0.001. This meant that the hypothesis H_{03} was rejected and this showed that there was a significant difference between the achievement scores in the pre-test and post-test for the treatment group.

Table 7: The analysis of paired t-test for the pre-test and post-test scores for the treatment group

Treatment group	Mean	Standard deviation	df	t	P
Pre-test	15.2167	2.11596	29	-13.771	0.000
Post-test	18.2667	1.20869			

*Significant p value < 0.05

Difference in achievement for pre-test scores and post-test scores for the control group

Table 8 shows that the mean scores for students' achievement increased some 0.250 points from 14.883 in the pre-test to 15.133 in the post-test. The findings showed that the achievement of the control group remained at a moderate level (mean scores between 11 to 15). The independent t-test scores found that the $t(29) = -1.542$, while the p value = $0.134 > \alpha 0.001$. This meant that the H_{04} hypothesis failed to be rejected; this indicated that there was no significant difference between the achievement scores in the pre-test and post-test for the control group. The increase in the control group mean scores of 0.250 was not big enough if we compared it with the treatment group achievement with an increase of 3.050.

Table 8: Analysis of paired t-tests for the control group pre-test and post-test

Control group	Mean	Standard deviation	df	t	P
Pre-test	14.8833	1.89684	29	-1.542	0.134
Post-test	15.1333	1.61316			

*Significant p value < 0.05

Relationship between the STAD learning model with students' achievement in the post-test

One of the study objectives was to ascertain the relationship between the STAD learning model with the control group's achievement in the post-test. Table 9 shows that there was a positive relationship between the two variables ($r = 0.745$). This indicated that there was a significant relationship between the STAD model with students' achievement in the post-test where $r = 0.745$, $p = 0.000 < \alpha 0.001$. This meant that hypothesis H_{05} was rejected. There was a strong relationship between the two variables as the correlational coefficient value, $r = 0.745$ was between 0.60 to 0.79.

Table 9: Analysis of Pearson's correlation between the STAD learning model variables and students' post-test achievement scores

	Intervention	Post-test scores
Intervention	Pearson's correlation	.745(**)
	Sig. (1-tailed)	.000
	N	60

** Correlation is significant at 0.001 level (1-tailed)

Students' perception of the Principles of Accounting subject after undergoing the STAD learning model

An assessment of the treatment group's perception of the Principles of Accounting subject could be measured in terms of their understanding, motivation, attitude, and interest. Based on Table 10, the treatment group's understanding, and motivation towards the subject as shown by the mean scores appeared to be at a high level. The students' perception in terms of attitude and interest as shown by the mean scores appeared to be at a moderate level.

Table 10: The treatment group's perception of the STAD learning model

Aspect to be measured	Mean	Standard Deviation	Level
Understanding	3.04	0.611	High
Motivation	3.14	0.222	High
Attitude	2.86	0.433	Moderate
Interest	2.90	0.510	Moderate

DISCUSSION

There are various strategies which could be practised in line with 21st century learning. In fact, the KPM had realised the aim of cultivating students with 21st century skills via the KSSM. Some of the 21st century learning features focused in this study was the teamwork aspect as this aspect had been described in the aims of the DSKP Principles of Accounting. Thus, the active learning which requires student involvement such as the STAD model is one of the learning methods which can contribute towards cultivating students who fulfil the 21st century learning characteristics.

The STAD learning model appeared to assist the students in the Principles of Accounting subject especially in topics which require a high understanding of concepts such as the preparation of the financial statement. The teacher could diversify the teaching methods by using an active learning approach for other topics in the subject. This effort would indirectly help the students in solving the problems which they face in learning the subject with their friends. As such, this enables the students to understand the concepts and format of the Principles of Accounting subject better as well as making the connection between the subject and real life.

The study findings showed the real picture of students' achievement in Principles of Accounting after going through the STAD learning model. The students improved in their achievement after going through the treatment; this indicated that this strategy could increase students' achievement from average to good. The students' improved achievement was in line with the findings from Saifulnizam and Faridah (2017) where the usage of the STAD model in the *Cost Management Accounting 2* course increased students' achievement from moderate to excellent. These findings also supported the findings from Ugwu (2019) and Inkeeree, Fauzee and Othman (2018) which all showed significant improvement in the post-test scores after the students went through the STAD learning model. Therefore, these students need to involve themselves in the new learning strategy utilised by the teacher. This indirectly would help them to study with a more effective learning method compared to the existing learning method and attract the students' attention towards the Principles of Accounting subject.

Additionally, the study findings showed that the students' understanding and motivation level towards the Principles of Accounting subject after following the STAD learning model was at a high level. This was in line with the findings from Saifulnizam and Faridah (2017) where 76% of the students agreed that the STAD learning model helped them in understanding the content of the variance topic in the *Cost Management Accounting 2* course. Wong (2017) also stated that the STAD model showed an active pedagogical strategy in improving students' understanding. In terms of motivation, the results were in line with the findings from Jamaludin and Mokhtar (2018) where the students appeared to be more focused and motivated as their roles in the groups had been recognised by their peers. Kriswintari, Yuanita and Widodo (2018) also found that the students were motivated and spirited in their

Chemistry learning after following the STAD learning model. These findings showed that besides improving the achievement, this strategy could also improve students' understanding and motivation towards the Principles of Accounting subject. This is vital to ensure that the students know and understand the basics of accounting while in Form 4 as a preparation before they face the SPM exams in the following year.

However, it was found that the perception of students in terms of their attitude and interest in Principles of Accounting was at a medium level. Nengah and Dewa (2018) stated that students felt confused and ashamed to share their ideas with the current group during the discussion. Based on the observation conducted, there was not much in terms of the students' responses during the first meeting as they were still shy and felt uncomfortable with the new method being introduced to them (Daharia, 2016). Nengah and Dewa (2018) stated that students with low achievement in the post-test appeared to be not very active and did not show interest in the group discussion.

As such, the parties involved especially the teacher could diversify their active learning besides using the STAD model to attract students' attention as well as to develop students' positive attitude towards the Principles of Accounting subject. A positive attitude could be inculcated as the team members help one another in improving the team's achievement, give recognition to one another and showing a positive behaviour in learning (Ahmad, 2013). Therefore, to ensure that the objectives in active learning are achieved, teachers should play their role as the facilitator (Halim dan Muhibah, 2015). Teachers should be alert towards the approach which they want to utilise to create effective and meaningful learning. For example, the STAD model can attract the students' interest as well as providing motivation to the students so that they are more competitive (Slavin, 1995).

It is hoped that this study would provide meaningful impact for teachers, administrators and KPM officers in planning the best strategy for our education system. This study would be useful for inculcating active learning activities especially the STAD model in the Principles of Accounting curriculum; in fact it could be expanded for other subjects. This is because the STAD learning model not only can improve students' achievement but it can also influence students' understanding and motivation of what they learnt.

CONCLUSION

The findings appeared to provide positive implications on current educational development as STAD emphasises the teamwork feature. The results showed that the STAD model was an effective active learning strategy for improving students' achievement in Principles of Accounting. However, the study only focused on Form 4 students in a school in the Petaling Jaya district. The pre-test and the post-test also focused on only one topic which was Ledger. As such, the study could be widened by involving a bigger sample such as a few schools in the urban and suburban areas. Additionally, the topics tested in the pre-test and the post-test could be widened to more difficult topics in Principles of Accounting such as the preparation of the financial statement. However, it is hoped that this study could help certain parties especially the teachers in planning an effective teaching strategy in Principles of Accounting in order to improve students' achievement to a better level.

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