Uses, Benefits, and Challenges Encountered by Senior High School Science Teachers Using Collaborative Learning

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ABSTRACT

Collaborative learning aims at attracting interest and improving the performance of science students. A descriptive research method designed to identify uses, benefits, and challenges encountered by Senior High School Science Teachers using collaborative learning. Frequency count, mean and mean descriptors, Pearson r, and One-Way ANOVA are statistical tools used to analyze the collected data.

The age profile shows that the age of 31 to 40 is dominant. Most have a master's unit, with 6-10 years of science teaching, and attended relevant training at all levels (district, division, regional, national and international) 4 to 6 times. Moreover, collaborative learning activities are often used as perceived by respondents. The level of perception of Senior High School Science Teachers about achieving collective learning outcomes is very satisfactory. In addition, collaborative learning activities are of great benefit to the psychological and social aspects of learners. However, the challenges encountered by learners in carrying out joint learning activities in terms of student and school factors are severe.

Furthermore, there is no significant relationship between the extent of collaborative learning activities and their profile variables. Also, there is no significant difference in the level of perception of Senior High School Science Teachers regarding the achievement of collaborative learning outcomes across profile variables.

The result implies collaborative learning is an excellent pedagogy. Students can share many perspectives and develop superior thinking skills by assessing, appreciating, supporting, or opposing different views.

Keywords: Science, Science Teachers, collaborative learning, collaborative learning activities, collaborative learning outcomes

Introduction

Science is one of the fundamental subjects and highly valued by society for its infinite contribution to meeting basic human needs and improving living standards through science concepts. Science teaching is student preparation for life changes and challenges (Shamsudin, Abdullah & Yaamat, 2013).

According to the Next Generation Standards (NRC, 2000), "Science is the search for explanations about the natural world, and technology is a way to meet human needs, intellectual curiosity and aspirations". Therefore, Science Education should enable students to reflect on how science contributes to a productive society. Similarly, science as a subject should contribute to high-level critical thinking in a diverse student population. With this, the K-12 Science program aims to provide students with a repertoire that is a scientific, technological, eco-educated, and productive society.

Also, the K-12 Science Curriculum Guide (2013) highlights the understanding between science and everyday life; acquire an overview of the environment, scientific skills, attitudes, and promotes knowledge, skills and attitudes, values, and behaviors essential to the health of the individual, family, and community.

The concepts and skills taught through pedagogy allow students to improve their cognitive, emotional, and psychomotor domains (Montebon, 2014). Therefore, in Science Education, an in-depth learning approach is necessary and crucial for understanding complex concepts and processes. Understanding these concepts implies a process of conceptual change, a process that is primarily active in collaborative learning, in which students interact by explaining themselves critically and questioning themselves.

Because students have different previous knowledge, experience, and interests, they establish links to develop their conceptual training over time. Wilkinson, Soter, and Murphy (2010) reiterate the gradual release from the responsibility to a student-centered. To do this, active participation through social interaction will allow learners to take responsibility for their learning by becoming readers, writers, speakers, listeners, and thinkers in the classroom (Vacaa and Mraz 2011).

Teachers must respond efficiently and effectively to student need. Each teacher must explore an appropriate pedagogy. It must improve concept formation, inspire, and motivate students to learn to become successful students. Moreover, teachers need to create and formulate an attractive, productive, and skills development environment that integrates collective learning experiences through appropriate collaborative learning activities. Given these circumstances and scenarios, the study emerged.

The researcher seeks to discover the applications, benefits, and challenges that secondary science teachers face through collaborative learning to design the most policy interventions to maximize collaboration in the teaching/learning process.

Hence, this study sought to determine the uses, benefits, challenges encountered by Senior High School Science Teachers using collaborative learning. Specifically, it identified the: (a) respondent's profile in terms of: age; highest educational attainment, number of years of Science teaching, and number of relevant training attended; (b) extent of use of collaborative learning activities as perceived by the Senior High School Science Teachers, (c) level of perception of the Senior High School Science Teachers on the achievement of collaborative learning outcomes, (d) perceived benefits of the collaborative learning activities on learners in terms of the psychological and social aspects; (e)extent of challenges encountered by the learners as perceived by the Senior High School Science Teachers in carrying out collaborative learning activities in terms of student and school factors; (f) significant relationship between the extent of use of the collaborative learning activities and their profile variables; (g)significant difference in the level of perception of the Senior High School Science Teachers on the achievement of collaborative learning outcomes across profile variables.

Literature Review

Collaborative learning (CL) involves the collaborative intellectual effort of students and teachers. It represents a significant change from the environment that is typically teacher-centered or lesson-oriented in classrooms. A collaborative classroom is mainly on discussions with students and active work with course materials. Collaborative learning class teachers act as expert planners of students' intellectual experiences, as trainers or midwives of a more emerging learning process.

The Rokhaniyah study (2016) shows how collaborative learning has strengthened students' critical thinking and subsequently helps to discover the writing skills of students who have demonstrated analytically satisfactory results. Also, during her studies, Chandra (2015) gave positive comments to students and other teachers. It demonstrates student responsibility, active learning, positive interdependence that develops collaborative skills. Roselli's (2016) perspective on collaborative learning focuses on the results of collaboration, stressing that it deals mainly with the indirect application of group techniques and promoting the exchange and participation of each member to create shared knowledge.

Gonzales and Torres (2015) that after being exposed to CL, there is a significant improvement in high order thinking skills, especially to distinguish facts and opinions, because there is a way to provide explanations, logical inferences, and debates. The same perspective with Almajed (2015) on collaborative learning focuses on how students interact and get involved with questions, reasoning, and feedback. It leads to a better understanding associated with the

combination of new information with their prior knowledge. It allows a student to become participatory, committed, and confident.

Valdez et al. (2015) showed that 83% of respondents reported that CL's activities were motivating and inspiring. Sixty percent (60%) of them believed that this clarified their unrivaled ideas. With CL activities, students become more involved in learning by following their own pace and freedom of participation.

Also, Hurst et al. (2013) summarized the results of their study on how students learn the concept of collaboration by working with others through the output sheet. Data showed that students were encouraged to have different perspectives (24%) and effectively created a work environment (22%), critical thinking strengthened (21%), understanding and tenacity. He also highlighted the student's comments on collaborative learning. It helps them think more critically and learn beyond the topic.

Laal and Godsti (2012) briefly describe collaborative learning as an educational approach to teaching and learning. Groups of students work together to solve a problem, accomplish a task, and create a product. The result showed that the need to reflect and cooperate on critical issues has increased, resulting in stress from individual teamwork and community empowerment.

Bunce, Flens, et al. (2010) suggest that active learning methods can increase student attention, explain why students pay attention to CL activities. Likewise, a study by Cockrell et al. (2000) revealed that working together as a group member and that there is a change in leadership shows that each member can act as a leader on a key-in-hand basis. The dominant member who attempted to lead the group moves in the same direction as the members serve as mentors.

Summers and Volet (2010) suggest that students learn through co-regulation and co-building of knowledge with other group members to realize the benefits of learning, deeper understanding, and retention attributed to collaborative learning. Also, students are actively engaged. They have many opportunities to communicate with their peers, listen, present, and explain their ideas, exchange beliefs or divergent views, and explore intelligently the perspective of other people to use (Srinivas, 2011).

According to Gillies (2010), to minimize the challenges in collaborative learning, teachers need to play a role in facilitating effective collaboration among group members. Students need supervision to achieve a quality of output. The teacher must also be aware of their role as supervisors. Teachers must also set standards during the structuring phase so that a group can achieve common goals.

Collaborative learning can provide a broader perspective for each student to solve a problem, relevant experience around an actual demand. Students work together for meaningful and complete exploration, giving meaning and understanding to the world, learning the skills to analyze the synthesis of information, and apply them to solve current and future problems.

Methodology

This study used a descriptive research method to answer the problem statement. There are 180 Senior High School Science Teachers from the Second Congressional District of La Union. A sampling of the population was determined using the Krejcie & Morgan formula (1970). There were 123 Senior High School Science Teachers as the sample number of respondents. Only 100 or 81% of the questionnaires recovered due to the onset of COVID- 19.

An adapted questionnaire from Madriaga (2016) was used at the approval of the permit letter. Before the study, the letters of communication were provided; the letter of approval addressed to the Superintendent of the School Division (SDS) of the Union; the letter of consent to the School principal following the approval of the SDS; and the letter to the respondents attached to the questionnaire. Ethical issues have followed throughout the research process. The respondents used pseudonyms to ensure the confidentiality of their responses.

Data encoded in Microsoft Excel using Statistical Package for Social Sciences (SPSS) version 16. Appropriate statistical tools to treat the specific problems of this study which are: (a) frequency and percentage used for the profile of the respondents; (b) mean and descriptors used to determine the extent of use of collaborative learning activities as perceived by the Senior High School Science Teachers, the level of perception of the Senior High School Science Teachers on the achievement of collaborative learning outcomes, the perceived benefits of the collaborative learning activities on learners in terms of the psychological and social aspects, extent of challenges encountered by the learners perceived by the Senior High School Science Teachers in carrying out collaborative learning activities in terms of the student and school factors; (c) Pearson r to determine the significant relationship between the extent of use of collaborative learning activities and their profile variables; (d) One- Way ANOVA to determine the significant difference in the level of perception of the Senior High School Science Teachers on the achievement of collaborative learning outcomes across profile variables. Also, the Scheffe test to check paired significant variables. The manuscript subjected to grammar and plagiarism applications to improve and develop the study content.

Results and Discussion

Respondent's Profile

Table 1 shows the respondent's profile, out of 100 respondents, thirty- six (36) belong to the age group 31-40. Twenty-seven (27) respondents belong to the age group 41-50. Twenty-six (26) are between 20 and 30 years of age. Eleven (11) belong to the age group 51 and over. The majority of respondents are between the ages of 31 and 40.

Regarding the highest educational attainment, a more in-depth study of the table shows that only five (5) teachers are BS +16 to 36 professional units in education, thirty-seven (37) earned master's units, twenty - eight (28) academic requirements for a master's degree, sixteen (16) master's degrees, six (6) holders of doctoral units, four (4) doctorate degrees, and four (4) academic requirements for a doctorate.

The implications of these results for educational institutions, particularly science educators, will be used as vital information indicating that the respondents are equally competent in their field of specialization. They comply with the standards set out in Professional Standards for Teachers (PPST).

Table 1. Respondents Profile

Profile Variables	Variables Category	Frequency	Percentage
Age	20-30	26	26
	31-40	36	36
	41-50	27	27
	51 years and above	11	11
Highest Educational Attainment	BSE, BSIE, BSEEd	0	0
	BS +16 to 36 Professional units in Educ.	5	5
	MA Units	37	37
	MA Academic Requirements	28	28
	MAEd	16	16
	Doctoral Units	6	6
	Doctoral Academic Requirement	4	4
	Ed.D/Ph.D	4	4
Number of years of Science teaching;	1 - 5 years	15	15
	6 - 10 years	35	35
	11 - 15 years	21	21
	16 years and above	29	29
Relevant Trainings Attended (International)	3 and below	30	30
	4-6	57	57
	7- above	13	13
Relevant Trainings Attended (National)	3 and below	37	37
	4-6	49	49
	7- above	14	14
Relevant Trainings Attended (Regional)	3 and below	34	34
	4-6	50	50
	7- above	16	16

Relevant Trainings Attended (Division)	3 and below	14	14
	4-6	55	55
	7- above	31	31
Relevant Trainings Attended (District)	3 and below	7	7
	4-6	52	52
	7- above	41	41

Extent of Use of the Collaborative Learning Activities as perceived by the Senior High School Science Teachers

Table 2 highlights the extent of use of the collaborative learning activities perceived by respondents. Fifty (50) respondents always use "Think-Pair-Share". It has a weighted mean of 4.21, which shows that it is often used by the respondents. It also had the highest weighted mean of 4.40. The next in line is the use of peer editing.

Table 2. The extent of Use of the Collaborative Learning Activities as perceived by the Senior High School Science Teachers

INDICATORS	5		4		3		2		1		WM	DE
	f	%	f	%	f	%	f	%	f	%		
1. Think-Pair-Share	50	50	40	40	10	10	0	0	0	0	4.40	A
2. Round Table	36	36	42	42	17	17	5	5	0	0	4.09	O
3. Jigsaw	38	38	41	41	18	18	3	3	0	0	4.14	O
4. Concept Mapping	37	37	45	45	15	15	3	3	0	0	4.16	O
5. Buzz Groups	39	39	40	40	21	21	0	0	0	0	4.18	O
6. 3- Step Interview	30	30	48	48	19	19	3	3	0	0	4.05	O
7. Critical Debates	38	38	39	39	17	17	5	5	0	0	4.11	O
8. Note- Taking Pairs	41	41	40	40	16	16	3	3	0	0	4.19	O
9. Fishbowl	33	33	39	39	23	23	5	5	0	0	4.00	O
10. Role Play	31	31	41	41	23	23	5	5	0	0	3.98	O
11. Peer Editing	43	43	39	39	14	14	4	4	0	0	4.21	O
12. Collaborative Writing	34	34	41	41	22	22	2	2	0	0	4.06	O
13. Case Studies	14	14	41	41	22	22	3	3	0	0	4.06	O
14. Structure Problem Solving	33	33	42	42	20	20	5	5	0	0	4.03	O
15. Group Investigation	37	37	35	35	21	21	6	6	1	1	4.01	O
16. Word Webs	41	41	42	42	9	9	8	8	0	0	4.16	O
17. Paper Seminar	35	35	41	41	23	23	0	0	0	0	4.12	O
18. Scavenger Hunt	31	31	41	41	22	22	6	6	0	0	3.97	O
19. Team Games Tournament	35	35	40	40	21	21	4	4	0	0	4.07	O
20. Carousel Brainstorming	39	39	35	35	17	17	9	9	0	0	4.05	O
21. Speed sharing	38	38	41	41	18	18	3	3	0	0	4.14	O
22. TV Commercial/ Infomercial	36	36	39	39	20	20	5	5	0	0	4.06	O
23. Group Test/Group Grade	31	31	50	50	14	14	5	5	0	0	4.07	O

		F	%	F	%	F	%	F	%	F	%	WM	DE
24.	Human Tableau or Class Modeling	36	36	39	39	20	20	5	5	0	0	4.06	O
25.	Snowball Discussions	24	24	36	36	26	26	14	14	0	0	4.06	O
Overall Weighted Mean												**4.08**	**O**

Legend: *F= frequency*   *% - percentage*   *WM- Weighted Mean*

Mean Range   *Descriptive Equivalent (DE) For Overall Mean*
4.20-5.00   *Always (A)*
3.40-4.19   *Often (O)*
2.60 – 3.39   *Sometimes (S)*
1.80-2.59   *Seldom (S)*
1.00-1.79   *Never (N)*

On the other hand, the third in rank is the usage note-taking pairs with a weighted average of 4.19, classified as often use. In general, respondents often use collaborative learning activities with a weighted average of 4.08.

The implication of these findings in educational institutions, particularly to science educators, is evidence of the adequacy of science teachers with the teaching pedagogy of the twenty-first century. It also demonstrates that they can handle collaborative learning in their science classes.

Level of Perception of the Senior High School Science Teachers on the Achievement of Collaborative Learning Outcomes

Table 3 shows that the level of perception of the Senior High School Science teachers on the achievement of collaborative learning outcomes; first, the integration of the multimedia presentation for the class report corresponds to the outstanding learning output visibly achieved by Senior High School learners, as perceived by forty (41) or 41 percent of respondents with a weighted average of 4.29.

Moreover, from the table, conduct various campaigns on social issues such as drug addiction, cybercrime, environmental issues, and others; is outstandingly achieved by the Senior High School learners with thirty-nine (39) respondents that testify and have an average weighted average of 4.20, including the second in the ranking as collaborative learning outcomes achieved. A very satisfactory collaborative learning achieved by the learners of Senior High School, as shown by a weighted average of 4.07, is that they learn more when working as a group ranks third.

Table 3. Level of Perception of the Senior High School Science Teachers on the Achievement of Collaborative Learning Outcomes

INDICATORS	5		4		3		2		1		WM	DE
	f	%	f	%	f	%	f	%	f	%		
1. Conduct several campaigns on social issues such as drug addiction, cybercrime, environmental issues, and others.	39	39	45	45	13	13	3	3	0	0	4.20	O
2. Introduce case studies in class discussions.	30	30	46	46	19	19	5	5	0	0	4.01	VS
3. Create a creative collage.	26	26	42	42	28	28	4	4	0	0	3.9	VS
4. Capable of writing many compositions.	13	13	41	41	39	39	7	7	0	0	3.6	VS
5. Create creative brochures.	30	30	35	35	29	29	6	6	0	0	3.89	VS
6. Conduct research projects.	26	26	40	40	29	29	5	5	0	0	3.87	VS
7. Express views well, particularly during the debates.	16	16	34	34	35	35	15	15	0	0	3.51	VS
8. Capable of conducting interviews relevant to the discussions.	28	28	47	47	24	24	1	1	0	0	4.02	VS
9. Integrate the multimedia presentation for the class report.	41	41	45	45	12	12	0	0	0	0	4.29	O
10. Share ideas in the group discussions.	17	17	40	40	38	38	5	5	0	0	3.69	VS
11. Make a creative and meaningful presentation in the class/discussion report.	24	24	45	45	26	26	5	5	0	0	3.88	VS
12. Finish projects in a creative way.	33	33	44	44	18	18	5	5	0	0	4.05	VS
13. Take an active role in role-playing.	27	27	45	45	25	25	3	3	0	0	3.96	VS
14. Deliver speech effectively.	16	16	39	39	38	38	7	7	0	0	3.64	VS
15. Share stories with classmates about the given subject.	26	26	46	46	25	25	3	3	0	0	3.91	VS
16. Become a good listener.	24	24	46	46	27	27	3	3	0	0	3.91	VS
17. Solve problems with classmates.	35	35	37	37	26	26	2	2	0	0	4.05	VS
18. Participate in projects not only in school but also in the community.	13	13	39	39	37	37	11	11	0	0	3.54	VS
19. Practice leadership, decision-making, and conflict management skills.	14	14	35	35	38	38	13	13	0	0	3.50	VS
20. Learn more when working as a group.	35	35	39	39	24	24	2	2	0	0	4.07	VS
Overall Weighted Mean											**3.87**	**VS**

Legend: F= frequency   % - percentage   WM- Weighted mean

Mean Range *Descriptive Equivalent (DE) For Overall Mean*
4.20-5.00 *Outstanding*
3.40-4.19 *Very Satisfactory*
2.60 – 3.39 *Satisfactory*
1.80-2.59 *Poor*
1.00-1.79 *Very Poor*

The result also shows that collaborative learning activities are very satisfactory achieved by the learners having an overall weighted mean of 3.87. The implication of these findings in

educational institutions, particularly to science educators, is that they can use collaborative learning activities to incorporate in Science class. The result shows a promising learning outcome for learners.

Perceived Benefits of the Collaborative Learning Activities on Learners in terms of Psychological Aspect

Table 4 shows clearly how collaborative learning activities benefit learners' psychological aspects. First, is that the very great benefit of collaborative learning activities develops mutual responsibility, as indicated by a weighted average of 4.22. Then, as a great benefit, a positive attitude toward others showing an average weighted mean of 4.18. In addition, it raises the student's self-esteem with an average weighted mean of 4.07 is considered to be of great benefit and ranks third. In general, collaborative learning in the psychological aspect shows great benefit to the Senior High School learners with an overall weighted mean of 4.01

Table 4. Perceived Benefits of the Collaborative Learning Activities on Learners in terms of the Psychological Aspect

INDICATORS	5		4		3		2		1		WM	DE
	f	%	f	%	f	%	f	%	f	%		
1. Raise the student's self-esteem.	31	31	46	46	22	22	1	1	0	0	4.07	GB
2. Collaboration reduces anxiety.	30	30	40	40	26	26	4	4	0	0	3.96	GB
3. Develop a positive attitude towards others.	36	36	46	46	18	18	0	0	0	0	4.18	GB
4. Develop mutual responsibility for each other.	40	40	42	42	18	18	0	0	0	0	4.22	VGB
5. Promote understanding of diversity for others.	39	39	25	25	28	28	8	8	0	0	3.95	GB
6. Develop a heterogeneous positive relationship.	24	24	54	54	19	19	3	3	0	0	3.99	GB
7. Set high expectations of learning outcomes.	25	25	39	39	33	33	3	3	0	0	3.86	GB
8. Teach learners to critique ideas, not people.	32	32	34	34	30	30	4	4	0	0	3.94	GB
9. Stay on task more and less disruptively.	31	31	42	42	27	27	0	0	0	0	4.01	GB
10. Increase the self-confidence of students.	32	32	37	37	26	26	5	5	0	0	3.96	GB
Overall Weighted Mean											**4.01**	**GB**

Legend: *F= frequency*   *% - percentage*   *WM- Weighted Mean*

Mean Range	*Descriptive Equivalent (DE) for Overall Mean*
4.20-5.00	*Very Great benefit (VGB)*
3.40-4.19	*Great benefit (GB)*
2.60 – 3.39	*Moderate benefit (MB)*
1.80-2.59	*Slight benefit (SB)*
1.00-1.79	*Not all (NA)*

The implication of these results in educational institutions, especially for science educators, is that it can be a basis in integrating collaborative learning into science classes. This may be a way to help students develop holistically.

Perceived Benefits of the Collaborative Learning Activities on Learners in terms of the Social Aspect

Table 5 shows the perceived benefits of the collaborative learning activities on learners in terms of the social aspect. The number one rank as a very great benefit of collaborative learning activities to the learner's social aspect is the development of unity and teamwork with an average weighted mean of 4.25. Secondly, a great benefit to the learner's social aspect is it creates an atmosphere that shapes and practices collaboration showing an average weighted mean of 4.16. The third benefit for the learner's social aspect is it develops interpersonal relationships having a weighted mean of 4.11

In conclusion, collaborative learning activities are of great benefit to the learner's social aspect as perceived by respondents showing an overall weighted mean of 4.00.

Table 5. Perceived Benefits of the Collaborative Learning Activities on Learners in terms of the Social Aspect

INDICATORS	5		4		3		2		1		WM	DE
	f	%	f	%	f	%	f	%	f	%		
1. Develop a system of social support.	30	30	41	41	26	26	26	26	0	0	4.04	GB
2. Develop learning communities.	42	42	42	42	15	15	15	15	0	0	3.98	GB
3. Development of unity and teamwork.	26	26	48	48	23	23	23	23	0	0	4.25	VGB
4. Develop skills in social interaction.	36	36	39	39	25	25	25	25	0	0	3.97	GB
5. Develop interpersonal relationships.	18	18	50	50	31	31	31	31	0	0	4.11	GB
6. Build an understanding of the diversity between students and teachers.	33	33	50	50	17	17	17	17	0	0	3.85	GB
7. Create an atmosphere that shape and practice collaboration.	30	30	41	41	26	26	26	26	0	0	4.16	GB

											WM	DE
8.	Positive social responses to problems.	25	25	34	34	32	34	9	9	0	0	3.75	GB
9.	Provide an enabling environment to manage conflict resolution.	25	25	41	41	26	41	8	8	0	0	3.83	GB
10.	Create an active, engaged, and exploratory learning environment.	35	35	42	42	21	42	2	2	0	0	4.10	GB
Overall Weighted Mean												**4.00**	**GB**

Legend: F= frequency   % - percentage   WM- Weighted mean
Mean Range   Descriptive Equivalent (DE) Overall Mean
4.20-5.00   Very Great benefit (VGB)
3.40-4.19   Great benefit (GB)
2.60 – 3.39   Moderate benefit (MB)
1.80-2.59   Slight benefit (SB)
1.00-1.79   Not all (NA)

The implications of these results for educational institutions, particularly for science educators, can be an avenue to consider collaborative learning in science classes. It will also be a way of understanding the learning styles of twenty-first-century learners. Likewise will lead to the preparation of teaching plans and teaching material using collaborative learning.

Extent of Challenges Encountered by the Learners as perceived by the Senior High School Science Teachers in Carrying Out Collaborative Learning Activities in terms of Student Factors

As shown in Table 6, a very highly serious challenge encountered by the learners in carrying out collaborative learning activities student factor is the conflict between group members having a weighted mean of with a weighted mean of 4.26. Thirty-seven (37) respondents testified to the result. Second, a highly serious challenge encountered by the learners is the inability to cope with the lesson due to lack of understanding, as shown with the weighted mean of 4.13. Furthermore, third in rank as highly serious challenge encountered by the learners is being intimidated by group members having a weighted mean of 4.08.

Overall, the student factor challenges encountered by the learners as perceived by the Senior High School Science Teachers in carrying out collaborative learning activities is highly serious, having an overall weighted mean of 3.96.

Table 6. Extent of Challenges Encountered by the Learners as perceived by the Senior High School Science Teachers in Carrying Out Collaborative Learning Activities in terms of Student Factor

INDICATORS	5		4		3		2		1		WM	DE
	f	%	f	%	f	%	f	%	f	%		
1. Inability to participate in the presentation in class.	29	29	40	40	23	23	8	8	0	0	3.90	HS
2. Lack of attention during the explanation.	25	25	49	49	19	19	7	7	0	0	3.95	HS
3. Resistant to collaborative learning activities	23	23	39	39	32	32	6	6	0	0	3.79	HS
4. Keep passive and isolated during group conversations.	25	25	43	43	23	23	8	8	1	1	3.83	HS
5. Inability to cope with the lesson due to lack of understanding.	36	36	44	44	17	17	3	3	0	0	4.13	HS
6. Conflicts between group members.	37	37	52	52	11	11	0	0	0	0	4.26	VHS
7. Ignore the teacher's instructions, commands, and comments.	28	28	42	42	28	28	2	2	0	0	3.96	HS
8. Being intimidated by group members.	31	31	48	48	19	19	2	2	0	0	4.08	HS
9. Non-compliance with the activities.	17	17	47	47	33	33	3	3	0	0	3.78	HS
10. Difficulty expressing opinions in class.	28	28	38	38	27	27	7	7	0	0	3.87	HS
Overall Weighted Mean											**3.96**	**HS**

Legend: F= frequency   % - percentage   WM- Weighted Mean

Mean Range	Descriptive Equivalent (DE) for Overall Mean
4.20-5.00	Very Highly Serious (VGS)
3.40-4.19	Highly Serious (HS)
2.60 – 3.39	Moderately Serious (MS)
1.80-2.59	Slight Serious (SS)
1.00-1.79	Not Serious (NA)

The implications of these results for educational institutions, especially for science educators, can lead to an understanding of the students' current attitude towards others through collaborative learning in science classes. It will lead to consideration in the management of science classes that promote respect, acceptance, and understanding of one another.

Extent of Challenges Encountered by the Learners as perceived by the Senior High School Science Teachers in Carrying Out Collaborative Learning Activities in terms of School Factors

Table 7 highlights the extent of challenges encountered by the learners as perceived by the Senior High School Science Teachers in carrying out collaborative learning activities in terms of school factors. As shown in the table, the foremost very highly serious school factor challenge

encountered by students with an average weighted mean of 4.38 is having an overcrowded class with the student. Lack of appropriate activities for students at different levels with a weighted mean of 4.09 ranks second. Learner's having different learning area activities with a weighted mean of 4.02 is considered the third highly serious school factor challenge encountered by students as respondents perceived in carrying out collaborative learning activities.

In general, as shown by the overall weighted mean of 3.93 shows that the school factors challenges encountered by the learners as perceived by the respondents in carrying out collaborative learning activities are highly serious.

Table 7. Extent of Challenges Encountered by the Learners as perceived by the Senior High School Science Teachers in Carrying Out Collaborative Learning Activities in terms of School Factor

INDICATORS	5		4		3		2		1		WM	DE
	f	%	f	%	f	%	f	%	f	%		
1. Lack of teaching materials prepared for use in class.	27	27	52	52	15	15	6	6	0	0	4.00	HS
2. A time limit in class for completing the activity.	31	31	36	36	26	26	7	7	0	0	3.91	HS
3. Class overcrowded with the student.	47	47	45	45	7	7	1	1	0	0	4.38	VHS
4. Different learning areas activities.	30	30	44	44	26	26	0	0	0	0	4.02	HS
5. Lack of excitement in-class activities.	23	23	48	48	26	26	3	3	0	0	3.91	HS
6. Material facilities needed at the school are not available.	21	21	45	45	31	31	3	3	0	0	3.84	HS
7. Lack of appropriate activities for students at different levels.	30	30	49	49	21	21	0	0	0	0	4.09	HS
8. Overlapping thematic activities.	27	27	31	31	35	35	7	7	0	0	3.78	HS
9. Participation in extracurricular activities requires time.	14	14	47	47	31	31	8	9	0	0	3.67	HS
10. Lack of ventilation in the classroom and space for group activities.	20	20	41	41	30	30	9	9	0	0	3.72	HS
Overall Weighted Mean											**3.93**	**HS**

Legend: F= frequency   % - percentage   WM- Weighted Mean

Mean Range	Descriptive Equivalent (DE) for Overall Mean
4.20-5.00	Very Highly Serious (VGS)
3.40-4.19	Highly Serious (HS)
2.60 – 3.39	Moderately Serious (MS)
1.80-2.59	Slight Serious (SS)

| 1.00-1.79 | Not Serious (NA) |

The implications of these results for educational institutions, especially for science educators, will lead to the formulation of necessary school interventions to reduce school-related factors to successfully integrate collaborative learning into science classes.

Significant Relationships between the Extent of Use of the Collaborative Learning Activities and their Profile Variables

Table 8 presents the Pearson's r showing a significant relationship in the extent of use of the collaborative learning activities perceived by Senior High School Science Teachers and their profile variables. There is no significant relationship between the extent of use of collaborative learning activities perceived by Senior High School Science Teachers and their profile variables. The result shows a higher significance value of 0.05 seen in the following results 0.609, 0.614, 0.614, 0.874, 0.947, 0.546, 0.890 and 0.734 respectively.

Therefore, the null hypothesis between the extent of use of collaborative learning activities and their profile variables is accepted.

Table 8. Pearson r Showing Significant Relationship in the Extent of Use of the Collaborative Learning Activities as perceived by the Senior High School Science Teachers and their Profile Variables

Paired Samples Correlations					
	Paired Samples	N	Correlation	Sig.	Remarks
Pair 1	Age Profile & Extent of Use of Collaborative Learning Activities as perceived by SHS Science Teachers	100	-.052	0.609	NS
Pair 2	Highest Educational Attainment & Extent of Use of Collaborative Learning Activities as perceived by SHS Science teachers	100	-.051	0.614	NS
Pair 3	Number of Years Science teaching & Extent of Use of Collaborative Learning Activities as perceived by SHS Science Teachers	100	-.073	0.614	NS
Pair 4	Number of Relevant Training Attended in District level & Extent of Use of Collaborative Learning Activities as perceived by SHS Science Teachers	100	.016	0.874	NS
Pair 5	Number of Relevant Training Attended in Division level & Extent of Use of Collaborative Learning Activities as perceived by SHS Science Teachers	100	-.007	0.947	NS
Pair 6	Number of Relevant Training Attended in Regional level & Extent of Use of Collaborative Learning Activities as perceived by SHS Science Teachers	100	-.061	0.546	NS
Pair 7	Number of Relevant Training Attended in National level & Extent of Use of Collaborative Learning Activities as perceived by SHS Science Teachers	100	.014	0.890	NS
Pair 8	Number of Relevant Training Attended in International level & Extent of Use of Collaborative Learning Activities as perceived by SHS Science Teachers	100	-.034	0.734	NS

Interpretation

➢ If the significant value is less than *α=0.05, then there is a significant relationship (S)*

➢ *If the significant value is greater than α=0.05, then there is no significant relationship (NS)*

The implications of these results for educational institutions will be used as vital information showing that each science educators' respondents, regardless of their age, highest educational attainment, teaching experience, or relevant training are competent in their own way.

Moreover, the result is an attestation that the respondents are professionally aligned and committed to skills development to various educational pedagogy, particularly collaborative learning.

Significant Difference in the Level of Perception of the Senior High School Science Teachers on the Achievement of Collaborative Learning Outcomes across Profile Variables

Table 9 presents the results of One-Way ANOVA to determine whether there is a significant difference in the level of perception of Senior High School Science teachers on the achievement of collaborative learning outcomes across profile variables.

There is no significant difference in the level of perception of Senior High School Science Teachers on the achievement of collaborative learning outcomes across their profile variables, having significant values of 0.426, 0.124, 0.741, and 0.876, respectively.

Therefore, the null hypothesis is accepted. The teacher's profile does not affect the perception of Senior High School Science teachers on the achievement of collaborative learning outcomes.

Table 9. One –Way ANOVA Showing Significant Difference on the Level of Perception of the Senior High School Science Teachers on the Achievement of Collaborative Learning Outcomes across Profile Variables

Variable		Sum of Squares	df	Mean Square	F	Sig.
Age						
	Between Groups	49.729	3	16.576	.938	.426
	Within Groups	1697.261	96	17.680		
	Total	1746.990	99			
Highest Educational Attainment						
	Between Groups	174.704	6	29.117	1.722	.124
	Within Groups	1572.286	93	16.906		
	Total	1746.990	99			
Numbers of Years Science teaching						
	Between Groups	22.511	3	7.504	.418	.741
	Within Groups	1724.479	96	17.963		
	Total	1746.990	99			
Relevant Trainings Attended						
	Between Groups	68.902	8	8.613	.467	.876
	Within Groups	1678.088	91	18.441		
	Total	1746.990	99			

Interpretation
➢ If the significant value is less than $\alpha=0.05$, then there is a significant difference (S)
➢ *If the significant value is greater than $\alpha=0.05$, then there is no significant difference (NS)*

The implications of these results in educational institutions will be a confirmation that each teacher is effective in the field of education and can handle the latest pedagogy, regardless of his or her profile and qualifications. It will also serve as the primary basis for respect for the diversity of teachers according to their individuality, experience, and profiles.

Conclusions

Based on the findings of the study, the following conclusions are drawn; teacher respondents are matured and highly capable of handling the task, duties and even challenges demanded in their teaching job. Teacher respondents are ready and capable to employ collaborative learning activities but still need to improve techniques and approaches to further maximize the application of collaborative activities. The use of collaborative learning among Science Teachers shows greater achievement and outcomes among learners. The use of collaborative learning activities showed beneficial effects among learners in terms of the psychological and social aspects. The challenges encountered by the learners in using various collaborative activities should be given attention so that learners will gradually learn to embrace and enjoy the benefits of collaborative learning.

References

Almajed, A., Skinner, V., Winning, T. A., and Peterson, R.F. (2016). Collaborative Learning: Students' Perspectives on How Learning Happen. April 2016. Interdisciplinary Journal of Problem-based Learning 10(2). DOI: 10.7771/1541-5015.1601.

Bunce, D., Flens, E., & Nieles, K. (2010). How long can students pay attention in class? A study of students attention decline using clickers. Journal of Chemical Education, 87(12), 1438-1443).

Chandra, R. (2015). Collaborative Learning for Educational Achievement. March 2015. International Journal of Research & Method in Education.

Cockrell, K. S., Caplow, J., and Donaldson, J (2000). Context for Learning: Collaborative Groups in the Problem-Based Learning Environment. January 2000. Review of Higher Education, The 23(3). DOI: 10.1353/rhe.2000.0008.

Gillies, R. M., & Boyle, M. (2010). Teachers' Reflections on Cooperative Learning: Issues of Implementation. Teaching and Teacher Education, 26(4), 933-940.

Gonzales, W. D. W., & Torres, P. (2015). Looking at CIRC through quantitative lenses: Can it improve the reading comprehension of Filipino ESL learners? Philippine ESL Journal, 15, 67-98).

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Hurst, W, R and Nixon, S (2013). The Impact of Social Interaction on Student Learning. Missouri State University. Retrievedfrom:https://scholarworks.wmich.edu/cgi/viewcontent.cgi?article=3105&context=reading_horizons.

Krejcie R.V. and Morgan D.W. (1970). Determining Sample Size for Research Activities.

Laal, M., & Ghodsi, S.M. (2012). Benefits of collaborative learning. Journal of Procedia-Social and Behavioral Sciences, 31, 486-490.

Madriaga, C (2016) Collaborative learning activities and outputs in Mathematics of Grade 11 students. (Unpublished master's thesis). Polytechnic College of La Union Graduate Studies, Agoo, La Union.

Montebon (2014). (K12 Science Program in the Philippines: Student Perception on its Implementation By: Prof. Darryl Roy T. Montebon Faculty, Institute of Teaching and Learning Philippine Normal University).

NRC (National Research Council) (2000). Inquiry and the national science education standards. Washington, DC: National Academy Press.)

Official Gazette of the Republic of the Philippines (n.d.). The K to 12 basic education program. Retrieved from: Officialgazette.gov.ph/k-12.

Rokhaniyah, H. (2016).The Implementation of Collaborative Learning to Enhance the Students' Critical Thinking In Writing. Volume 11, No. 1. Retrieved, from: DOI: http://dx.doi.org/10.21111/at-tadib.v11i1.627.

Roselli, N.D. (2016). Collaborative learning: Theoretical foundations and applicable strategies to university. ISSN 2307-7999, e-ISSN 2310-4635. Retrieved from; https://files.eric.ed.gov/fulltext/EJ1126307.pdf.

Shamsudin, N. M., Abdullah, N. & Yaamat, N. (2013). Strategies of teaching science using an inquiry based science education (IBSE) by novice chemistry teachers. Procedia - Social and Behavioral Sciences, 90, 583-592 http://dx.doi.org/10.1016/j.sbspro.2013.07.129

Srinivas, H. (2011 Oct. 21, last updated).What is Collaborative Learning? The Global Development Research Center, Kobe; Japan . Retrieved 20 Dec. 2011, from: http://www.gdrc.org/kmgmt/c-learn/index.html.

Summers, M., & Volet, S. (2010). Group work does not necessarily equal collaborative learning: Evidence from observations and self-reports. European Journal of Psychology of Education. 25, 473-492.)

Vacca, R.T., Vacca, J.L., & Mraz, M. (2011). Content area reading: Literacy and learning across the curriculum (10th ed.). Boston: Pearson.

Wilkinson, I. A. G., Soter, A. O., & Murphy, P. K. (2010). Developing a model of Quality Talk about literary text. In M. G. McKeown & L. Kucan (Eds.), Bringing reading research to life (pp. 142–169). NY: Guilford Press.

Valdez, A., Lomoljo, A., Dumrang, S., & Didatar, M. (2015). Developing critical thinking through activity –based and Cooperative Learning Approach in teaching high school chemistry. International Journal of Social Science and Humanity, 5(1), 139-141.