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Implementing Slavin's Students Team-achievement Divisions (STAD) on Second Years at the Department of Letters and English,University of Constantine 01

Abstract :

As iron sharpens iron, so one person sharpens another", goes the proverb. It perfectly explains the essence of cooperative learning, the approach that turns the classroom to a workshop of learning in which 'learners sharpen learners'. The power of human beings as social creatures allows students to learn from each other academic content through team work. The aim of this article is to demonstrate that such type of learning truly enhances learners writing achievement. We tried to investigate the efficacy of the STAD, a cooperative learning/instructional method, in boosting learners' writing skill. We first provided a description of the STAD method as put by Slavin (1995) and, then we uncovered the extent to which we adapted it to fit the research requirements. The results of the experiment carried out on a sample of second years report that cooperative learning is to some extent successful in promoting academic achievement.

Nora BOUDEHANE
Faculty of Letters and Languages
Department of Letters and English
University Constantine 01

Résumé :

Comme le fer aiguise le fer, ainsi un homme aiguise un autre", dit le proverbe. Il explique parfaitement l'essence de l'apprentissage coopératif, l'approche qui transforme la salle de classe à un atelier d'apprentissage dans lequel les «apprenants aiguisent apprenants. La puissance des êtres humains comme des créatures sociales permet aux étudiants d'apprendre les uns des autres contenus académiques grâce à un travail d'équipe. Le but de cet article est de démontrer que ce type d'apprentissage améliore réellement la rédaction chez les apprenants. Nous avons essayé d'étudier l'efficacité de la méthode STAD, soit un apprentissage/enseignement coopératif méthode, dans la stimulation de de la compétence de rédaction. Nous avons d'abord présenté la méthode STAD telle que posée par Slavin (1995) et comment elle a été adaptée pour répondre aux exigences de la recherche. Les résultats de l'expérience menée sur un échantillon d'étudiants de deuxième année indiquent que l'apprentissage coopératif a dans une certaine mesure réussi à promouvoir la réussite scolaire.

Introduction :

Writing is one of the most heavily researched areas of education. Learning to write in a foreign language is a demanding task, and for teaching and learning to take place, great efforts should be made on the teachers' and the students' parts. As foreign language teachers,

the need to find an effectual way to teach the writing skill makes us think of an approach that, not only gets students participate actively, but also helps them develop a sense of learning responsibility, autonomy and collaboration, namely the *Cooperative/Collaborative Learning Approach*. It is a currently emerged approach that involves a structured group of learners working together toward a shared goal (Farmer, 1999). In a collaborative work, students are asked to actively participate, interact, explain and socialize. Cooperative learning, in effect, is more than getting students to work in groups (Williams, 2007); learners have to apply a variety of techniques to deal with each other and solve problems in a team to accomplish the task. Everyone should take over and use the different skills to create a comfortable context to communicate freely and openly with each other (Agarwal & Nagar, 2011).

Slavin (1995) contends that cooperative learning is an efficient instructional technique for a variety of learners in a variety of situations. He suggested the *Students' Team Learning Methods* which are cooperative learning techniques developed at Johns Hopkins University. Five major *Students Team Learning methods* have been developed and heavily researched. Three are general cooperative learning methods adjustable to most modules and grade levels; one of these methods is *Students' Team-Achievement Divisions* (STAD).

1. Description of Slavin's STAD (1995)

The idea of the STAD is to motivate learners help and embolden each other understand the lesson presented earlier by the teacher. The system of this method encourages team members do well in both the collaborative and the individual works. STAD consists of five main components: class presentation, teams, quizzes, individual improvement and team recognition.

STAD Components	Description
1- Class presentation	The teacher first introduces the lesson to students before they start cooperating.
2-Teams	Students start to work in groups on the task to accomplish the shared goal.
3-Quizzes	Students take individual quizzes. Learners are not allowed to assist each other during the test.
4-Individual improvement	Individual improvement scores are gained to see whether students have improved according to their past performance and how much they have improved.
5-Team recognition	Groups may win certificates or other kind of rewards if their averages of improvement scores exceed a certain level.

2. Design of the Experiment: How Much Adapting the STAD

For some considerations, we have adapted the STAD. That is, it is adapted according to the skill we are teaching (*Written Expression*), the level of our students (*university students*) and according to our system of scoring (out of *20/20* not out of *100*). Yet, we have included all the five STAD components. However, the way they are organized and applied is not the same; we have joined two components to be one: *team work and the quiz*, we have changed the way the individual improvement points are counted and we have adopted another kind of reward. The adaptation turned the STAD to consist of only four components with different scoring and rewarding systems. What follows is how we actually proceeded for the adaptation.

2.1. Adapting Team Study and Quiz

In Slavin's original STAD, team study and the quiz are separate tasks except that students rely on what they learned from team study to succeed in the quiz. Further, what students produce in team study is not taken into consideration to decide on improvement points but only the quiz. In the adapted STAD, however, both group and individual works are graded and taken into consideration when determining the individual improvement points later. This means that the marks gained from team work products as well as the quizzes will be used to form an average – that is, if a group of four, for instance, got ***13/20*** in the group work and in the quiz **S1:***10* - **S2:***12* - **S3:***09* - **S4:***14*, their averages will be as follows (S refers to 'student'):

13 + 10 ÷ 2 = 11.5 ⟶ average of S1
13 + 12 ÷ 2 = 12.5 ⟶ average of S2
13 + 09 ÷ 2 = 11 ⟶ average of S3
13 + 14 ÷ 2 = 13.5 ⟶ average of S4

The averages students get represent their efforts when cooperating and when working individually. For us, both works should be graded and taken into account for students' success because we believe that if we do not give more value to the team work/study, students may not work as seriously as we want them to do. Hence, and since both the group study and the quiz contribute to how much their improvements are, we decided to gather them in one subheading being: **Group and Individual works**. It has to be mentioned that the averages will be compared to the base scores to figure the students' improvement points and teams' scores later, instead of the quiz scores only.

2.2. Adapting the Individual Improvement Scores' System

The marks earned by students from the group study or the individual quiz are out of 20 and not 100 as Slavin has suggested (The scoring system used in America is quite different from that we use in Algeria). Hence, the improvement points will not be determined on the basis of Slavin's criteria. The following table explains the new simpler system:

The status of the average score	**Improvement points**	**Improvement/No improvement**
Less than base score	00 point	No improvement
Equals base score	00 point	No improvement
0.25p above base score	2.5 points	Improvement
0.5p above base score	5 points	Improvement
0.75p above base score	7.5 points	Improvement
01p above base score	10 points	Improvement
02ps above base score	20 points	Improvement
03ps above base score	30 points	Improvement
X ps above base score	*Y* points	Improvement

Contrary to Slavin's system in which improvement scores do not exceed 30 points of improvement, our method permits students to get more than 50 points which we think very fair because students can get points for every improvement they achieve. For instance, if the base score of a student is *08* and the average is *13*, this means that there is 05 points above the base score (13-8=05) and the student in this case will get 50 points of improvement.

Here is a clear example of the achievement of a group:

Students	**Base scores**	**Averages**	**Improvement points**	**Total**	**Team average**
01	10	10 (+00)	00	45 points	11.25
02	07	11 (+04)	40		
03	12	11 (+00)	00		
04	13	14.5 (+1.5)	15		

We did our best to keep the same idea of the improvement points –that is, all students, even the less able ones, have the chance to improve their academic achievement. In the case of writing, it is not about who wrote best but about who improved more.

2.3. Adapting Team Recognition

Slavin's method does not encourage competition because teams have to reach certain criteria to get the reward; they are not competing with one another but working to exceed a given criterion. For Slavin (1995), there is a possibility that all groups can win. Further, the rewards Slavin has suggested are certificates or oral praises. In fact, this can be applicable to elementary students but not to university students. Our learners need competition and another kind of reward. For this reason, we suggested that the three best groups which have the highest team averages (improvement points) will get the rewards. This may raise motivation and hard work. Further, since our learners are university students, we believe that certificates will not help; they need a more valuable reward. 'A bonus score' seems the best choice, for it will contribute to their success, and it may largely increase their motivation to do better in the next STAD.

3. The Experiment

We carried out an experiment that involved a treatment (the adapted STAD) and a sample of 50 second year students (two groups, 25 in each) randomly chosen from the target population at the Department of Letters and English, University of Constantine 01. The experimental group received the treatment while the control group did not. According to the research hypothesis, we expect the [adapted] STAD method to have an efficient impact on the experimental group.

Before starting any STAD, we first explained cooperative learning to our students and how the STAD method works. Then, we employed the STAD five times during three months. In each STAD, we first presented the lesson, then we made them work cooperatively on a task related to the lesson presented earlier. In the next session, we tested students on the same type of task, but this time, they wrote individually (they had quizzes). Before the next STAD, we graded the group works and the quizzes, handed them to students then figured out the improvement points and finally rewarded the best achieving groups.

To investigate the impact of the adapted STAD on students' writing skill, we used the t-test (statistical test) to analyze the data obtained from the test and see whether there was a considerable difference in achievement between the groups. We believe that the t-test is the most appropriate tool of inferential statistics for it is a robust parametric test that yields significant statistics and helps compare sample means of two different groups taking randomly from a population (Ary, et al. 2010; Martella et al. 2013).

	Exp. Group		**Ctrl. Group**	
N	X_1	X_1^2	$X2$	$X2^2$
01	15	225	11.5	132.25
02	13	169	12	144
03	09	81	12.5	156.25
04	15	225	14	196
05	14	196	07	49
06	12	144	13	169
07	10	100	13	169
08	12	144	08	64
09	13	169	10	100
10	12	144	07	49
11	15	225	15	225
12	13	169	12.5	156.25
13	14	196	10	100
14	11	121	09	81
15	12	144	13	169
16	13	169	12	144
17	12	144	11	121
18	10	100	10	100
19	13	169	13	169
20	14	196	14.5	210.25
21	14.5	210.25	13	169
22	11	121	10	100
23	11	121	11	121
24	12.5	156.25	11	121
25	12.5	156.25	09	81
Total	$\sum X_1 = 313.5$ $\bar{x}_1 = 12.54$	$\sum X_1^2 = 3994.75$	$\sum X2 = 282$ $\bar{x}2 = 11.28$	$\sum X2^2 = 3296$

Table: The Experimental and Control Groups' Test Grades

The data we have for the computation are the marks/grades gained from the post-test of both the experimental and the control groups. Miller (1986) suggests the following general procedure for the computation of the t-test for independent samples (one-tailed).

To find the means ($\bar{x}$), we used the following formula: $\bar{x} = \frac{\sum X}{N}$

- For the Experimental Group we divided the sum of the students' grades ($\sum X_1 = 313.5$) by the number of students ($N_1 = 25$). Making the substitution, we found:

$$\bar{x}_1 = \frac{\sum X_1}{N_1} = \frac{313.5}{25} = 12.54$$

- For the Control Group we also divided the sum of the students marks earned in the post-test ($\sum X2 = 282$) by the number of the participants ($N2 = 25$). Making the substitution, we got the following result:

$\overline{x}2 = \frac{\sum X2}{N2} = \frac{282}{25} = 11.28$

To find the variances of both groups, the following formulae were used:

$S1^2 = \frac{\sum X1^2}{N1}$ (Experimental Group)

$S2^2 = \frac{\sum X2^2}{N2}$ (Control Group)

Making the substitution from table we find:

$S1^2 = \frac{\sum X1^2}{N1} = \frac{3994.75}{25} - 12.54^2 = 2.54$

$S2^2 = \frac{\sum X2^2}{N2} = \frac{3296}{25} - 11.28^2 = 4.61$

To calculate *t*, we used the following formula and made the right substitutions of the previously figured values: $\overline{x}1$, $\overline{x}2$, $N1$, $N2$, $S1^2$ and $S2^2$.

$$t\mathrm{N1} + \mathrm{N2} - 2 = \frac{(\overline{x}1 - \overline{x}2)\sqrt{(N1 + N2 - 2)N1\,N2}}{\sqrt{(N1\,S1^2 + N2\;S2^2)(N1 + N2)}}$$

$$= \frac{(12.54 - 11.28)\sqrt{(25 + 25 - 2)25 \times 25}}{\sqrt{(25 \times 2.54 + 25 \times 4.61) \times (25 + 25)}}$$

$$= \frac{1.26\sqrt{48 \times 625}}{\sqrt{(63.5 + 115.25) \times 50}}$$

$$= \frac{1.26\sqrt{30000}}{\sqrt{178.75 \times 50}}$$

$$= \frac{218.23}{94.53}$$

= 2.30

To find the value of the degree of freedom, we made use of the following formula:

$df = N1 + N2 - 2$

$df = 25 + 25 - 2 = 48$

The *df* value (48) will be used to read the t-table to figure out the critical value of *t.*

To find out the value of *t*, we should turn to the t-table and check the value corresponding to 48 degrees of freedom for 0.05 level of significance. We noticed, in fact, that there is no row for 48 degrees of freedom. In this regard Dietz and Kalof (2009:352) explain:

> *Looking in the t-table, the critical value for an alpha level of 0.05 and 48 degrees of freedom is not listed. But we have t values for 40 and 60 degrees of freedom. It is always better to be cautions and use fewer degrees of freedom than we actually have…*

Thus, we can use the value 40 to be our degree of freedom. Hence, for 40 degrees of freedom the value of *t* required for 0.05 level of significance is 2.021. According to Miller, the found value (2.021) has to be divided by 2 because our test is **one-tailed**. Therefore, the critical value of *t* that

will be compared to the calculated *t* is 1.010 (2.021÷2= 1.010). In the following table, it is clearly shown how we read the t-table.

	Level of significance				*Level of significance*		
df	·10	·05	·02	*df*	·10	·05	·02
12	1·782	2·179	2·681	29	1·699	2·045	2·462
13	1·771	2·160	2·650	30	1·697	2·042	2·457
14	1·761	2·145	2·624				
15	1·753	2·131	2·602	40	1·684	2·021	2·423
				60	1·671	2·000	2·390
16	1·746	2·120	2·583	120	1·658	1·980	2·358
17	1·740	2·110	2·567		1·645	1·960	2·326

*For a *one-tailed* test the significance levels should be divided by 2.

T-table (Miller, 1986:141)

When we compare the calculated *t* to the critical value of *t*, we find that 2.30>1.010 –that is, the value of the observed *t* of the experiment is greater than the critical value of *t* checked in the t-table. We may therefore conclude that the adapted STAD method has a positive impact on the achievement of the experimental group and that the research hypothesis is confirmed. We can then draw conclude that there is a significant difference of achievement between the two groups: the observed value of *t* of the experiment is found to be greater than the critical value of *t* (2.30>1.010). Thus, the result obtained proves the research prediction; it explains the cause-effect relationship between the two variables. This would allow us to consider that adopting a student-centered approach via cooperative learning (the adapted STAD) truly enhances learners' writing achievement.

Being aware of efficient cooperative skills is crucial to successful learning the material with peers. In effect, these skills are often not inherent, yet they can be taught and learned as well through practice and assessment during well structured group learning tasks (Hines, 2008). In this study, the adapted STAD was implemented to ensure peer interaction within the small groups in which they help one another understand the task and succeed in the whole work (group and individual works). While working together, learners are required to ask questions, explain and justify their opinions, set forth their reasons, and upgrade their knowledge for the sake of improving their learning. Therefore, we think that successful teams are closely related to collaborative skills and well-structured tasks in terms of awareness and implementation. Moreover, as its name suggests, cooperative learning means members of the same group cooperate in making their own learning, i.e. they share what they know together as every one of the team exchanges his strong points with the members of the teams. In other words, every member who has

a weak point learns from the others and in the end, they all learn and no more have weak points. The outcome is precisely that the teams become successful in the learning enterprise.

Conclusion

Learner-centered teaching through cooperative learning ([adapted] STAD) makes students active participants in the classroom and allows them to work together as a small family whose sole aim is to make this family successful. Writing is thus a social act, and cooperative learning is a way to ensure such a social context. For this reason, teachers should know that and make learners understand the major requirements for successful cooperative learning in the first place.

In the light of our experiment, the results obtained point to one clear conclusion: the [adapted] STAD method can be of great help for students to boost their writing skill. Substantially, we think that learning writing is closely tied to what we write as individuals and what others think of what we write. Peers can, in effect, act as guides and helpers, sustaining the purport that, after all, four brains are better than one!

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