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Effect of Fishbowl Activity on the Academic Achievements of Secondary School Students

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Abstract

This experimental study was intended to investigate the effect of collaborative learning technique; fishbowl on the academic success of students studying in a secondary school. A pre-test post-test equivalent group design was employed. The objectives of the study were; (i) to explore the effects of collaborative learning technique, fishbowl, on the academic achievement of the students in the subject of Pakistan Studies; (ii) to explore the differences between the scores of both the control and experimental groups on pre-test and post-test. For achieving these objectives, null hypotheses were formulated and tested. The 281284 secondary school students in Khyber Pukhtunkhwa constituted the population of this experimental study. Sixty eight 9th grade students of Government High School No.1, Nowshera Kalan were taken as a sample for the study. These students were divided into two groups - control and experimental - on the bases of pre-test scores. For this purpose, convenience sampling technique was applied. Students in the control group were instructed through conventional learning activities (lecture method) in the classroom, while students in the experimental group were given treatment of collaborative learning. Data were collected through pre-test, and post-test. The statistical techniques; mean, standard deviation, t-test and ANOVA were use in the data analysis process. The major findings were found as under; (1) Collaborative learning activity (fishbowl) improved the academic achievement of participants (2) the retention level of the students who learn collaboratively was better than those who learn through traditional learning methods.

Keywords: Collaborative learning, Fishbowl, Academic achievement, Retention level and group-work

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Introduction

Man is social and likes to learn in social circumstances. Collaborative learning approach is a proper answer to this human tendency. Therefore, most of the teachers consider collaborative interaction as beneficial for students in the process of learning encourages and motivates them to learn how to cooperate with people not only in a classroom setting but also in real life (Zarei & Gilani, 2012). John Dewey suggested that "students should not only learn from teachers but also from their peers". Peer learning is possible in group-work because students in group work not only learn from their peers, but also develop new skills and improve their learning abilities. The phrase, "sink or swim together" (Roger & Johnson, 1994, p. 1) highlights the importance of group-work.

In Pakistan, the standard of education is poor. Teaching/learning-process is limited to better numerical results in examinations. In addition, good teachers are those who complete their lessons in-time and leave the learners to prepare for the examination. The focus of such teachers is on their own performance which does not determine whether the learner acquired the targeted goals or not (Ahmad, 2009; p. 10).

Though computer-supported or in other word web-based collaborative learning is very popular nowadays in the educational settings and numerous researches have been conducted on it yet classroom-based collaborative learning is essential very much because in this era of technology, still 62% of the participants in the seminar had a preference for the physical presence of the professor during the lecture (Cogburn, 2001). It goes without any argument that different collaborative techniques have different effects. Therefore, the purpose of this study was to try to fill a part of the existing gap in an area which is in need of further exploration. Pakistan Studies (for class 9th and above) is the developed form of Social Studies (for class 8th and below in Pakistani education system) and this subject is learnt very well through constructivist learning approach and collaborative learning techniques because it is collaborative in nature and requires students to learn it together in pairs or in groups (Santrock, 2011). Since the most demanding thing of present day education in the world in general and Pakistan in particular is that teaching/learning process must be learner-centered. In such a situation in Pakistan the process of learning can occur if teachers facilitate it by employing various ways/strategies that may widen the scope of learning-activities. These ways and means (approaches) need careful application of learning principles and instructional strategies in Pakistan. Moreover, the education system dispossesses the students of their inborn power of observing, reflecting, questioning, critical thinking, curiosity, logic, thoughts, discovery, carrying out trial and different types of vision (Ahmad, 2009; pp. 17-18). It is also obvious that Pakistani education system kills creative and productive faculties of learners and makes them as passive learners rather than active participants (Farooq, 2014). Therefore it is needed to apply group learning activities for learning new things.

Fishbowl as a Collaborative Learning Technique

Fishbowl is a collaborative learning technique applied in classrooms where group dynamics (team performance, leadership style, and the interdependence between group members) are essential. Members of this technique are allowed for a more profound debate and argument about a certain theme or issue. It facilitates students to put up a cooperative spirit and concentrate on the manners used by a group to work together more effectively and efficiently (Barkley, 2005).

Steps for Setting up Fishbowl Activity (FA)

Fishbowl is used in many ways in the classroom. Students in small-group are placed in an interior circle (fishbowl panel) in the middle of a class-room. The fishbowl panel will perform a conversation collectively at the same time as the remnants (panel in the external circle) observe, write hints, and ask some questions soon afterwards and produce clarification and explanation. The instructor can sit either in the fishbowl panel or the panel in the external circle. To start on, those members are selected by the teacher for the fishbowl panel who are absolutely skillful at group-conversation. Sometimes, the teacher may intentionally pick out one or two novel students so that fishbowl may not seem too "perfect". After recognizing the group, the teacher announces clear cut policy and guidelines.

Procedure for the Fishbowl Activity (FA)

(1) The teacher must change places of the two circles after one round of a panel is completed. As all the members have gone through fishbowl panel and panel in the external circle, the instructor can pose some queries such as: What did you learn from each other? Express your feelings about small-group discussions. (2) The instructor can place a vacant chair in the internal panel (FP). The member of the external circle can come forward to the empty chair and continue the conversation unless another member from external circle requests to participate. That member then knocks that member, and they silently change their seats. (3) The instructor must, for a little time, go out of the fishbowl activity (FA), for making the group-dialogue more natural. However, the instructor must be present for resolving the conduct problems that are not in the control of internal and external circles. Therefore, the instructor must sustain group etiquettes.

Objectives of the Study

(1) To investigate the effects of fishbowl activity on the educational achievements of the learners in the subject of Pakistan Studies. (2) To explore the difference between pre-test and post-test scores of both the control and experimental groups. (3) To investigate the difference between mean achievement scores of High Achieving Students (HAS) and Low Achieving Students (LAS) of both the groups.

Hypotheses

1. The mean scores of experimental and control groups do not differ significantly based on pre-test.
2. The mean scores of experimental and control groups do not differ significantly based on post-test.
3. The mean scores of experimental and control groups are not significantly different based on retention test.

Research Method and Procedure

The 281284 secondary school students (classes IX – X) in public sector in Khyber Pukhtunkhwa (EMIS, 2011-12) composed the population of this experimental study. Sixty eight 9th grade learners of Government High School No. 1 Nowshera Kalan, District Nowshera were added in the sample. Pre-test scores provided the basis for placing the sample students into experimental and control groups through convenience sampling technique. Three teacher made tests, i.e. pre-test, post-test and retention test were used as the research instruments of this study. Ninety six multiple choice questions (MCQs) were included in the pre-test, selected unevenly from the first two chapters of 9th grade Pakistan Studies because both the chapters were not having the same volume of text materials. For investigating the academic achievements of the whole sample, the researcher administered pre-test to the sample students before the treatment was started. Post-test was then administered to sixty one sample students after the treatment was over (seven students were found absent from the post-test). After the duration of two and a half months, a retention test was also administered for both the groups. The numerical data, gathered through applying pre-test, post-test and retention-test was analyzed by applying *t*-test and ANOVA at 0.05 levels.

Findings of the Study

Table 1

Significance of difference between mean achievement scores of control and experimental groups on pre-test

Groups	N	Mean	SD	Df	Calculated value on t-test		Sig-level	p-value
Experimental	34	36.3	9.5					
Control	34	36.5	9.8	66	0.08	Not -Significant	0.05	1.980

Table 1 shows the results that 0.08 < 1.980, therefore, the H_o1 "mean scores of experimental and control groups do not differ significantly on pre-test" is accepted. It shows that, on previous test, both the groups obtained approximately equal mean achievement scores.

Table 2

Significance of difference between mean achievement scores of control and experimental groups on post-test

Groups	N	Mean	SD	Df	Calculated value on t-test		Sig-level	p-value
Experimental	31	61.871	18.85	59	7.310	Significant	0.05	2.000
Control	30	34.889	8.03					

Table 2 reveals that 7.310 > 2.000, therefore, the null hypothesis (Ho 2) "there is no significant difference between the mean scores of experimental and control groups on post-test" is rejected.

Table 3

Significant difference between mean achievement scores of high achieving students of control and experimental groups on post-test

	Groups	N	Mean	SD	Df	Calculated value on t-test		Sig-level	p-value
HAS	Experimental	15	64.7	17.97					
	Control	13	35.31	8.2	26	5.685	Significant	0.05	2.056

Table 3 shows the results as the calculated value (t=5.685) > (p=2.056) therefore the null hypothesis "there is no significant difference between mean achievement scores of high achieving students of both the groups on post-test" is rejected.

Table 4

Significance of mean difference between low achieving students of both the groups on post-test.

	Groups	N	Mean	SD	Df	Calculated value on t-test		Sig-level	p-value
LAS	Experimental	16	45.8	15.8	31	3.371	Significant	0.05	2.021
	Control	17	31	7.9					

Table 4 shows that t=3.37 > p=2.021, therefore the null hypothesis (there is no significant difference between mean scores of low achieving students of both the groups on post test) is rejected. Thus it has been proved that mean achievement scores (45.8) of LAS for experimental group on post-test is more than 31 (mean scores) of LAS for control-group.

Table 5

One Way ANOVA for significance of difference between mean scores of HAS and LAS for control and experimental groups on Post-test.

Variance Conditions	Sum of Squares	df	Mean Squares	Calculated value on f-test		Sig-level	Table/ P-value
Between the groups	10334.24	3	3444.75				
Within the groups	10070.93	57	176.68	19.497	Significant	0.05	2.76
Total	20405.17	60	340.09				

Table 5 shows that the calculated value (F=19.497) is significant at 0.05 (p=2.76) therefore it verified the significant effect of the treatment (Collaborative Learning) on the academic achievements of HAS and LAS for control and experimental groups.

Table 6

Difference between mean achievement scores of control and experimental groups on retention test

Groups	N	Mean	SD	df	Calculated value on t-test		Sig-level	p-value
Experimental	32	50.44	15.935	63	5.322	Significant	0.05	1.980
Control	33	31.42	7.5					

Table 6 shows the results that calculated value (t= 5.322) > (p=1.980), therefore the Ho3; “mean scores of experimental and control groups do not significantly different on retention test” is rejected.

Table 7

One Way ANOVA for mean difference between achievement scores of HAS and LAS for both the groups on Retention-test

Variance Conditions	Sum of Squares	df	Mean Squares	Calculated value on f-test		Sig-level	Table/ P-value
Between the groups	8297.634	3	2765.878				
Within the groups	8498.796	60	141.647	19.527	Significant	0.05	2.76
Total	20405.17	63	266.61				

Table 7 shows that the calculated value (F=19.527) is significant at 0.05 (p=2.76) therefore null hypothesis is rejected. It verified the significant effect of the treatment (Collaborative Learning) on the academic achievements of HAS and LAS for control and experimental groups.

Discussion

By comparing pre-test scores of both the groups (RE & RC), it was observed that no significant difference between the two mean scores of both the groups was found. Thus, both the groups were almost equal regarding their mean scores. Furthermore, on previous test scores, the mean difference between low achieving students of the experimental and control groups was insignificant at 0.05 levels. Similarly, comparison between mean pre-test scores of high achieving students of both the groups also showed that mean difference was not significant. Therefore Ho 1 “difference between mean scores of both the groups is not significant” is accepted because there is strong evidence that t-value (0.08) is less than p-value (1.980).

After receiving the treatment, mean scores of both the groups, on post-test, were found to be different. On t-test the (7.310) was found greater than the p-value (2.000) at significant level (0.05). This shows that as a collaborative learning technique "fishbowl" has significant effect on the learning achievements of learners (Table 2). Similarly, on post-test, mean difference between scores of high achieving students and low achieving students of both the groups were found significant (Table 3 and 4). Therefore the null hypothesis Ho 2 is rejected. For further verification One Way ANOVA was also applied to corroborate the results on t-test. It also shows the significant effect of the treatment (Fishbowl Learning) on the academic achievements of HAS and LAS for control and experimental groups, as shown in table No 5.

The above results, found in this study, are in the line with different researches conducted by Cuny and Wilde (2003). They are of the view that students in groups (during fishbowl activity) found the discussion more useful. Durkee (2014) conducted a survey study on the "assessment of collaborative learning techniques in supplemental instruction sessions" in which he found that SI leaders felt 15 percent comfort by using fishbowl technique and that 10 percent SI leaders used this technique once every week, 12 percent used it once every four week, and 15 % used it once every semester. In addition, relationships between SI Leaders' comfort and frequency in utilizing collaborative learning technique (fishbowl) outlined in their SI Leader Training Manual was found, through applying chi-square, as 57.84%.

Difference between mean achievement scores of both the groups on retention test was also found significant. The statistical analysis of students' retention revealed that the students who were given the treatment as collaborative learning, had overall higher retention level of subject matter or text materials than the students, taught through lecture-based instructional method. The evidence was that the computed quantity on t-test was 5.322, which was greater than p-value (1.980) at 0.05 (Table 6). These findings do not defend the Ho3 that, "Difference between the mean scores of control and experimental groups on retention-test does not exist". The calculated results on t-test were then verified through the application of F-test on significance level 0.05 (Table 7).

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