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Research Article

Effectiveness Of Fractional Group Presentation (FGP) On Learning Achievement Of Higher Secondary School Students

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ABSTRACT

The intent of the research was to investigate the effect of fractional group presentation (FGP)on learning achievement of +2 Arts Education students. The present research study was an experimental study and pre-test post-test control group design. In this study +2 Arts Education class was selected purposively but for group distribution stratified random sampling was chosen by administering Kolb's learning style inventory. Data were collected through academic achievement test and reaction scale. The findings obtained from collected data showed that fractional group presentation method has a more positive effect on increasing students' learning achievement. The reaction scale analysis showed that group learning for fractional group presentation provides opportunities for students to explore their presentation skills, understanding level, interest generation & boosted learning by doing. The study provides rational and empirical support to the use FGP in different class rooms/settings or to different disciplines.

[Fractional group presentation, Higher Secondary School, Collaborative learning, social interdependence, Learning Achievement,]

Background of the Study

The most effective presentations are informative, educational, and entertaining (Gallo,2009). Fractional group presentation (FGP) is a collaborative approach in which the entire class room are distributed in small fractional groups. Each group will work for a common presentation (broad topic) collaboratively as well individually (a small fraction of the broad topic) as each one has to work for a common collective goal i.e., how s/he will present his part efficiently too. Researcher like Kurt Lewin ,1935 & Morton Deutsch, 1949 argues that collaborative group size is many times hinge on the social interdependence theory. Simultaneously affirm that social interaction always relied on social interdependence and finally but potentially leads to positive outcomes among students. Therefore, social interdependence is a key constituent for establishing the structure of the group/collaborative group, that increases cohesiveness among the group members leads to build quality relationships and support each other's learning

(Johnson & Johnson, 2008). Firlik (2002) advocated that, active learning requires a collaborative team activity where all students must be actively engaged. So active learning needs engagement and fractional group presentation helps each and every learner to be engaged. Active learning may be characterized as the involvement of students in higher order thinking say for instance engaged in higher order skills like analysis, synthesis, reflection and evaluation, they may involve in activities like reading, writing, discussion and more importantly exploration of their own in terms of attitude and value (Bonwell and Eisen, 1991). Smaller group size and its importance is crucial for increased participation at individual level in the peer teaching processes, which consequently leads to enhanced learning (Kooloos et al., 2011; Panadero and Jarvela,2015). A traditional set of instruction which is always based on examination that may not fulfil the present necessity because it's result will not reflect the demands of the recent advancement in life (Byrd,2012). For that said reason lesson should exhibit different hand to hand activities of students while teaching the concrete knowledge (Bozkurt, Orhan, Keskin & Mazi, 2008; Tran, Nguyen, Van De, Soryaly & Doan,2019). Sometimes instructional strategies turn a boring lesson into fun filled, interesting and informative lessons (Fieldman & Pirog,2011). This may be possible through cooperative learning model (CLM). CLM makes learning environment constructive, interesting and fun filled (Cullen,2012). Due to the attributes of CLM a

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method was developed known as reading, writing and presentation (RWP)in cooperative working group by Aksoy,2011. Studies indicates that in cooperative learning students develop positive attitude. Studies also indicates that students understand the subject matter when they read (Graham, Gillespie& McKeown,2013). Reading helps the student to comprehend the subjects (Zumbrunn &Brunning ,2013). Then students start reflection of their comprehension on the subject (Asoodeh, Asoodeh & Zarepour,2012) then present their reflection effectively. In this context the purpose of this study is to determine effectiveness of FGP on academic achievement of higher secondary school students (+2).

Objective of the Study

- To compare the adjusted mean achievement score of experimental group and control group of pre-tests by taking pre-achievement score as covariate.
- To compare the adjusted mean achievement score of experimental group and control group of post-tests by taking pre-achievement score as covariate.
- To access the reactions of experimental group students towards fractional group presentation method.

HYPOTHESIS

Ho1: There is no significant difference in the adjusted mean achievement scores of experimental group and control group of pre-tests by taking pre-achievement score as covariate

Ho2: There is no significant difference in the adjusted mean achievement score of experimental group and control group of post-tests by taking pre-achievement score as covariate.

Ho3: There is no significant difference between observed frequency and expected frequency against equal probability in terms of reaction towards fractional group presentation.

Research Methodology

Research design & study group

This research study is a quantitative true-experimental study. The investigator used pre-test, post-test control group design. this design is basically used to determine the effect of one variable on the concerned issue (Karasar,2005). For the present research the investigator purposively chosen all the +2 1st year Arts education students of Rural Institute of Higher secondary school as the population and 64 regular education students out of 76 are the participants.

Data collection tools

Research made pre post achievement test and reaction scale was used for this study. The test contains total number of 50 questions which was sent to 4 experts for validation. The questions scored about 100%, 75% & 50% are accepted and 25% and 0% are rejected. Among 50 number of questions the final draft contains only 30 questions and 20 questions have been rejected by the experts. Now the same test was administered among 10 students two times in an interval of 12 days and test -retest reliability was calculating as 0.91. Hence the final achievement test contains 30 questions is ready to collect data from the students.

FGP study steps

Curriculum and instructional materials were same for both the groups as implemented by Council of Higher Secondary Education (CHSE), of School and mass education, Odisha.

The study hour and period duration were same. the only difference between the group was the method implemented during experiment.

1. Study steps for control group

All the instruction, instructional materials were carried out as per the instruction prescribed by Council of Higher Secondary Education (CHSE). Before instruction students were pretested and after instruction, they are Post tested.

2. Study steps for Experimental group

The students take a revision of key language areas of the content to be presented and prepared an outline or transcript of the entire presentation with a focus on linking and signally words. In the very next step students are fractionalized into small groups on the basis of their learning style. The students in each group will decide collaboratively that who is going to present what and how. Now the student presenter prepares suitable pictures & visuals to make the presentation effective. In the final stage before presentation, they practise at their own end in front of their groups. Now the students are ready to transects the presentation in front of the class (all peer groups). The teacher takes notes for correctional feedback to the individual group members, those are presenting in front of their peers. Theses feedback processes are immediate and just after completion of their presentation.

Group Formation Mechanism

After taking permission from principal of RIHS, Higher secondary school the investigator concern with the +2 1st year Arts students and aware them about the objectives of this research study. The investigator applied Kolb's learning style inventory to know the learning style of different students. The preferences of learning style must be considered before instruction to maximize learning (Fine, 2003). Learning style is always individual centric information processing system in the due course of learning new principles or concepts (DeCecco & Crawford, 1974). Hence all the 64 students are stratified into four categories like 13 Activist, 21 theorist, 12 reflector and18 pragmatist as per their responses.

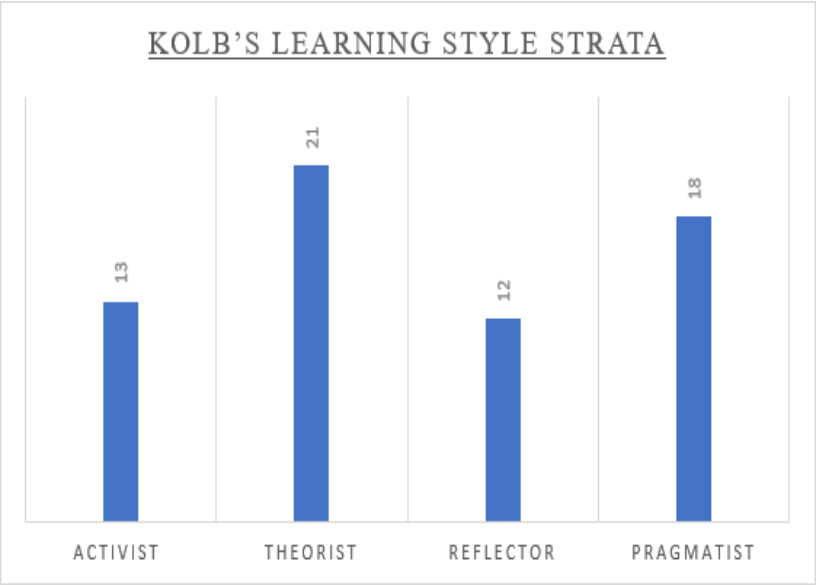

Fig 01 Showing the result of Kolb's learning style inventory

Now simple random sampling technique was used for randomly assigning two different groups as experimental group and control group. Each group consists of 32 students, out of which the first group having 7-activist, 10- theorist,6- reflector & 9- pragmatist and second group having 6-activist, 11- theorist,6-reflector & 9- pragmatist respectively. The investigator randomly selected the second group through fish bowl as experimental group and 1st group as control group. Then the investigator took 21 periods of 45 minute per period for both groups. The investigator assign topic named was "Growth and Development" to experimental group and divided topic among the students in small fractions to study at home and prepare their presentation. Further the experimental group was divided into eight groups on the basis of ability and learning style and each group consists of four members. Each students have unique style of learning, different strength or weaknesses and unique preferences of information processing (Fleder,1996). At the same time the investigator teaches the control group as a whole in lecture method. Finally, the investigator takes an achievement test.

Study Design

The researcher followed pre-test post-test control group design, which is coming under true- experimental design. The design is depicted below.

Table 1. Pretest-Posttest control group Design

Sampling technique	Group	Pre-test	Treatment	Post-test
Random (R)	Experimental	**O**	**X**	**O**
	Control	**O**		**O**

Result and Discussion

The study sought to test the effectiveness of fractional group presentation on learning achievement of secondary school students in RIHS, Higher secondary school by establishing whether there is a statistically significant difference between experimental and control group in terms of learning achievement or not. The study tests the normality of experimental and control group (Table 2). Further the test of normality was found to be normal.

Test of normality for control and experimental group

Table no 2. Table Showing Shapiro-Wilk test of normality

Group	Shapiro-wilk			
	Statistics	df	Exact significance	Level of significance
Cont. Gr.	0.977	32	0.724	>0.05
Exp. Gr.	0.936	32	0.057	>0.05

From the above Table no: 01, it can be inferred that both the groups are normally distributed as the Shapiro-Wilk value 0.724 for control group & 0.57 for treatment group. Both the values are greater than p-value 0.05 which implies that, both the groups are normally distributed during pre-test.

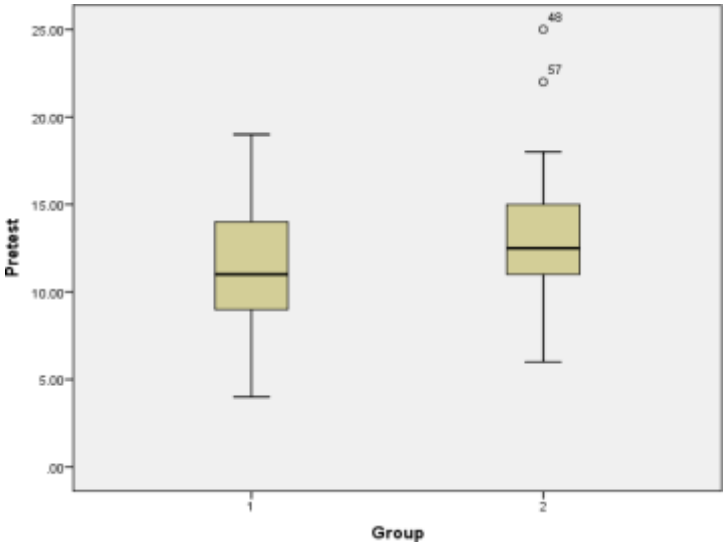

Fig No:02 Showing the expected and observed value of control and experimental group

From the above figure no 02, it can be clearly inferred that the control group (1) is normally distributed whereas the experimental group (2) too with slight deviation with respect to expected and observed value of normality.

Table no: 03 Table Showing Group statistics of control group (Cont. Gr.) & Experimental group (Exp. Gr.).

Group statistics					
Treatment	Group category	N	Mean	Sd.	SEM
Pre-test	Cont. Gr.	32	11.25	3.81	0.67
	Exp. Gr.	32	13.21	3.92	0.69
Post-test	Cont. Gr.	32	16.34	3.65	0.64
	Exp. Gr.	32	21.84	3.03	0.53

The table no 02 indicated that, the group statistics including mean and Sd. of control group and experimental group in pre-test as 11.25 & 3.81 and 13.21and 3.92 respectively, whereas the mean and Sd. of control group and experimental group in post-test is 16.34 & 3.65 and 21.84 & 3.03 respectively. There is a mean difference of 5.5 between experimental and control group.

Pre-Test Scores

Table No.04 Mean and S.D value of control & experimental group during pre-test

Sl. No	Group	Mean	Sd.	Calculated t' value	df	Level of significance	
						0.05	0.01
1	Cont. Gr.	11.25	3.81	2.04	62	2.00	2.66
2	Exp. Gr.	13.21	3.92				

The table no.1.0 revealed that, during pre-test the mean score of control group is 11.25 and simultaneously S. D is 3.81. In the experimental group the mean score is 13.21 and S.D. is 3.92. The mean difference of experimental and control group is 1.96. finally, it proves that the experimental group scores are scattered and the control group scores are clustered around the mean. The calculated t'- value is 2.04 and tabulated t' value is 2.00 at 0.05 and 2.66 at 0.01 level. As the calculate t'-value is less than the tabulated t' value, hence the null hypothesis there in no significance difference between control and experimental group during pre-

test is accepted.

Post-Test Score

Table No. 05 The table shows that mean, S.D and t scores of posttests)

Sl. No	Group	Mean	Sd	df	t'- value	Level of significance	
						At 0.05	At 0.01
1	Experimental	16.34	3.65	62	6.62	2.00	2.66
2	Control	21.84	3.03				

The table no.05 revealed that, the mean & Standard deviation (Sd) value of control group is 16.34 and 3.65 respectively and the mean & Sd value of experimental group is 21.84 & 3.03 respectively. The calculated t-value is 6.62. The t' value is 2.00 and 2.66 at 0.05 & 0.01 level of significance respectively. Since the calculate t'-value i.e., 6.62, which is greater than the tabulated t'-value, so it may be concluded that there is a significant difference between experimental and control group in terms of achievement.
Comparison of mean achievement scores of control group and treatment group by taking pre-achievement as covariate.

Table No. 06 Showing ANCOVA for Tests of Between-Subjects Effects

Tests of Between-Subjects Effects						
Source of variation	Sum of Squares	df	Mean Square	F	Sig.	Sig. level
Treatment	446.258	1	446.258	20.98	0 .000	< 0.01
Error	1318.797	62	21.271			

Table no 06 narrated that, the adjusted F-value for treatment group is 20.980 with degree of freedom (1,62) is 0.000 which is lesser than 0.01, hence is significant at 0.01 level of significance. It indicates that, the adjusted mean achievement scores of experimental groups taught through FGP and control group differ significantly when pre-achievement was taken as covariate. In this light the null hypothesis there is no significant difference in the mean achievement score of control group & experimental group in post-test by taking pre- achievement scores as covariate is rejected. Further from the table no 02 i.e., group statistics There is a mean difference between experimental 21.84 and control group 16.34 is 5.5. Hence it may be inferred that, the FGP was significantly effective than the traditional approach in enhancing learning achievement among the learners.

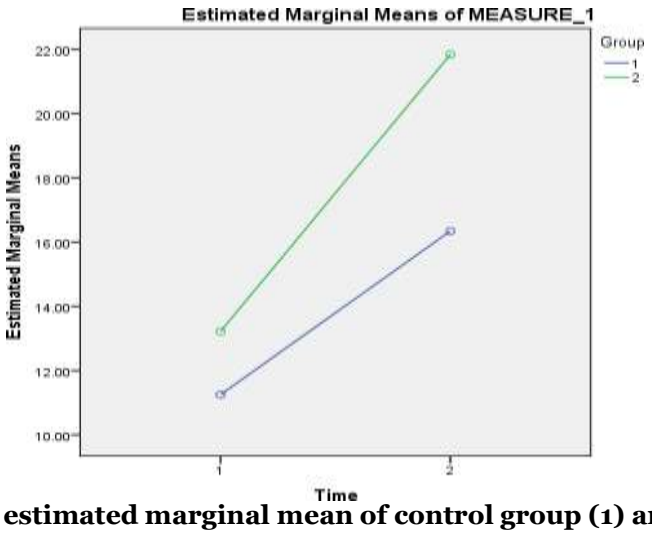

Fig No:03 Showing the estimated marginal mean of control group (1) and experimental group (2)

From the above fig no 03, It can be clearly inferred that, the achievement scores of experimental groups-2 is significantly higher than the control group-1.

Student Reaction

It is revealed from the student's reaction scale towards FGP that, the effectiveness of fractional group presentation helps encouraging students to interact and communicate more with their peers as well as it increases the confidence level of students for active participation in class room. Further it is revealed that 82.17 % of students saying that, they are strongly agree regarding FGP as fractional group would help them to solve other difficulties, they can independently keep their views, learning by doing was boosted. Further 46.62% students saying that FGP is interesting and they can suggest FGP for other class room. Out of all students 26.64% of students agree that studying through FGP is boring simultaneously 79.92% students have expressed their agreement that while study through FGP, we were able to think without any pressure. 53.28%

of students give their opinion that, FGP is better than the traditional class room but enough time was not given for discussion. Comprehensively students showing their agreement in favor of FGP which may help them in different aspect of generating knowledge, developing concept, attaining concept and create intrinsic motivation for presentation, group discussion and collaborative learning. Hence from the chi-square value it is clear that the FGP was found to be effective hence the null hypothesis, there is no significant difference between the observed frequencies and expected frequencies against equal probability in terms of reaction towards the fractional group presentation is rejected.

Findings and Discussion

It was from the t-test that, there is no significant difference between the control and experimental group after pre-test and both the groups are normally distributed. Further from the t-test it can be said that, there is a significant difference between control group and experimental group after intervention and post test. From mean difference analysis it may be concluded that the treatment group student's performance is better than the control group. This finding may be because of treatment (FGP), which was given to experimental group. Different research studies suggested that, cooperative learning in groups is helpful in enhancing students' academic achievement (Durukan,2011; Aydin, 2011; Genlott & Gronlund, 2013; Marzban & Akbarnejad,2013; Tarhan, Ayyildiz, Ogunc & Sesen, 2013; Zoghi,2013; Aghajani &Adloo,2018; Wiratno,2020). From ANCOVA analysis, the adjusted F-value for treatment group is 20.980 with degree of freedom (1,62) is 0.000 which is lesser than 0.01, hence is significant at 0.01 level of significance. It indicates that, the adjusted mean achievement scores of experimental groups taught through FGP and control group differ significantly. When groups are small in size then the instructional strategies are effective which in turn enhance task accomplishment and performance too (Khong, Liem &Klassen, 2017).

The reaction scale suggests that, out of all students 82.17 % of students saying that, they are strongly agree regarding FGP as fractional group would help them to solve their problems, they can independently keep their views, learning by doing was boosted. All the groups afford learning support for their group members as well they motivate each other for attendance & preparation for class, which leads to student connectivity, good interpersonal relationship and make them recognize that good communication skill and collaboration are very much essential for their success (Kraft, 1985, Michaelsen, 1983). Further out of all students 46.62% students saying that FGP is interesting and they can suggest FGP for other class room. Simultaneously 79.92% students have expressed their agreement that while study through FGP, we were able to think without any pressure, 53.28% of students give their opinion that, FGP is better than the traditional class room but enough time was not given for discussion & 26.64% of student express their views and fillings that while studying through FGP we express that it was quite boring.

Conclusion

Although different institutions and University teachers have identified and recognized the value of collaborative group work but inside the class room it still remains uncommon. It is the high time for thinking and conceiving a large class learning. Fractional group presentation can be used effectively in different classroom settings including adult education classes. These strategies can be used for socialization among students, enhancing achievement and improve attitude towards learning and working in groups from diverse cultural background. This study provides a better understanding of the communicative moves which involves the students in class room activities and transfer the responsibility successfully from the teacher to the learner in a positive way. All the groups afford learning support for their group members as well they motivate each other for attendance & preparation for class, which leads to student connectivity, good interpersonal relationship and make them recognize that good communication skill and collaboration are very much essential for their success (Kraft, 1985, Michaelsen, 1983). The assessment of the effectiveness of fractional group learning in communication skills encompasses not only its cognitive but also its affective dimension. On the due course of evaluation at the end of the study students displayed very positive reaction towards fractional group presentation and learning through it. Results indicated that students feel that fractional group learning builds better relationship among students.

As cohesiveness increase, student commitment to group goal increases, feelings, personal responsibilities to the group increases, persistence in working towards goal achievements increases and so productivity too increases in group learning. Students works collaboratively, cooperatively and productively by sharing roles and tasks to construct knowledge together. Achievements is a we thing not a me thing always the product of many heads and words (Atkinson ,1964).

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References

1. Aghajani, M. & Adloo, M. (2018). "The Effect of Online Cooperative Learning on Students' Writing Skills and Attitudes through Telegram Application". International Journal of Instruction, 11 (3), 433-448
2. Aksoy, G. (2011). "Effects of reading-writing-application and learning together methods on student's understanding of laboratory experiments in science and technology course". Unpublished Doctorate Thesis. Atatürk University, Erzurum, Turkey.
3. Asoodeh, M.H., Asoodeh, M.B. & Zarepour, M. (2012). "The impact of student-centered learning on academic achievement and social skills". Procedia – Social and Behavioral Sciences, 46, 560-564.
4. Atkinson, J. W. (1964). "An Introduction to Achievement Motivation". New York: Van Nostrand.
5. Aydın, S. (2011). "Effect of cooperative learning and traditional methods on students' achievements and identifications of laboratory equipment in science technology laboratory course". Educational Research and Reviews, 6 (9), 636 - 644.
6. Bonwell, C. C. & Eisen, J. A. "Active learning: Creating excitement in the classroom".
7. Technical Report, George Washington University, Washington, DC, 1991.
8. Bozkurt, O., Orhan, A.T., Keskin, A. & Mazi, A. (2008). "The effect of cooperative learning method to the academic achievement in science and technology lesson". The Journal of Turkish Social Research, 2, 63-78.
9. Byrd, D. (2012). "Social Studies Education as a Moral Activity: Teaching towards a just society". Educational Philosophy and Theory, 44 (10), 1073-1079.
10. Çelik, S., Aytın, K. & Bayram, E. (2013). "Implementing cooperative learning in the languageclassroom: opinions of Turkish teachers of English". Procedia Social and Behavioral Sciences, 70,1852-1859.
11. Cooper, M.M. (2005). "An introduction to small-group learning". Pearson Prentice Hall: NJ
12. Cullen, D.M. (2012). "Model engagement for your students". Journal of Chemical Education, 89, 565-566.
13. DeCecco, J. P. & Crawford, W. R. (1974). The psychology of learning and instruction: Education psychology (2nd ed.). Englewood Cliffs, NJ: Prentice-Hall Inc.
14. Deutsch, M. (1949). "A theory of cooperation and competition". Human Relations, 2, 129– 152.
15. Durukan, E. (2011). "Effects of cooperative integrated reading and composition (CIRC) technique on reading-writing skills". Educational Research and Reviews, 6 (1), 102- 109.
16. Felder, R. M. (1996). Matters of style. ASEE Prism, 6(4), 18–23.
17. Feldman, A. & Pirog, K. (2011)." Authentic science research in elementary school after-school science clubs". Journal of Science Education and Technology, 20, 494-507.
18. Fine, D. (2003). "A sense of learning style". Principal Leardership (High School Ed.), 4(2), 55-59
19. Firlik, R. J. (2002)." A need for active learning: A cross-cultural perspective". (ERIC Document Reproduction Service No. ED 461415).
20. Genlott, A.A. & Grönlund, A. 2013. "Improving literacy skills through learning reading by writing: the IWTR method presented and tested". Computers & Education, 67, 98-104.
21. Graham, S., Gillespie, A. & McKeown, D. (2013). "Writing: importance, development, and instruction". Reading and Writing, 26 (1), 1-15.
22. Johnson, D. W., & Johnson, R. T. (2008). "Social interdependence theory and cooperative learning: The teacher's role". In The teacher's role in implementing cooperative learning in the classroom (pp. 9-37). Springer, Boston, MA. https://doi.org/10.1007/978-0-387-70892- 8_1
23. Khong, J. Z., Liem, G. A. D., & Klassen, R. M. (2017). "Task performance in small group settings: The role of group members' self-efficacy and collective efficacy and group'scharacteristics". EducationaPsychology 37(9), 1082–1105.https://doi.org/10.1080/014434 10.2017.1342767
24. Kooloos, J. G., Klaassen, T., Vereijken, M., Van Kuppeveld, S., Bolhuis, S., & Vorstenbosch,
25. M. (2011). "Collaborative group work: Effects of group size and assignment structure on learning gain, student satisfaction and perceived participation". Medical Teacher,33(12),983–988. https://doi.org/10.3109/0142159x.2011.588733
26. Kraft, R. G. (1985). "Group-inquiry turns passive students active". College Teaching, 33 (4: Fall) 149-54.
27. Lewin, K. (1935). A dynamic theory of personality. New York: McGraw-Hill
28. Michaelsen, L. (1983). "Team learning in large classes. In Learning in groups". New Directions for Teaching and Learning No. 14. San Francisko: Jossey-Bass.
29. Panadero, E. & Jarvela, S. (2015). "Socially shared regulation of learning: A review".
30. European Psychologist,20(3),190–203.https://doi.org/10.1027/1016-9040/a000226

31. Splichal, J. M., Oshima, J., & Oshima, R. (2018). “Regulation of collaboration in project-based learning mediated by CSCL scripting reflection”. Computers & Education, 125, 132–145. https://doi.org/10.1016/j.compedu.2018.06.003
32. Tarhan, L., Ayyıldız, Y., Ogunc, A. & Sesen, A. (2013). “A jigsaw cooperative learning application in elementary science and technology lessons: physical and chemical change”. Research in Science & Technological Education, 31 (2), 184 - 203.
33. Tran, V. D., Nguyen, T. M. L., Van De, N., Soryaly, C. & Doan, M. N. (2019). “Does cooperative learning may enhance the use of students' learning strategies”? International Journal of Higher Education, 8 (4), 79-88.
34. Wiratno, P. (2020). “Improving students’ writing ability through cooperative learning type jigsaw”. JETA (Journal of English Teaching and Applied Linguistic), 1 (2), 28-38.
35. Zoghi, M. 2013. “Let’s Cross the Rubicon: strengthening reading comprehension instruction”.
36. Procedia- Social and Behavioral Sciences, 70, 537-543.
37. Zumbrunn, S. & Bruning, R. (2013). “Improving the writing and knowledge of emergent writers: the effects of self-regulated strategy development”. Reading and Writing, 26 (1), 91-110.