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# Effectiveness of Cooperative Learning Strategy among Secondary Level Students in Nepal

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**Abstract**

*This study aimed to evaluate the effectiveness of cooperative learning strategies in improving the academic performance, motivation, and retention of secondary-level students in health and population education. An experimental research design was employed, involving pre-test and post-test assessments of two equivalent groups of grade ten students from two schools in Kirtipur. The experimental group was taught using cooperative learning methods, while the control group followed traditional teaching approaches. Data were collected using a validated 30-item multiple-choice achievement test. Statistical analyses, including mean scores, standard deviations, variances, and t-tests, indicated a significant improvement in post-test scores for the experimental group compared to the control group. These findings confirm the effectiveness of cooperative learning in fostering active engagement and critical thinking among students. It is recommended that cooperative learning strategies be integrated into teaching practices to enhance student participation and academic achievement in Nepalese schools.*

**Key words:** *Cooperative learning, public schools, health and population education*

## Introduction

Health and population education is an essential and important discipline of school education and human life. Knowledge of health and population education is highly important to all the people irrespective whether a person is literate or not. It is both a body of knowledge and the process of acquiring and refining knowledge. Our daily life activities are influenced by the principles of health and population education. Hence, health and population education has been developed through the human effort in different periods and has attempted this state still on the process of development (Jain et al., 2024). In health and population education, teaching and learning method plays a vital role in students' achievement. In context of Nepal high school teachers adopt traditional teaching methods in their classrooms. In traditional lecture method, teachers just used the chalks on the blackboard and talk in teaching health and population education without carrying the active participation (Acharya, 2024;

Keramati & Gillies, 2024). This method of teaching health and population education is not better way for desirable changes of students. This is not a good method for promoting and critical thinking in the classroom. An educational approach which aims to organize classroom activities into academic and social learning experiences.

Furthermore, the teacher's role changes from giving information to facilitating students' learning . Everyone succeeds when the group succeeds. Sucipto et al. (2024) describe "successful cooperative learning tasks as intellectually demanding, creative, open-ended, and involve higher order thinking tasks. Five essential elements are identified for the successful in cooperation of cooperative learning to the classroom. Cooperative learning is the deliberate to instructional use of small groups of students who work together to maximize each others learning. Cooperative learning is theoretically based on the work of psychologist like Levi Vygotsky, Jean Piaget, Jerome Bruner among others who propose that children actively construct knowledge in a social context (Moin, 2024). The teacher therefore should create room for cooperation amongst students for effective cross-fertilization of ideas and knowledge sharing. No child learns effectively in isolation.

Nepalese students have faced difficulty in learning health and population education at school level, because of their poor teaching method. In the classroom environment, teachers used the traditional teaching method without the involvement of the students participation (Mantau & Buhungo, 2024; Salameh et al., 2024). Effective teaching learning method contributes students to learn being more active. So, the researcher investigated the effectiveness of the co-operative learning an academic performance of students in health and population education in order to find out which one of them was more effective learning as increasing retention, fostering team building and developing higher level thinking skills in order to ascertain the effectiveness of co-operative learning method. This may be one of the reasons of why many students' become failure in health and population education. Therefore, this study is to increase students' curiosity, participation and motivation towards the health and population education. It would be helpful to identify the effectiveness of cooperative learning method in health and population education. To find out the effectiveness of co-operative learning strategy method in population education.

**Method**

Experimental research design is used in this study. This study was conducted with the pre-test and post-test by selecting two equivalents naturally situated group. Two equivalent naturally situated groups of students were selected. One group experimental and other is control group with coin-toss method. Experimental group was taught by using cooperative learning method and control group by traditional method. Total students studying at secondary level in all the schools of Kirtipur was the population for this study. Students of grade ten from two schools were sample of this study. The two schools from which sample students were selected school 'A' and school 'B' respectively.

The primary sources of data for this study were collected from achievement test obtained by the students in pre-test and post-test. Two secondary school students

of Kirtipur was selected purposively. Two schools of the students sampling and decided by the simple random sampling method. An achievement test was the tool for this study. 50 items were prepared for the achievement test. All items were objective type with four alternatives but only one correct option. All the questions were included from health and population education. It consisted 25 knowledge level and 25 comprehensive level of cognitive domain. To verify the achievement test, a pilot test was administrated. Pilot test was administered among 20 students enrolled in grade X of a public secondary school at Kirtipur municipality. 30 questions were selected as the tools for this study. The achievement scores were used for item analysis, 27 percent answer sheet from higher scores and 27 percent answer sheet from lower scores (Muskens et al., 2024).

The researcher visited to the sample schools and requested the authority for co-operation to conduct an achievement test and to research those students for two weeks. At the beginning, achievement test (pre-test) was administered to experimental and control groups of students for sample school. The research collected data to analyze. The experimental and controlled groups were cooperative method and traditional method respectively. The output of instructional period the achievement text (post-test) was administrated to both groups of sample students with the help of school health and population education teachers. The test paper (pre-test and post-test) of sample students were collected and preceded manually. Then the researcher gathered the data and tabulated for analysis. Significance of difference between the mean score of both experimental group and control groups on the variables of pre-test and post-test the scores were tested at 0.05, level of significance by applying t-test.

**Result**

It is found that the pre-test was taken to find out the proficiency level knowledge of both group of students before treatment and it also gave information either the group was homogeneous or not.

**Table 1**

Analysis of average mean score and percentage of scores obtained by the selected school students before treatment.

| | Controlled group | | Experimental group | |
|---|---|---|---|---|
| | Mean score | % score | Mean score | % score |
| School A | 9.9 | 29.7 | 11.2 | 33.60 |
| School B | 9.7 | 29.10 | 10.3 | 30.90 |
| | Average mean-score | Average % score | Average mean score | Average % score |
| | 9.80 | 29.40 | 10.75 | 32.25 |

Table 1 shows that the mean scores and percentage scores obtained by the student before treatment. The mean scores and percentage score obtained by the students of controlled group of school 'A' before treatment were 9.9 and 29.7 respectively. The means scores and percentage score obtained by the students of experimental group of school 'A' was 11.2 and 33.60. Similarly, mean scores and percentage score obtained

by the students of controlled group of school 'B' before treatment were 9.7 and 29.10. The mean score obtained by the students of experimental group method group of school 'B' before treatment were 10.3 and 30.90 respectively. The average mean scores and average percentage of score were 9.80 and 29.40 for controlled group while 10.75 and 32.25 for experimental group. The mean percentage scores for traditional method and cooperative teaching method students were found be nearly equal.

**Table 2**

Pre-test scores obtained by the students taught by lecture and co-operative method

| Group | Sample size | Mean | S.D. | Variance | t-value | Remarks |
|---|---|---|---|---|---|---|
| Controlled group | 10 | 9.9 | 2.07 | 4.29 | 0.27 | 0.27 < 2.101 |
| Experimental group | 10 | 11.2 | 1.48 | 2.2 | | |
| $t_{0.05, 18}$ = 2.101 | | | 0.05 level of significance | | | |

Table 2 indicates that the controlled group at school "A" had a pretest mean score of 9.9, a standard deviation of 2.07, and a variance of 4.29. The mean score for the pretest experimental group was 11.2, with a standard deviation of 1.48 and a variance of 2.2. The calculated t-value was found to be 0.27 which was less than the tabulated t-value (t = 2.101) at 0.05 level of significance using two tailed test with degree of freedom 18. This study showed that the groups were equivalent and homogenous before treatment.

**Table 3**

Analysis of total pre-test scores obtained by the students taught by traditional method and co-operative teaching method of both schools

| Group | Sample size | Mean | S.D. | Variance | t-value | Remarks |
|---|---|---|---|---|---|---|
| Controlled group | 20 | 9.8 | 2.29 | 5.26 | 0.40 | 0.40 < 2.02 |
| Experimental group | 20 | 10.75 | 1.70 | 2.89 | | |
| $t_{0.05, 18}$ = 2.101 | | | 0.05 level of significance | | | |

It was found that the mean score, standard deviation and variance obtained in the pre-test by controlled group of both schools was 9.8, 2.29 and 5.261 respectively. The mean score, standard deviation and variance obtained in pre-test by experimental group were found to be 10.75, 1.70 and 2.89 respectively. The calculated t-value was determined at 0.40 which is less than the tabulated t-value (t=2.02) at 0.05 level of significance used two-tailed test with degree of freedom 38.

**Table 4**

Analysis of average means scores and percentage of scores obtained by the students taught by traditional method and co-operative method in post-test

| | Controlled group | | Experimental group | |
|---|---|---|---|---|
| | Mean score | % score | Mean score | % score |
| School A | 12.5 | 37.5 | 17.5 | 52.50 |

| | | | | |
|---|---|---|---|---|
| School B | 13 | 39 | 19.3 | 57.9 |
| | Average mean-score | Average % score | Average mean score | Average % score |
| | 12.75 | 38.25 | 18.40 | 55.20 |

Table 4 shows the mean scores and percentage scores obtained by controlled group and experimental group in post-test. The mean score and percentage score obtained by controlled group of school 'A' was 12.5 and 37.5. Similarly, mean scores and percentage score obtained by experimental group of school 'A' was 17.5 and 52.50. The mean score obtained and by the controlled group student of school 'B' taught was 13 and 39. While mean score and percentage obtained by experimental group of school 'B' taught by co-operative method was 19.3 and 57.9 respectively. The average mean scores and average percentage scores were found to be 12.75 and 38.25 for controlled group. While 18.40 and 55.20 for experimental group. This study indicated that the result of co-operative teaching method treatment was more effective than traditional method treatment in health and population teaching at secondary level because co-operative teaching model was new innovative that helps self-contained self-pacing and self-learning with minimum positive support of teacher.

**Table 5**

Analysis of Post-test scores obtained by the students taught by traditional method and co-operative method of school 'A'

| Group | Sample size | Mean | S.D. | Variance | t-value | Remarks |
|---|---|---|---|---|---|---|
| Controlled group | 10 | 12.5 | 2.15 | 4.65 | | |
| Experimental group | 10 | 17.5 | 1.28 | 1.65 | 2.16 | 2.16 > 2.101 |
| $t_{0.05, 18}$ = 2.101 | | | 0.05 level of significance | | | |

Table 5 shows that the mean score, standard deviation and variance obtained in post-test by controlled group of school 'A' was found to be 12.5, 2.15 and 4.65 respectively. Similarly, the mean score, standard deviation and variance obtained in post-test by experimental group was found to be 17.5, 1.28 and 1.65 respectively. The calculated t-value was found to be 2.16 which was greater than the tabulated t-value (t = 2.101) at 0.05 level of significance using two tailed test with degree of freedom 18.

This study showed that, the groups were significant difference between controlled group and experimental group students achievement in health and population on post-test. The difference between mean scores on post-test were due to the treatment provided to the both groups. The students of both groups were found to improve their performance. However, the students in experimental group taught with the co-operative teaching method, showed greater achievement than the students in controlled group taught with the traditional method. Hence, the null hypothesis was rejected and alternative hypothesis was accepted.

**Table 6**

Analysis of total scores in post-test score obtained by the students taught by traditional method and co-operative teaching method of both schools

| Group | Sample size | Mean | S.D. | Variance | t-value | Remarks |
|---|---|---|---|---|---|---|
| Controlled group | 20 | 12.75 | 1.84 | 3.39 | | |
| Experimental group | 20 | 18.40 | 2.10 | 4.44 | 2.53 | 2.53 > 2.02 |
| $t_{0.05, 38}$ = 2.02 | | | | 0.05 level of significance | | |

It can be observed from the Table 6 that posttest mean score, standard deviation and variance obtained by both the schools controlled group were 12.75, 1.84 and 3.39 respectively. Likewise experimental group involved in post-test respectively achieved 18.40, 2.10 and 4.44 mean score, standard deviation and variance. The computed t-value turned out to be 2.53> tabulated t-value (t = 2.02) at 0.05 level of significance (two tailed test) with degree of freedom 38. This study showed that, there was significant difference between total controlled group and total experimental group students' achievement in health and population on post-test The difference between mean scores on post-test was due to the treatment provided to the both groups. The students of both groups were found to improve their performance. However, the students in experimental group taught with the co-operative based method showed greater achievement than the students in controlled group taught with the traditional method. Hence, the null hypothesis was rejected and alternative hypothesis was accepted.

**Table 7**

Comparison of pre-test and post-test scores obtained by the students taught by traditional method of school 'A'

| Group | Sample size | Mean | S.D. | Variance | t-value | Remarks |
|---|---|---|---|---|---|---|
| Pre-test | 10 | 9.9 | 2.07 | 4.29 | 0.87 | 0.87 < 2.101 |
| Post-test | 10 | 12.5 | 2.15 | 4.65 | | |
| $t_{0.05, 18}$ = 2.101 | | | | 0.05 level of significance | | |

Table 7 shows that the mean score, standard deviation and variance obtained in pre-test by controlled group of school 'A' was found to be 9.9, 2.07 and 4.29 respectively. Similarly, the mean score, standard deviation and variance obtained in post-test by experimental group was found to be 12.5, 2.15 and 4.65 respectively. The calculated t-value was found to be 0.87 which was less than the tabulated t-value (t=2.101) at 0.05 level of significance using two tailed test with degree of freedom 18.

**Table 8**

Comparison between pre-test and post-test scores obtained by the treatment of co-operative method in both schools

| Group | Sample size | Mean | S.D. | Variance | t-value | Remarks |
|---|---|---|---|---|---|---|
| Pre-test | 20 | 10.75 | 1.70 | 2.89 | 3.67 | 3.67 > 2.02 |

| | | | | | |
|---|---|---|---|---|---|
| Post-test | 20 | 18.40 | 2.10 | 4.44 | |
| $t_{0.05, 38} = 2.02$ | | | | | 0.05 level of significance |

Table 8 shows the mean score, standard deviation and variance obtained in pre-test obtained of both school was found to be 10.75, 1.70 and 2.89 respectively. Similarly, the mean score, standard deviation and variance obtained in post-test obtained was found to be 18.40, 2.10 and 4.44 respectively. The calculated t-value was found to be 3.67 which was greater than the tabulated t-value (t=2.02) at 0.05 level of significance using two tailed test with degree of freedom 38.

**Discussion**

Analysis of the average means scores and percentage of the scores obtained by the controlled group and experimental group of both schools in pre-test showed that two groups were equivalent or homogeneous before the treatment. Analysis of mean scores between controlled group and experimental group in pre-test revealed that there was no significant difference between two groups in health and population achievement means. It is consistence with the work done by Roth (2022) who said that the pretest may have low power. Analysis of mean scores between controlled group and experimental group in pre-test in another school revealed that there was no significant difference between two groups in health and population achievement. It is similar with the study that pretest and post test before intervention is not difference (Acharya, 2019; Dankel & Loenneke, 2021; Chung & Tse, 2022; van Houwelingen et al., 2022). Analysis of mean scores between total controlled group total experimental group in pre-test of both school revealed that there was no significant difference between these two groups in health and population achievement. It means that perceiving capacity, and mental ability, understanding capacity and in depth knowledge of the two group's students in health and population was nearly same or equivalent before the treatment. This result is consistent that posttest result seems good after intervention in the schools (Chang et al., 2023; Gautam & Acharya, 2023; Martins et al., 2022; Sarker et al., 2022).

Analysis of the average mean scores and percentage of the scores obtained by the controlled group and experimental group in post-test showed that both traditional and experimental methods enhanced learning in health and population. From this analysis, it was found that experimental method helps the students to understand concepts of the health and population in easier and convenient way and consequently perform better in achievement than traditional teaching method. Analysis of mean scores between controlled group and experimental group in post-test of school `A' revealed that there was significant different two groups in health and population achievement. The experimental group taught by co-operative teaching method secured more marks and perform better than controlled group method. Analysis of mean scores between controlled group and experimental group in post-test of school 'B' revealed that there was significant difference between two groups in health and population, achievement. The experimental group taught by co-operative teaching method secured more marks and perform better than controlled group taught by

traditional method. Many studies show that the post test result in control group is improved (Acharya, 2024; Reimer et al., 2021; Stewart et al., 2021; Younis & Taher, 2023).

Comparison between mean scores of controlled group of the school `B' in pre-test and post-test taught traditional method showed that the post-test achievement was significantly better than that of pre-test. The difference in mean scores was due to the treatment provided to the controlled group. Thus, the use of traditional teaching method in health and population teaching helped students to learn better. Comparison between mean scores of experimental group of the school 'B' in pre-test and post-test taught by experimental method showed that the post-test achievement was significantly better than that of pre-test. The difference in mean scores was due to the treatment provided to the experimental group. Thus, the use of co-operative teaching method in health and population teaching helped students to learn better. Comparison between mean scores of total experimental group of both school in pre-test and post-test taught by experimental method showed that the post-test achievement was significantly better than that of pre-test. The difference in mean scores was due to the treatment provided to the experimental group. Thus the use of co-operative method in health and population teaching helped students to learn better. This result is consistent with many studies that controlled group in co-operative learning seems good (Acharya, Acharya & Magar, 2023; Ademuyiwa et al., 2023; Møgelvang & Nyléhn, 2023; Kumar et al., 2023).

The difference in mean scores was due to the treatment provided to the controlled group. Thus, the use of traditional method in health and population teaching helped students to learn better. From the analysis and interpretation of data, it was found that there was no significant difference between controlled group and experimental group in health and population was same before the treatment. Again, analysis and interpretation of pre-test and post-test mean scores of students in health and population taught by both traditional and co-operative methods revealed that there was significant difference in pre-test and post-test results. The post-test results were found to be better than pre-test results. It concluded that both traditional and co-operative methods were effective as well as fruitful in enhancing students learning outcomes in health and population that is also advocated by Møgelvang and Nyléhn, (2023). The mean achievement of the students taught by co-operative teaching method was significantly greater than the students taught by traditional method. This revealed that the co-operative teaching method was more effective traditional method of teaching health and population at secondary level (Wright & Manley, 2021). From the findings of the study, it was concluded that experimental method helps the students to understand health and population in easier, better, effective and convenient manner and consequently students , perform better in achievement in comparison to traditional method.

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