

Collaborative Skills of Pre-Service Teachers

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This paper analyzed students' perception of collaborative skills. Students were asked which areas on collaborative skills they needed improvement on and the challenges they had experienced in working with others. One hundred forty-seven first year students from the pre-service teachers' program with majors in mathematics and physical sciences were selected as the participants of the study using the purposive sampling method. A questionnaire was used for data collection. This study applied the descriptive research design. Results of the study indicated that students developed some aspects of collaboration but there was an area needing enhancement. The collaboration skills developed among students were being sensitive in taking opinions from others, working in a positive environment, giving positive to one another in order to improve as a group, acknowledging the works of others with compliments, and understanding other's point of view. The area needing improvement were on communication and interaction skills in order to motivate other members to share their thoughts and ideas.

Keywords: Pre-service teachers' perceptions; students' collaboration, 21st century skills, collaborative skills

Introduction

The adage, "two heads are better than one," succinctly fits the meaning of collaboration. One term associated with collaboration is group interaction. In fact, group interaction is needed in learning mathematics and chemistry. Hmelo-Silver (2004) emphasized the benefit of collaboration as the building of knowledge very relevant to problem-based learning.

Many students find chemistry as a difficult subject aside from mathematics. Most of the learning difficulties include how students' views contradict with chemistry concepts thus leading to misunderstanding. Students have difficulty comprehending chemical explanations (Treagust, Duit, & Nieswandt, 2016). Their inability to understand the fundamental concepts of chemistry is a big challenge (Ali,

2012). Oftentimes, students are not interested to learn the subject due to its abstract and analytical concepts. They feel bored especially that concepts learned are not applicable to real-life situations. Supposedly, this problem can be minimized if students collaborate with their peers. Consequently, collaborative skills of students affect their learning in chemistry (Lew, Mesch, Johnson, & Johnson, 1986).

All experiments and group activities in the chemistry courses require collaborative skills of students to be able to demonstrate the ability to work effectively and respectfully with diverse teams and be able to exercise flexibility and willingness to help others. Students work collaboratively especially in solving problems to enhance their learning (Hmelo-Silver, 2004).

However, problems are always encountered in a group activity since students have different personalities and attitudes (Bednarz, 2012). Some students are not confident to express themselves since they think that their peers are better than they are (University of Queensland, 2017). They allow their classmates to do the tasks thinking that their peers are more capable than themselves. They do not have the motivation to share their ideas during a discussion and cooperate in group problem-solving. This usually happens in laboratory activities where some of the group mates fail to cooperate that can cause low ratings on their output (Hofstein & Kipnis, 2004). The problems can be prevented supposedly if they have developed the skills on how to interact with their group mates.

Another problem is the presence of domineering or over-confident students who overrule their classmates during a group workshop. They dominate the discussion, and they insist that their ideas should be followed. They fail to listen to their classmates' ideas. They underestimate the capability of their classmates that they usually reject the ideas presented. This inhibits unity and cooperation among the members of the group (Bednarz, 2012).

In addition to the problem, students do not see the relevance of group work and feel that the objectives are not clear (UNSW Teaching, 2015). This should be the lookout of the teacher to give an orientation to the students before allowing them to do the group activity. But sometimes teachers fail in this area since they think that students have developed their collaborative skills in their lower years. This may lead to mediocre outcome in the group activity.

Students who are concerned about their group members' English language abilities are also a problem (UNSW Teaching, 2015). Sometimes this is the concern of the group leader who thinks that group mates who cannot express themselves with correct grammar and inadequate language facility should not

be given the chance to give their idea. So the group leader does most of the talking and the tasks. These leaders forget that collaboration is important to achieve a better output. They fail to use collaboration in working with another person or group to achieve or do something (Graham, 2001). Collaboration is helping one another to achieve a common goal (Vincent, 2017). Peer learning or peer instruction is needed to learn better in a difficult subject like chemistry (Sirhan, 2007; Wilson & Arendale, 2011; Cornell University Center for Teaching Innovation, 2017). Vincent (2017) emphasized the complication of learning collaboration skills since they are built-in skills of people. But these skills can be learned by practice and with guidance. This is where the teacher's roles of teaching and showing examples of collaboration skills are relevant.

Another problem associated with group work is the inability to focus on a task (The University of Queensland, 2017). Students' diverse ideas may cause a problem of focusing on a task since many of the students believe that their ideas are the only right ones. Some will demand that their suggestion should be followed. This problem sometimes causes misunderstanding in the group and relationships are affected if not properly handled. The disagreement that crop up during group work may lead to contention but may be avoided if the teacher effectively facilitates group work.

Bednarz (2012) suggested strategies and solutions for solving team problems. A good team first learns to work together. The teacher gives time to teach the students the art of unity. The group is committed to each other regardless of their personal differences. The common quotation "in unity we stand" should be the group's goal to be successful and achieve the task they are assigned to do.

Leaders need to deal with team needs. They must listen to the members' ideas and suggestions and make the right decision by considering the members' suggestions.

Although pressures arise due to personal differences, but leaders can choose to be perceptive and considerate in dealing with the group. Addressing these issues is as important as the team's task of making organizational improvements. Often both leaders and team members underestimate the need to develop among themselves to be cohesive.

Group mates are handled wisely so that there is a smooth relationship between leaders and members. With this, trust and understanding will be developed as the primary goal. Internal relationships among the group is important since failure to build relationships creates division, and efforts are wasted.

Leaders need to understand that the more they know what to expect as their teams progress, the better equipped they are to handle difficulties and problems as they arise. This knowledge enables leaders to recognize many problems and work through the ones that cannot be avoided.

Moreover, teachers must be concerned with the collaborative skills of the students. They should give clear instructions to the group especially to the leader. Their listening skills should be developed and enhanced since it is important in every group activity. Participating and cooperating with group mates may be included in the criteria in grading outputs. Teacher's strategies and practices that promote student elaboration of ideas can help develop their collaborative skills (Webb, 2009).

Feelings of anxiety and apprehension among the group members must be addressed by the teacher and leaders. Discrimination should not be experienced among group members as this can inhibit the group's effectiveness in achieving a task. This can be addressed if the teacher will structure the group task to each individual and assigned leaders facilitate the members' participation. Leaders should involve every individual in a group to build understanding and support (Bednarz, 2012).

Bernardz (2012) enumerated qualities needed for collaboration: Membership inclusion. This will boost the self-esteem of members thereby developing confidence. In fact, each person wants to be included in every group activity. For this reason, leaders should include every member by assigning a task. By doing so, unity will be developed and tasks will be accomplished. Thus, team-building is enhanced in the group other qualities include: influence, control, and mutual trust. For collaboration to succeed, a leader show a good example in the area of trust. They trust their members and these members also trust them. Mutual trust is not obtained until individuals begin to work together and become familiar with each other's personality differences. Another quality is mutual loyalty. This is shown when there is a mutual trust among the members and between the members and the leader. In order to develop this, humility is practiced and a domineering attitude is avoided.

There were studies that apply collaboration tools in learning science and mathematics. The study of Lazakidou and Retalis (2009) used the Synergo tool accompanied by a computer-supported collaborative learning tool through which significant results on the problem-solving skills of the pupils were enhanced in learning mathematics.

Similarly, the study of Lew et al. (1986) focused on the use of collaborative skills and showed increased achievement on students' performance. They found that positive goal interdependence with both collaborative skills and academic group contingencies promoted the most positive relationships with non-handicapped classmates, achieved most frequent engagement in cooperative skills, and attained the highest achievement.

With the above framework and studies cited, this paper investigated the collaborative skills of pre-service teachers. It determined the areas that need improvement as well as the concerns or problems on collaborative learning

specifically in mathematics and chemistry.

Methodology

The study used a quantitative method to collect the information about students' perception on collaborative skills. A survey questionnaire was used in this descriptive research. This study presented students' perceptions of the collaborative skills at one of the institutions in Cagayan de Oro City, Philippines. One hundred forty-seven pre-service teachers with mathematics and physical sciences majors were selected by using purposive sampling method. The students were asked about the areas they needed improvement and the challenges they experienced in working with others. The questionnaire used a three-point Likert-type. There were 12 items in this instrument.

Results and Discussion

Presentations of the results on pre-service teachers' collaborative skills are shown in Tables 1 and 2.

	Mean	sd
1. Taking differences of opinion personally	3.1088	.92254
2. Maintaining a sense of humor	2.9252	.84471
3. Focusing on the issue and not attacking the person	2.8980	.87378
4. Adjusting to the time restraints	2.8912	.86902
5. Common points of agreement	2.8163	.74042
6. I understand what my classmate is sharing	2.7619	.76152
7. Thinking before speaking	2.6599	.96866
8. Listening to what others say	2.5918	.72862
9. Complementing others of a good work	2.5782	.71121
10. Comfortable with different points of view	2.5374	.87798
11. Asking groupmates to elaborate the points they raised	2.4694	.97437
12. Asking questions that encourage members to share their thoughts	2.3537	.74762

Table 1 shows the mean and standard deviation of the students' perceptions on collaborative skills. The highest mean value of 3.1088 is "taking differences of opinion personally" which means that students are psychologically sensitive especially in their capability of giving opinions and suggestions. The second highest mean value of 2.9252 is "maintaining a sense of humor" that implies students are motivated to participate in an exciting atmosphere allowing them to enjoy working with the group. The third highest mean value of 2.8980 is on "focusing on the issue and not attacking the person" implying that students are interested to discuss the issue and/or task assigned and choose to set aside their personal agenda that may cause chaos and affect their group output. These are connected to the findings of Loh and Teo (2016) that emphasized that learning collaboratively demands responsibility, persistence, and sensitivity in which everyone should participate.

On the other hand, the lowest mean value of 2.3537 is "asking questions that encourage members to share their thoughts." This implies that sharing of thoughts and ideas is given little value in the group. This situation occurs when there is no teamwork and openness due to lack of communication. This is consistent with one of the common issues mentioned in the study of UNSW Teaching (2015) that groups do not go along well and are not listening to each other.

Table 2. Summary of Results of the Students' Perception of Collaborative Skills

Questions	I have difficulty with this	I do this reasonably well	I see this as my strength
1. Looking for common points of agreement	34.0	46.3	18.4
2. Listening deeply to what others are saying	44.9	40.8	10.9
3. Checking to see if I understand what my classmate	31.3	49.0	15.6

is sharing or suggesting			
4. Complementing others of a good work done for the group	34.7	52.4	6.1
5. Thinking before speaking	30.6	34.0	22.4
6. Being comfortable with different point-of-view	35.4	38.8	13.6
7. Asking groupmates to tell me more or to elaborate on their points raised	32.7	32.7	16.3
8. Asking question that encourages my groupmates to share their thoughts	48.3	35.4	5.4
9. Taking differences of opinion personally	15.0	36.7	40.8
10. Focusing on the issue and not attacking the person	27.2	39.5	27.9
11. Adjusting to the time restraints of others	25.2	42.2	26.5
12. Maintaining a sense of humor, even when the group is having difficulty with the task	25.2	42.9	27.2

Table 2 shows the students' perceptions on collaborative skills in which they answered "I do this reasonably well" with the highest percentage on item 4 (52.4%) which means that most of the group members are looking forward to receiving a compliment of every good work done. This is followed by item 3 (49.0%) which emphasizes that every member is eager to understand what a group mate is sharing or suggesting. The third highest percentage is on item number 1 (46.3%) which indicates that group members look for common points of agreement. These aspects that are mentioned like complimenting on a work done, eagerness to understand other's ideas, and finding common points to agree are essential in collaboration. These students believed that these items can enhance in the development of collaboration. These findings are supported by the study of Novitasari (2019) who concluded that collaborative learning allows the learners to work together in solving

problems, getting meaningful feedbacks, and triggering confidence that help them to practice speaking.

On the other hand, students also were able to answer the question, "I see this as my strength" in item 9 with the highest percentage (40.8%). This emphasizes the students' acceptance to the different personal opinions. This is followed by item 10 (27.9%) that indicates that students give importance to their tasks rather than be critical of others. Lastly, item 12 (27.2%) shows that the students had fun in doing their tasks. These are good qualities that the students must develop to enhance collaboration. This is consistent with the study of Gleeson, McDonald, and Williams (2007) who concluded that unity and team work is important in collaboration.

Lastly, the students were able to answer the question, "I have difficulty with this" with the highest percentage on item 8 (48.3%) which means that students were hesitant to ask questions from their groupmates' ideas or thoughts. Another one is item 2 (44.9%) where students were not able show their interests in listening when their classmate is talking. Thirdly, item number 6 (35.4%) indicated that the students have apprehension with their groupmates' ideas. All of the mentioned difficulties can hinder students' engagement and prevent collaboration to be developed. Thus, improving communication is necessary in collaboration. This was mentioned on the study of Gleeson et al. (2007) which concluded that recognizing other's views and be open to others affect collaborative learning. The study of Le et al. (2018) mentioned that one of the obstacles on collaborative learning is the lack of collaborative skills and that includes group interaction.

Conclusion

Based on the findings, pre-service students have already developed their collaboration skills but there are still areas that need to be enhanced. The students were sensitive in taking opinions

from others, able to receive critique of each other's works in order to improve as a group. It also showed that students acknowledge the works of others with gestures of compliment. Also, understanding other's point of view in delivering their suggestions were practiced by the students. Although the students manifested collaborative skills, the area on how they communicated and interacted in order to motivate other members to share their thoughts and ideas was a skill needing enhancement. This failure to be open is due to the fear of offending others which is a factor that hinders the group to collaborate effectively.

It is recommended that further study on collaborative skills should be made and more parameters should be added in the questionnaire.

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