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Research Article Title:

**Exploring the effectiveness of using cooperative teaching strategies towards
advancing teamwork skills**

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Exploring the effectiveness of using cooperative teaching strategies towards advancing teamwork skills.

Abstract

Sources such as Rossouw (2001); Rhodes University (2010) as well as Fallows and Steven (2000) indicate that students are ill equipped for the working environment as they lack core competencies such as teamwork, problem-solving and communication skills. Therefore, this research focuses on the effectiveness of cooperative teaching strategies to advance teamwork skills in higher education and explore how students may be assisted to increase their core competencies and teamwork skills, to present themselves as employable. This article reflects on the research results produced using a survey questionnaire on a sample group of higher education first-year students enrolled for an Introduction to Project Management module. The findings discussed herein, provide interesting and valuable insight for educators as to which cooperative teaching and learning strategies inspires significant learning experiences. The final recommendation is to seek support to extensively increase the use of these specific cooperative teaching and learning strategies in the classroom.

1 Introduction and Purpose

The purpose of the research is to explore the effectiveness of using cooperative teaching and learning strategies in higher education towards advancing teamwork skills required in the workplace. The objective was to explore factors that impact the successful use of cooperative teaching and learning strategies that advance teamwork skills, by understanding and interpreting students' perspectives from their answers provided in the research questionnaire. Teamwork skills are defined by Business Directory (2015) as communication, negotiation, problem solving, and conflict management skills, to mention the vital few. Teamwork is a crucial part of a successful business, with a prerequisite of working effectively together to successfully achieve company goals (University of Colorado, 2015). Cooperative learning may be described as teams which function together, supporting creative environments resulting in generation of new ideas through social interaction; both within education and workplace to achieve maximum potential (Johnson, Johnson & Holubec 1994).

Considering the above, the intention of this research is to establish which cooperative teaching and learning strategies *inter alia*; teamwork activities, Jigsaw and learning pairs; may be implemented in higher education to promote development of essential teamwork skills.

2 Background and Objectives to Research.

Through research, the University of Toronto (2011), established that employers rated the top two work skills competencies as; communication and teamwork skills. Working in teams promotes deeper learning which develops through interaction, problem-solving, group-discussion, as well as negotiation; all through the process of cooperation.

Per the South African Qualifications Authority (1998), higher education strives to build opportunities to develop critical cross-field outcomes, such as knowledge acquisition, communication efficacy, solving problems, as well as working in teams. Hence the primary goal of higher education is to prepare individuals for functioning in any workplace, which is achieved through equipping students with valuable competences relevant for their field of work (Louis, 2011). It is not strange that these required skills that higher education strives to build are also twenty-first century skills, *inter alia*; effective communication, problem solving and cooperation through teamwork. Fallows et al; (2000), support this statement and add that the ability to keep up with current economic changes requires team-interaction and problem-solving; as merely having academic knowledge is insufficient.

Empirical research of the problem is explored through asking questions relating to 'what' is being researched, more specifically, the questions applied to this research included:

- What types of cooperative teaching strategies and activities, implemented with first-year students, support the development of teamwork competency skills?
- What cooperative activities did the students find helpful to acquire teamwork skills and the ability to work with diverse people?
- What teamwork skills were developed by students through cooperative activities?

3 Literature Review and Conceptualisation

3.1. Teamwork Explained

In teamwork members are focused toward a common goal with a clear purpose, which is an essential element of success (Johnson & Johnson, 1999; Parker, 1990; Harris & Harris, 1996). The ability to interact as part of a team is an integral part of any organisation and should be incorporated in the delivery of higher educational modules (Skills Development Act, 1998). Team members must be willing to adapt and fully participant to create cooperative working environments where goals are achieved through cooperation and social interdependence (Luca & Tarricone, 2001).

Teamwork activities relies upon individuals working together in a cooperative environment through sharing knowledge and skills to achieve common goals (Harris & Harris, 1996). The University of Minnesota (2013), explains that during teamwork activities, skills are developed which include improved critical thinking, increased retention and transfer of new information, increased motivation as well as improved interpersonal skills. Whereas cooperative teaching is described by Readers Digest Universal Dictionary (1987) as the cooperative effort by several individuals working as members of a group to achieve a mutual objective therefore cooperative teaching strategies makes use of techniques such as teamwork activities which allows students to work together in teams to enhance sharing, shaping and amplifying intellectual skills.

3.2. Teamwork Teaching Strategies

The ability to interact as part of a team is an integral part of many organisations and should be incorporated in the delivery of higher educational modules (Skills Development Act, 1998). Cooperative teaching strategies; such as group work, jigsaw and teamwork activities, creates an environment where cooperative interaction is less threatening or stressful as per Killen (2015), this encourages students to learn more effectively by allowing exploratory talk, opportunities for students to test their understanding, and share new ideas. Millis & Cottel (1998), concur with Killen (2015), that these cooperative learning and teaching techniques; aid students to comprehend beneficial results required for developing teamwork skills.

Killen (2015) states cooperative teaching strategies creates a teamwork environment, where information is broken into sections and each member of a team is given information to learn. Those with the same information then get into expert groups to discuss their section of information; now members return to original team to teach their teammates which ensures each member listens carefully to learn all sections by showing interest in others.

3.3. Definitions

Some key definitions used in this research include, teamwork activities, cooperative learning and teaching as well as the Jigsaw method.

3.3.1. Teamwork Activities

Teamwork activities relies upon individuals working together in a cooperative environment through sharing knowledge and skills to achieve common goals (Harris & Harris, 1996). The University of Minnesota (2013), explains that during teamwork activities, skills are developed which include improved critical thinking, increased retention and transfer of new information, increased motivation as well as improved interpersonal skills.

3.3.2. Cooperative Teaching Strategies

Cooperative teaching is described by Oxford Dictionary (2016) as the cooperative effort by several individuals working as members of a group to achieve a mutual objective therefore cooperative teaching strategies makes use of techniques such as teamwork activities which allows students to work together to enhance sharing, shaping and amplifying intellectual skills.

3.3.3.Jigsaw Method

The Jigsaw method is a cooperative teaching strategy which creates a teamwork environment, where information is broken into sections and each member of a team is given information to learn. Those with the same information then form expert groups to fully explore the information; now members return to original teams to teach their teammates. This technique is advocated by Killen (2015) as it ensures each member listens carefully to learn all sections by showing interest in others.

4 Research Methodology

4.1 Design

A quantitative data collection approach is applied as a random sample is chosen, due to the whole population not being possible to study (Du Plooy-Cilliers et al, 2014:148). This approach is harnessed to investigate the thoughts, feelings and actions of respondents to the various questions, hence a generalised result is concluded (Mouton, 1996).

A cross-sectional survey design in the form of a questionnaire to capture data from the sample population is utilised as data is collected once, from the sample population and is not repeated. Primary data is collected through making use of a self-administered questionnaire which is handed

to the respondent, who completes it on his/her own, then the data is gathered, collated and recorded as the research (De Vos et al, 2005).

The questionnaire includes general, specific and closed-ended questions that are applicable to the learning methods respondents were exposed to during their Introduction to Project Management module (Du Plooy-Cilliers et al, 2014:153). Questions variations include scaled, Likert and ranking questions (Babbie, 2001).

4.2 Research Process

Manual data analysis is possible due to the reasonably small number of participants however some computer analysis using frequencies and cross-tabulations is required. Raw data is examined to detect if there are any errors or omissions before the analysis commences (Du Plooy-Cilliers et al, 2014).

A Microsoft Excel program is the main tool employed to arrange information in tabulation format which allows summarisation of raw-data; facilitates comparison and classification which conserves space as well as reduce explanations and descriptive statements (Dawson, 2002). Furthermore, the Microsoft Excel program, allows easy collation, descriptive statistics that include; frequencies, summaries and counts with minimal effort allowing a variety of graphical display of findings through tables, bar graphs and pie charts (Hohmann, 2005).

4.3 Sample and Population

In this research the target population is all students studying towards the National Qualifications Framework - NQF level 5 Higher Certificate in Business Practice and Principles (HCBPP) in South Africa. A population consists of the total group, all entities, people or individuals which possess properties of the characteristics in which the researcher is interested to study and from whom information is required (Keyton, 2011:121 and Wiid & Diggines, 2013:186). The population is extensive and consists mainly of young adults between the ages of eighteen to twenty-three which makes them millennium students who seek social interaction and recognition, which has a focus on interpersonal communication (Gravett et al, 2004).

As the full population is not possible to research, because the researcher is unable to define and has limited access to the entire population; therefore, a convenient sample, of around ten percent of the total number of students studying this module at one higher educational facility, is chosen as the researcher already knows and has access to these respondents.

Non-probability convenient sample is used as the sample is not random and the research being applied is social research where circumstances are not feasible or practical therefore non-probability convenient sample is chosen and respondents are volunteers; thus, the sample is heterogeneity as the researcher wants to include all opinions and views (Dissertation Laerd, 2015). The participants were informed of what was required of them and voluntary consent of being part of the research gained, including permission to use the respondent's answers to compile the research. Respondents could withdraw from the research study at any time without discrimination or being penalised in any way. All personal information of the participants is kept confidential by allowing anonymity, so personal information cannot be linked to participant's answers (William, 2006).

4.4 Feasibility

The findings of this research are feasibility as the outcome strives to positively affect other educators by identifying relationships, developing theories and supporting future planning or the generation of further research (Du Plooy-Cilliers et al, 2014). Since respondents are volunteers there would be little to no expenditure required as all respondents are known and the researcher has access to these respondents.

4.5 Limitations

Once possible shortcoming of the study is possible misinterpretation as respondents are of different ages ranging from eighteen to twenty-three who have a lack of English language proficiency hence the level of understanding and interpretation of questions may be erroneous (Du Plooy-Cilliers et al, 2014). The potential impact of these limitations is that the quality of the findings may be inaccurate and the ability of the respondent to effectively answer the research questions may be constrained (Lund Research Ltd., 2012).

4.6 Outcomes

Research outcomes and results may affect other people hence the researcher is aware and practiced honesty and integrity, hereby taking full responsibility to serve the larger community with confidence that the process is completed per the general Ethical Code of the South African Council for Social Service Professionals (1986).

The researcher did not falsify information, distort results or allow bias to influence the interpretation of results to ensure integrity, hence the interpretation of results is reliable (Du Plooy-Cilliers et al,

2014). The validity and reliability is ensured by posing alternative wording in different questions to draw the same conclusion, thus respondents answers should have the same result in these two or three different questions to ensure answers given are reliable and not randomly selected. In the scaling questions, no middle ground is provided to ensure respondents answer honestly and answers provided are compared for validity (Mouton, 1996).

5 Results and Findings of Research

Research results and findings shall be presented question by questions as there is insufficient questions which allow for categorisation. A total of 14 questions were presented in the questionnaire and all the respondents answered each of the 14 questions, therefore results and findings of all 14 questions shall be presented.

5.1 Question 1 Learning and Teaching Methods

The objective of question 1 was to identify which learning methods respondents were exposed to during Introduction to Project Management module.

The chart in figure 5.1. below list the kinds of learning methods respondents were exposed to during the presentation of the module. Respondents could choose as many of the learning methods they felt relevant and could select from learning methods such as teamwork, group work, learning pairs, cooperative learning, role play, Jigsaw and group discussions. The vertical axis in the chart indicates the number of respondents, whilst on the horizontal axis the vertical bars indicate how many respondents chose each of the learning methods.

Findings on which methods respondents identified as part of the Introduction to Project Management module is presented in the bar chart below:

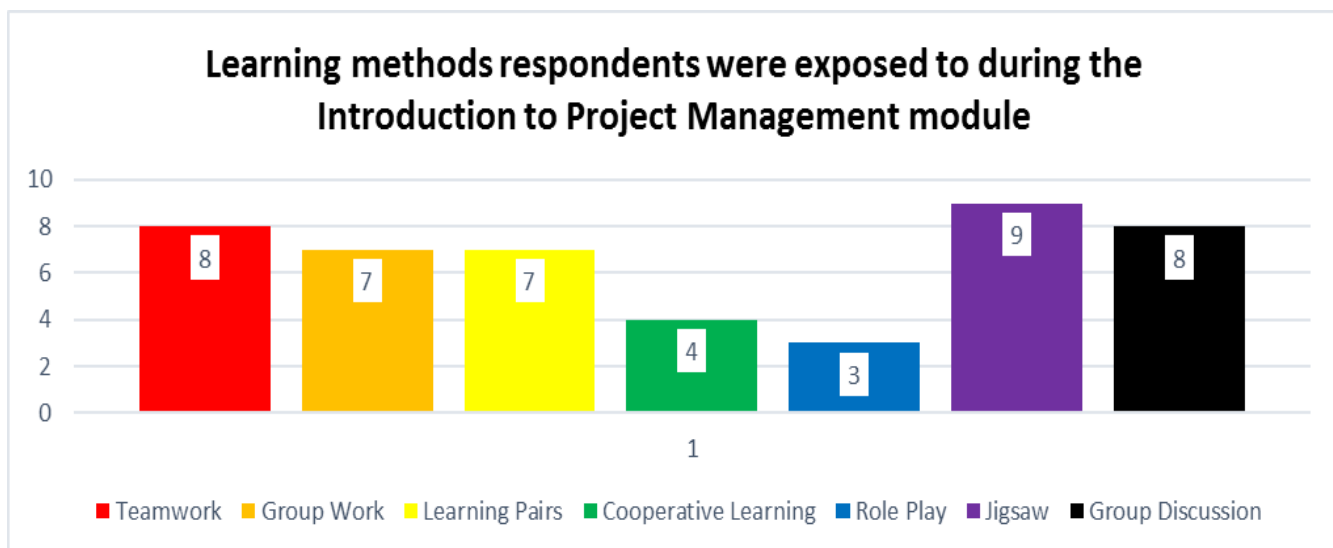


Figure 5.1 Learning Methods used during the Introduction to Project Management Module

Respondents confirmed exposure to all seven learning methods during the Introduction to Project Management module however to different degrees as not all respondents chose all learning methods but the findings elude to the fact that students are aware that cooperative teaching strategies aid the learning experience in developing teamwork skills.

5.2 Question 2 Teaching Methods Encouraging Learning

Through question 2 the researcher intends to establish how well or to what degree the use of various teaching methods encouraged learning to take place in the higher education classroom during the Introduction to Project Management module?

Table 5.1 below provide a summary of the findings:

Table 5.1 The degree to which various teaching methods encouraged learning in the classroom.

<u>The degree to which various teaching methods encouraged learning in the classroom</u>				
	1. Not at All	2. Somewhat	3. Sufficient	4. Considerable
Teamwork	10%	20%	40%	30%
Group Work	0%	30%	40%	30%
Learning Pairs	0%	0%	80%	20%
Cooperative Learning	0%	10%	60%	30%
Role Play	0%	40%	40%	20%
Jigsaw	0%	30%	20%	50%
Group Discussion	10%	0%	40%	50%

Conclusion: Respondents were asked to rate how well they believed the use of various teaching methods encouraged learning in the classroom, as indicate in table 5.1, above.

Respondents indicated that both the Jigsaw method and group discussion weighted 50% as considerably encouraging learning in the classroom; studies done by Johnson & Johnson (1989), and Hsiung (2013), indicate that their research draws the same conclusion: that more learning takes place when students work together using cooperative teaching methods. 80% of respondents agreed that learning pairs sufficiently encouraged learning whilst participating in cooperative learning activities. As per the findings very few respondents, 10 % (1 respondent out of 10) indicated that teamwork and group discussion did not encourage learning during engagement with these activities.

The meaning of this finding indicates that when students are engaged in learning with each other, through the Jigsaw method and group discussion, this significantly aided and encouraged the greater learning as students were actual participants of the learning process making use of teamwork skills.

5.3 Question 3 Learning And Teaching Methods Aiding Teamwork Skills

In question 3 the respondents were asked to indicate which educational strategy assisted most in building problem solving, discussion, negotiation and communication skills. Effective teamwork involves obvious skills such as problem-solving, discussion, negotiation and communication. The main intent of this question is to identify which learning methods, such as problem-solving,

discussion, negotiation & communication skills were seen by respondents to be most effective in building teamwork skills.

The findings are reflected in the bar graph, figure 5.2, below:

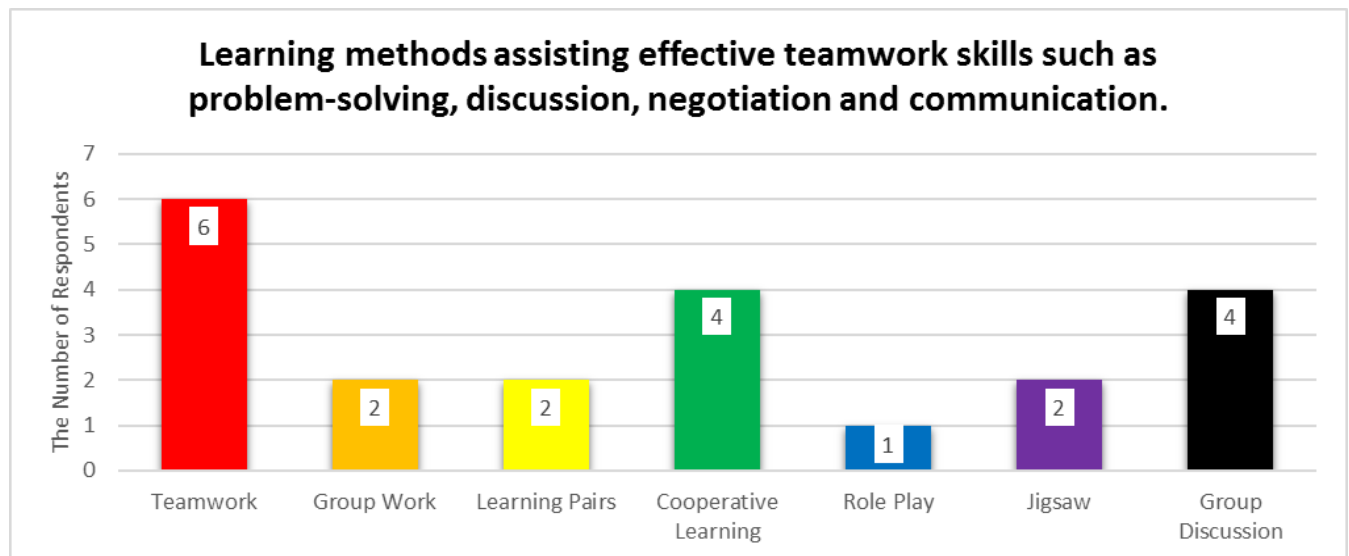


Figure 5.2 Learning methods assisting effective teamwork skills.

The results above, clearly indicates that teamwork activities assisted the most to develop effective teamwork skills, supported by 60% (6 out of 10) of respondents, whilst role play least assisted, and is indicated by only 10% (1 out of 10) respondents selecting role play. However both cooperative learning and group discussion was ranked 2nd to teamwork activities and was supported by 40% (4 out of 10) of respondents choosing these 2 methods. The remaining 3 of group work, learning pairs and Jigsaw were all supported equally with 20% (2 out of the 10) respondents.

Griffith University (2011), states that problem-solving skills focuses on how students can develop approaches that will enable them to frame, set and solve problems, and confirms the effectiveness of a variety of learning contexts, such as teamwork and cooperative learning activities.

These findings help to answer the main research questions of:

- What cooperative activities help students acquire teamwork skills?

5.4 Question 4 Learning Methods Aiding Communication Skills

In questions 4 respondents were allowed to select as many learning methods as they felt necessary to indicate which aided them most in developing communication skills. To be an effective team player would require invaluable communication skills. On the vertical axis, the number of respondents out of 10 that chose the learning methods were indicated whilst on the horizontal axis shows the various learning methods that respondents could choose from to indicate which they felt built most effective team communication skills. A variety of learning methods were explored and

respondents indicates that group discussion best assist building effective communication skills and ranked 2nd is teamwork followed by group work. Both learning pairs and Jigsaw came in 4th place whilst both cooperative learning and role play were placed last. These results are confirmed in the chart, figure 5.3, below:

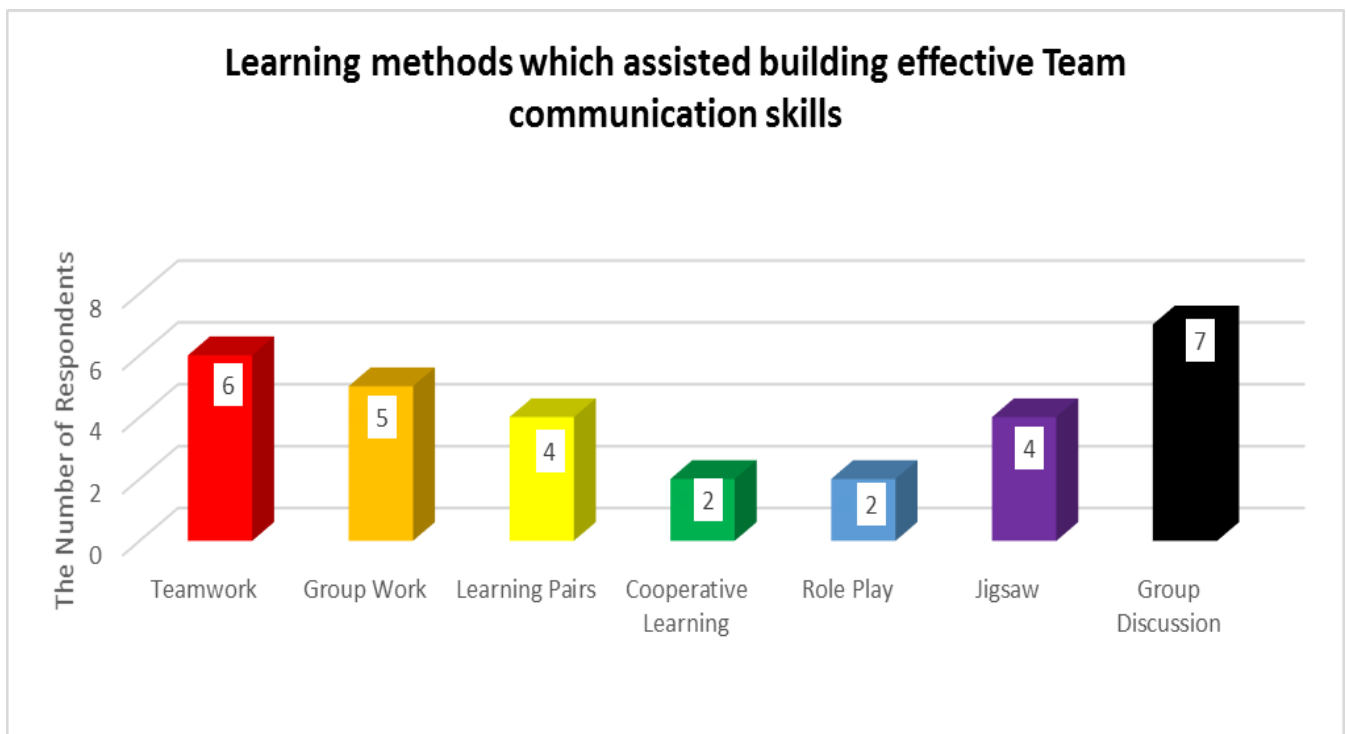


Figure 5.3. Learning methods to build effective team communication skills

The above findings are confirmed by Killen (2015), that team players need to be effective communicators in order to work as a team. However some of these findings are in contradiction with known literature, as Figure 5.3, above indicates that both cooperative learning and role play least assisted, whereas Dillon (2015), indicated that role play and cooperative learning games may successfully be used to develop effective team communication skills.

5.5 Question 5 Most Useful Learning Activities Developing Teamwork Skills

In order to establish which learning activities most developed teamwork skills, question 5, required respondents to rate the various learning activities, by rating each by selecting between: 1 not at all useful, 2 slightly useful, 3 adequately useful and 4 substantially useful, in order to establish which methods are most likely to develop teamwork skills. The findings are indicated in Table 5.2. below:

Table 5.2 Learning activities most useful to develop teamwork skills

<u>Learning activities most useful to develop teamwork skills</u>				
	1. Not at All	2. Slightly	3. Adequate	4. Substantial
Teamwork	0	2	2	6
Group Work	1	1	3	5
Group Discussion	0	4	1	5
Cooperative Learning	1	2	4	3
Learning Pairs	1	0	7	2
Role Play	1	3	5	1
Jigsaw	1	2	6	1

Conclusion from the findings is that teamwork activities were ranked highest with 60% (6 out of 10) respondents selecting teamwork activities was substantially aiding the development of teamwork skills, whilst both group work and group discussion ranked 2nd highest 50% (5 out of 10 respondents) to substantially built teamwork skills. Learning pairs, jigsaw and role play were all rated in the top 3 positions of being only adequately useful.

The findings in Table 5.2 is up-held by the Carlton College (2012), who suggested that students who engage in cooperative learning, such as teamwork activities, learn significantly more, remember it longer, and develop better critical-thinking skills than their counterparts in traditional lecture classes.

These findings abetted in answering the main research question being;

- What types of cooperative teaching strategies and activities, implemented with first-year students, support the development of teamwork competency skills?

5.6 Question 6 Skills Developed Through Group Activities

In order to clarify the kind of teamwork skills that may be developed through collaborative group activities, question 6 required respondents to identify from a list of skills, which skills they felt were most beneficial and were acquired through group activities. The results are indicated in table 5.3 below:

Table 5.3 Various skills developed through group activities

<u>Skills developed through Group Activities.</u>	
Type of Skills Acquired.	Respondent Ratings
Communication Skill	10 / 100%
Problem Solving Skills	7 / 70%
Discussion Skills	6 / 60%
Negotiation Skills	6 / 60%
Conflict Management Skills	6 / 60%
Interpersonal Skills	5 / 50%

and problem solving skills were selected by 70% (7 out of 10) respondents. All 3; discussion, negotiation and conflict management skills were equally ranked at 60% (6 out of 10) respondents choosing these three equally. Interpersonal skills is rated as being the least acquired through cooperative activities at only 50%.

Fallows et al; (2000) agree with these findings and state that if students are to keep up with current economic changes, it would require of students to have teamwork, problem-solving and effective communication skills, as merely having academic knowledge is insufficient.

The reason for this research and the findings herein successfully answers one of the main research questions to establish:

- What teamwork skills were developed by students through cooperative activities?

5.7 Question 7 Teamwork Improves Communication Between Students And Educators

This questions tries to establish if through the use of teamwork activities, communication may be improve between student and educator, educator and student as well as between students and student. Figure 5.4, below indicates that findings:

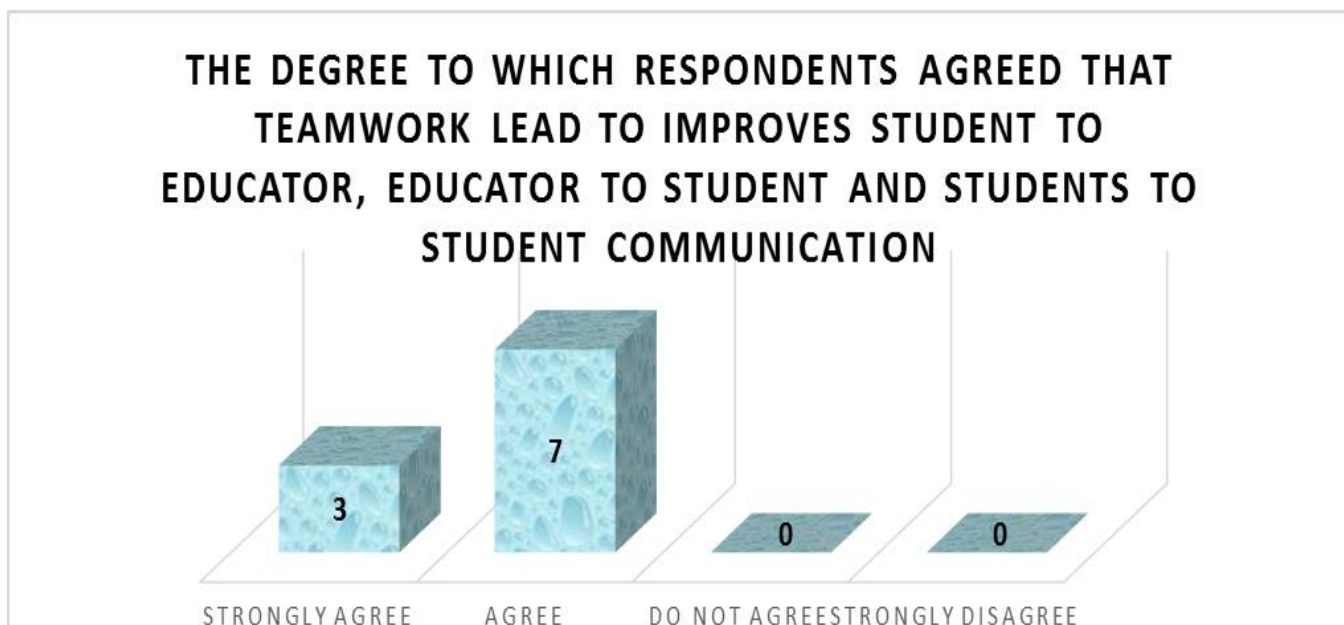


Figure 5.4. Teamwork contribution to Interactive Communication.

The findings as stated above in Figure 5.4 indicate that 70% (7 out of 10) respondents agree, and 30% (3 out of 10) respondents strongly agree that teamwork leads to improved interactive communication. It may therefore be concluded; that none of respondents disagreed that teamwork leads to effective interactive communication between students and educators.

Igel (2010) confirms that collaborative teaching methods, such as teamwork activities supports students learn more effectively by allowing exploratory talk, opportunities for students to test their understanding, and share new ideas. The environment created through teamwork activities is less threatening and less stressful as mistakes in smaller groups help shy students interact without feeling overwhelmed as if talking in front of the whole class (Igel, 2010; Killen, 2015).

The findings in both this question and question 4 conclude that communication skills are developed whilst engaging in teamwork activities.

5.8 Question 8 Which 2 Learning Methods Assist Learning In Groups

Teamwork requires people to work together in groups, hence the aim of this questions tries to identify which learning methods should be utilised most in ensuring that students develop the skills required for teamwork. In question 8, respondents were requested to only choose two (2) of the available seven (7) learning methods which they felt assisted them most in their overall process of learning to work together in a group.

THE 2 LEARNING METHODS RESPONDENTS FELT ASSISTED MOST IN OVERALL PROCESS OF LEARNING TO WORK TOGETHER IN A GROUPS

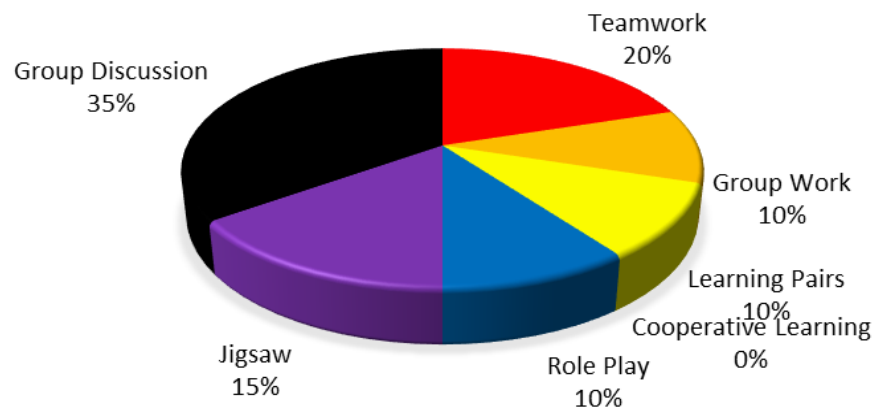


Figure 5.5. Educational Strategies that Improve collaboration.

The research findings as displayed in the pie chart, Figure 5.5 above, indicates that the 2 learning methods respondents felt most assist the learning process is group discussion 35% and teamwork activities 20% which is confirmed by Barkley, Cross and Major (2005) who state that cooperative learning techniques may be loosely categorized by the skill that each enhances through cooperative learning exercises such as teamwork activities and group discussions. Jigsaw was ranked 3rd with 15% where group work, learning pairs and role play were equally selected at 10%. Interesting cooperative learning seemed to have no support from these respondents.

Further support and validity may be seen in this research as the same two (2) cooperative learning strategies recorded in the findings of question 4, as assisting the most, were that of group discussion and teamwork activities.

These findings again promote answering the main research question as:

- What types of cooperative teaching strategies and activities, implemented with first-year students, support the development of teamwork competency skills?

5.9 Question 9 Learning Activities Ensured Sharing Of Knowledge And Skills

In an effort to understand if students felt that they shared knowledge and skill if engaged in various learning activities; question 9 required respondents to indicate they either agreed or disagreed, that during the exposure to various learning activities, individual students would have worked together through the sharing of knowledge and skills in order to achieve common goals?

**DEGREE TO WHICH RESPONDENTS AGREED THAT DURING
EXPOSURE TO VARIOUS LEARNING ACTIVITIES, INDIVIDUAL
STUDENTS WORKED TOGETHER THROUGH SHARING KNOWLEDGE
AND SKILLS TO ACHIEVE COMMON GOALS?**

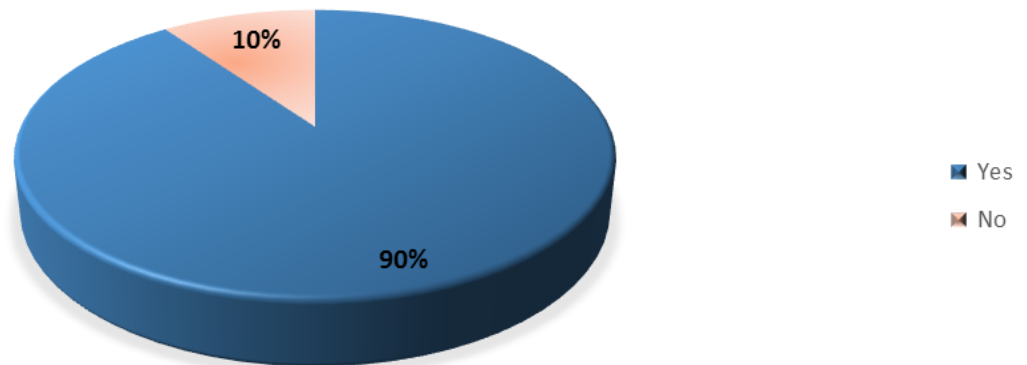


Figure 5.6 Degree to which Respondents agreed that during exposure to various learning activities, individual students worked together through sharing knowledge and skills to achieve common goals

As per the findings displayed above in figure 5.6, it may be concluded that 90% (9 out of 10) respondents agreed with the statement in question 9, that during the exposure to various learning activities, individual students would have worked together through the sharing of knowledge and skills in order to achieve the common goals. The remaining 10% (1 out of 10) respondents disagrees with the statement. These findings are line with Oxford Dictionary (2016) which states, collaborative teaching methods make use of techniques that allows students to work together in teams to ensure intellectual skills are shared, shaped and amplified during teamwork and other learning activities.

5.10 Question 10 Skills Development During Collaborative Learning Activities

In order to answer one (1) of the main research questions of this study:

- What teamwork skills were developed by students through cooperative activities?

Respondents were asked to select all of the skills they felt in their opinion where built and developed when exposed to the various cooperative learning methods and cooperative activities. Table 5.4 below reflects the respondent answers:

Table 5.4 Cooperative learning methods / activities developed teamwork skills

To what degree did the learning methods / activities develop teamwork skills						
	Communi- cation Skill	Discussion Skills	Negotiation Skills	Problem Solving Skills	Interpersonal Skills	Conflict Management Skills
Teamwork	5	0	2	3	2	2
Group Work	1	2	0	4	1	1
Learning Pairs	0	0	1	0	1	2
Cooperative Learning	0	0	4	3	4	2
Role Play	5	0	3	0	1	1
Jigsaw	1	0	0	0	0	2
Group Discussion	3	7	0	0	0	0

The findings indicate above in table 5.4; communication skills were mostly refined when completing teamwork activities and role play whilst group discussion developed discussion skills. Problem solving skills were expanded when performing group work whilst cooperative learning developed negotiation and interpersonal skills. Conflict management skills seemed to be build in all learning methods besides group discussion. It is interesting to note that respondents felt neither discussion nor problem solving skills were being developed through role play and Jigsaw. Respondent results further indicate that neither communication nor discussion skills were nurtured during learning pairs or cooperative learning. However Bowden *et al*, (1998) indicates teamwork skills such as communication, negotiation and problem-solving skills are usually fostered when opportunities are created through cooperative teaching strategies such as teamwork, role play and Jigsaw.

5.11 Question 11 Cooperative Learning Methods And Activities Building Skills

Respondents were required to only choose the top two (2) skills, that they felt in their opinion, were supported and built whilst being exposed to and completing cooperative learning methods / activities during the Introduction to Project Management module. The purpose of question 11, is to answer one (1) of the research questions of this study;

- What teamwork skills were developed by students through cooperative activities?

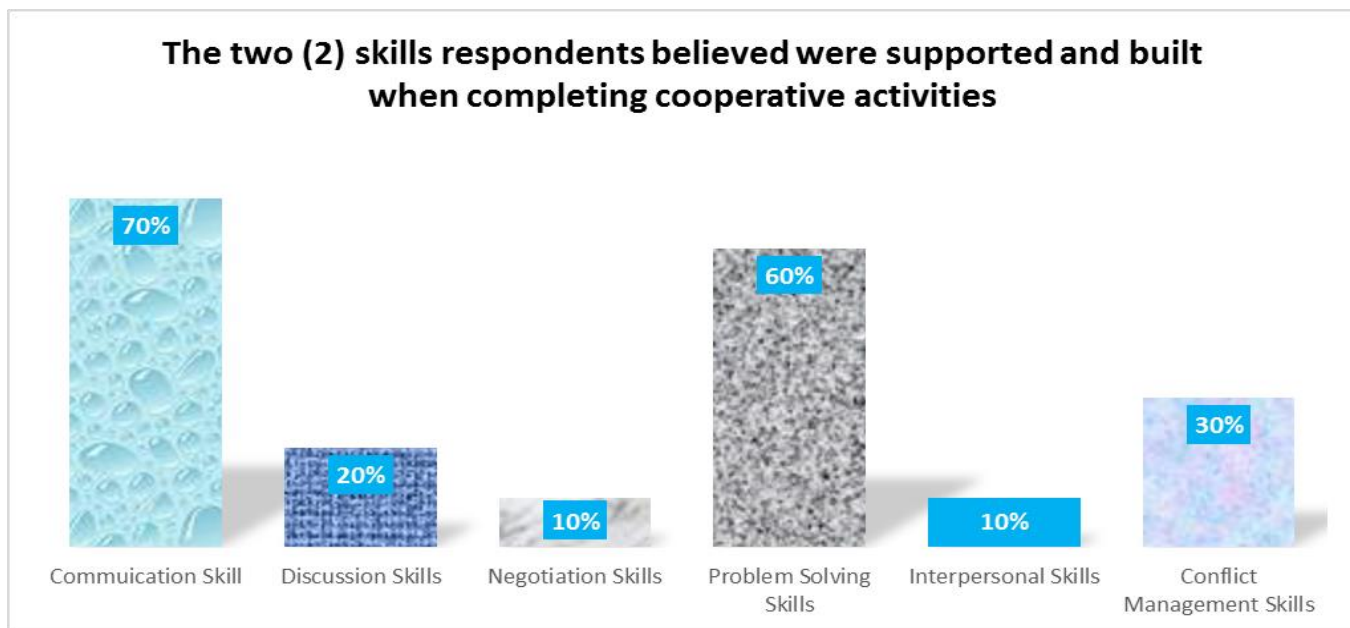


Figure 5.7 The two (2) skills respondents believed were supported and built when completing cooperative activities

Figure 5.7 indicates that the two (2) highest skills being supported when completing cooperative activities is communication and problem solving skills. This is corroborated by the research done by University of Toronto (2011) and is established that employers' rated communication skills the highest competency required by students seeking employment. Alternatively, the two (2) lowest skills chosen were negotiation and interpersonal skills.

Through the findings of this research it is established that communication skills are most developed when implementing cooperative teaching strategies and activities such as teamwork activities and role play, which corresponds with the research findings of University of Toronto (2011).

These same results are seen in the findings of this research in question 6 where both communication and problem solving skills were seen to be built most when completing group activities hereby further indicating validity of findings of these two (2) questions.

5.12 Question 12 Most Valuable Cooperative Learning Methods

The intention of question 12 was to establish which cooperative learning methods / activities respondents felt, in their opinion, were most valuable in advancing the development of teamwork skills. Respondents were requested to rank the various cooperative activities, on a scale of one (1) to five (5), where one (1) is not valuable and five (5) most valuable.

Table 5.5 learning activities respondents found most valuable to develop teamwork skills

<u>Learning activities respondents found most valuable to develop teamwork skills</u>					
	1. Not Valuable	2. Slightly Valuable	3. Neutral	4. Reasonably Valuable	5. Mostly Valuable
Cooperative Learning	1	0	2	3	4
Jigsaw	2	2	0	2	4
Group Discussion	1	0	2	3	4
Teamwork	0	1	3	3	3
Learning Pairs	1	0	3	3	3
Group Work	1	0	1	6	2
Role Play	2	3	3	2	0

The findings in Table 5.5 above indicate the most valuable learning activities to develop teamwork skills are; cooperative learning (40% most valuable & 30 % reasonably valuable), Jigsaw (40% most valuable & 20 % reasonably valuable), with group discussion (40% most valuable & 30 % reasonably valuable), which is validated by Du Plooy-Cilliers et al (2014) who suggestions that teamwork and collaborative activities may be used in the classroom to more effectively ensure work place and teamwork skills are developed. In contrast, role play seemed to be ranked lowest with both 30% being allocated to slightly valuable and neutral as well as 20% allocation of not valuable.

The conclusion from the findings well answers the main research questions of;

- What types of cooperative teaching strategies and activities, implemented with first-year students, support the development of teamwork competency skills?

5.13 Question 13 Learning Methods Encouraging Teamwork Skills

The basis of question 13 is to establish which learning methods most encouraged teamwork skills. Respondents were requested to rate the seven (7) learning methods by ranking them from 1 to 7 with 1 being best & 7 being worst. Table 5.6 below indicated a summary of the respondent answers:

Table 5.6 Learning methods which most encouraged teamwork skills

<u>Learning methods which most encouraged teamwork skills</u>		
<u>Learning Methods</u>	<u>Ranking</u>	<u>Result</u>
Teamwork	27	Best
Group Work	36	
Learning Pairs	43	
Cooperative Learning	46	
Role Play	44	
Jigsaw	34	
Group Discussion	50	Worst

Conclusion: Teamwork activities ranked highest (lowest score) as the learning method which most encouraged teamwork skills whilst group discussion was ranked least (highest score). These findings are supported by Open Colleges (2016) that states learning methods encourages teamwork skills through team and group work.

5.14 Question 14 Best Learning Methods To Build Teamwork Skills

The focus of question 14 is to establish which two (2) learning methods did respondents feel in their opinion build teamwork skills most effectively, by only be able to select the top two (2). Figure 5.8 below provides an overview:

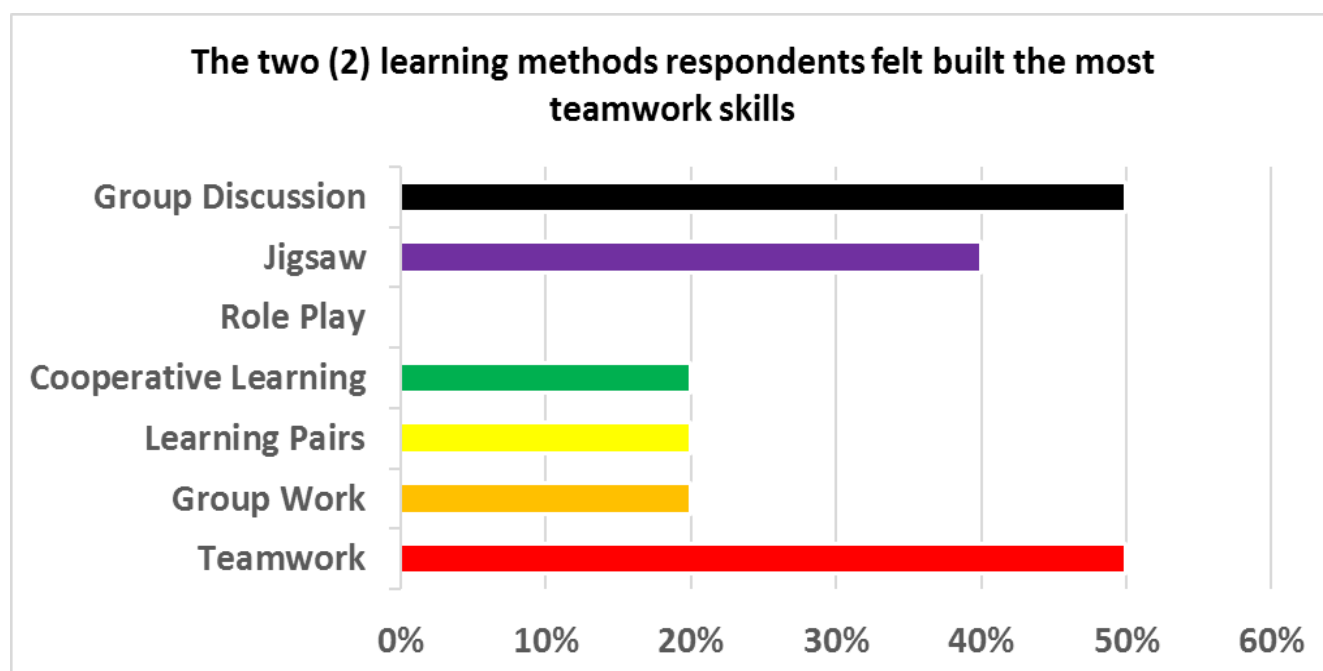


Figure 5.8 The two (2) learning methods respondents felt build the most teamwork skills

The findings above, indicate that both teamwork activities and group discussion ranked highest to build teamwork skills with 50% of the respondents choosing these two (2) as the highest, whilst cooperative learning, learning pairs as well as group work all three ranked the lowest which is substantiated by, van der Bilt University (2016), which indicated that cooperative learning techniques is the idea that groups of people work together to learn or solve problems which is achieved through activities such as group discussion, teamwork activities or even the Jigsaw method. Further validation may be found in the findings of question 8 of this research which also resulted in the same two (2) methods, teamwork activities and group discussion being selected as aided the most to develop teamwork skills.

6 Recommendations and contribution of the research

Based on the findings above it is evident that cooperative teaching strategies such as; teamwork, group discussion and Jigsaw unconditionally assists building teamwork skills, therefore these strategies should earnestly be incorporated as part of regular integration of module time to support first year students to develop the needed teamwork competency skills required by the work place. The cooperative teaching strategies identified in this research, allow students to voice opinions, allowing for critically thinking and analysis of content being explored.

The findings are supported by numerous academic sources that cooperative teaching strategies and it is recommended that team activities should be extensively implemented in all higher educational classes to provide shy students opportunities to participate without feeling exposed or the centre of attention; this allows full participation whilst cultivating the necessary teamwork and interpersonal skills required in the world of work.

It is further recommended that broader research be undertaken to clarify how these methods may be utilised to improve specific one-on-one presentations, group-presentations, group briefing and feedback, cultivating effective communication skills.

Additionally, it is evident that further research is required due to some anomalies being experienced in certain questions as some respondents either did not understand, or possibly misunderstood the questions, resulting in asymmetrical responses. It is therefore suggested that greater care be taken when compiling research questions, to clarify respondents understanding of the research questions to improve results as well as research questions should focus on more specific experiences to achieve more accurate outcomes.

The final recommendation is to strive for more support from educators to implement in the classroom, strategies which significantly increase the use of cooperative teaching and learning methods such as teamwork, group discussion and Jigsaw to develop much essential core competencies.

7 Conclusion

Through the exploration of the effectiveness of using a variety of cooperative teaching strategies towards advancing teamwork skills, the objective was to attain results that would validate or disprove the successful application of a variety of cooperative teaching and learning methods that would support development of teamwork skills.

This research concludes that through the use of cooperative teaching and learning methods, the development of problem-solving, discussion, negotiation and communication skills are advanced, which is well advocated by a number of authoritative sources; hence the researcher is of the opinion, even though a few results were not in line with the majority of responses, this exploratory research successfully answered the original research questions as to which types of cooperative teaching strategies and activities, should be implemented with first-year students to support the development of teamwork competencies.

Value was created through this research as; teamwork, group discussion and Jigsaw were established to be the teaching and learning cooperative methods which aid students most effectively in developing teamwork skills, therefore the researcher urges other educators to explore these cooperative activities for themselves to provide their students with the best possible chance of securing much needed teamwork skills which ultimately better equips students for their futures in the world of work with mandatory core competencies.

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Annexure A: Questionnaire

Dear Respondent,

You are invited to participate in giving an opinion on the use of cooperative teaching strategies such as: Jigsaw, teamwork and group cooperation to improve your skills to work as part of a team. The research is part of a study conducted towards a post-degree qualification. Findings from the research will assist the educator in determining how teamwork skills can be taught.

Your personal identification information is not required as this research is only interested in your feedback to determine how teamwork skills can be taught. Your participation in this research is therefore voluntary and your privacy will be ensured.

You have a choice to either participate or decline participation. However, should you choose, you may withdraw from this study at any time without being penalised in any way.

It would be greatly appreciated if you complete all the questions honestly as the validity of the results depend on obtaining as many responses as possible. Therefore, if you wish to participate, please complete all fourteen (14) questions in the attached questionnaire.

Thanking you in advance for taking the time to complete this survey.

Kind Regards,

Trudi Schuin-Dorfling

Instructions:

- Complete all the questions in the questionnaire.
- Where boxes are available to provide your view, tick the box that expresses your view best
- Where you are asked to voice an opinion, use the space provided to write your views on how teamwork as a skill can be best taught.

1. Which of the following learning methods have you been exposed to during the Introduction to Project Management module?

You may select as many as you wish. Please tick those options that are relevant to you:

- | | |
|-------------------------|--------------------------|
| a) Teamwork | ☐ |
| b) Group Work | ☐ |
| c) Learning in Pairs | ☐ |
| d) Cooperative Learning | ☐ |
| e) Role Play | ☐ |
| f) Jigsaw | ☐ |
| g) Group Discussion | ☐ |

2. In your opinion, how well did the use of various teaching methods encouraged learning in the classroom?

On a scale of one (1) being none to four (4) being considerable, please tick the most relevant box related to each cooperative teaching method.

Method	1 Not at all	2 Somewhat	3 Sufficient	4 Considerable
a) Teamwork				
b) Group Work				
c) Learning in Pairs				
d) Cooperative Learning				
e) Role Play				
f) Jigsaw				
g) Group Discussion				

3. Effective teamwork involves obvious skills such as problem-solving, discussion, negotiation and communication.

Which of the following learning methods helped you build problem solving skills?

- | | |
|-------------------------|--------------------------|
| a) Teamwork | ☐ |
| b) Group Work | ☐ |
| c) Learning in Pairs | ☐ |
| d) Cooperative Learning | ☐ |
| e) Role Play | ☐ |
| f) Jigsaw | ☐ |

g) Group Discussion

4. To be an effective Team player, you would require skills such as communication skills.

Which of the following learning methods helped you build communication skills?

You may select as many as you wish – please tick which are applicable:

- | | |
|-------------------------|--------------------------|
| a) Teamwork | ☐ |
| b) Group Work | ☐ |
| c) Learning in Pairs | ☐ |
| d) Cooperative Learning | ☐ |
| e) Role Play | ☐ |
| f) Jigsaw | ☐ |
| g) Group Discussion | ☐ |

5. What activities did you found most useful to help learn teamwork skills and how to work with other people?

On a scale of one (1) being not at all to four (4) being substantial.

Please tick the most relevant box related to each cooperative teaching method.

Method	1 Not at all	2 Slightly	3 Adequate	4 Substantial
a) Teamwork				
b) Group work				
c) Learning in pairs				
d) Cooperative Learning				
e) Role Play				
f) Jigsaw				
g) Group Discussion				

6. In your opinion, what of the following skills were built when completing the above mentioned cooperative activities?

You may tick as many as you like.

- | | |
|-------------------------------|--------------------------|
| a) Communication skills | ☐ |
| b) Discussion skills | ☐ |
| c) Negotiation skills | ☐ |
| d) Problem solving skills | ☐ |
| e) Interpersonal skills | ☐ |
| f) Conflict Management skills | ☐ |

7. Please indicate to what extreme you either agree or disagree that teamwork lead to improves student to educator, educator to student and students to student communication?

Strongly Agree ☐ e ☐ Not agree ☐ Strongly Disagree ☐

8. Please choose only TWO (2) of the below learning methods which you felt assisted you most in your overall process of learning to work together in a group with others.

Only select two (2) from the list below:

- | | |
|-------------------------|--------------------------|
| a) Teamwork | ☐ |
| b) Group Work | ☐ |
| c) Learning in Pairs | ☐ |
| d) Cooperative Learning | ☐ |
| e) Role Play | ☐ |
| f) Jigsaw | ☐ |
| g) Group Discussion | ☐ |

9. Do you agree that during exposure to various learning activities, individual students worked together through sharing knowledge and skills to achieve common goals?

Select the option most relevant to your experience?

YES ☐
NO ☐

10. In your opinion, what of the following skills were built most when completing the various learning activities?

Please tick the most relevant box related to each skill. For example:

Skills	Team-work	Group work	Learning in pairs	Co-operative learning	Role Play	Jigsaw	Group Discussion
a) Communication Skills	☐	☐	☐	☐	☐	☐	☐
b) Discussion Skills	☐	☐	☐	☐	☐	☐	☐
c) Negotiation Skills	☐	☐	☐	☐	☐	☐	☐
d) Problem Solving Skills	☐	☐	☐	☐	☐	☐	☐
e) Inter-personal Skills	☐	☐	☐	☐	☐	☐	☐

f) Conflict Management Skills							
-------------------------------	--	--	--	--	--	--	--

11. Whilst being exposed to the cooperative activities, in your opinion which of the following skills were most supported and built when completing these cooperative activities.

Please only choose TWO (2) from the below:

- | | |
|-------------------------------|--------------------------|
| a) Communication skills | ☐ |
| b) Discussion skills | ☐ |
| c) Negotiation skills | ☐ |
| d) Problem solving skills | ☐ |
| e) Interpersonal skills | ☐ |
| f) Conflict Management skills | ☐ |

12. Whilst being exposed to various activities, in your opinion which did you found most valuable to help you learn teamwork skills? Please rank the following cooperative activities, on a scale of one (1) to four (4), where one (1) is not valuable and five (5) most valuable.

Method	1 Not valuable	2 Slightly valuable	3 Neutral	4 Reasonably valuable	5 Most valuable
a) Teamwork					
b) Group work					
c) Learning in pairs					
d) Cooperative learning					
e) Role Play					
f) Jigsaw					
g) Group Discussion					

13. In your opinion, which cooperative teaching methods encouraged the best development of teamwork skills?

Please rank the methods below from one (1) to seven (7), with one (1) being the best method to encourage team skills and seven (7) being the worst method to develop team skills.

- | | |
|-------------------------|--------------------------|
| a) Teamwork | ☐ |
| b) Group Work | ☐ |
| c) Learning in Pairs | ☐ |
| d) Cooperative Learning | ☐ |
| e) Role Play | ☐ |
| f) Jigsaw | ☐ |

g) Group Discussion

14. In your opinion, which of the following learning methods would build the most teamwork skills?

Please choose only TWO (2) of the below learning methods:

- | | |
|-------------------------|--------------------------|
| a) Teamwork | ☐ |
| b) Group Work | ☐ |
| c) Learning in Pairs | ☐ |
| d) Cooperative Learning | ☐ |
| e) Role Play | ☐ |
| f) Jigsaw | ☐ |
| g) Group Discussion | ☐ |

Thank you for completing this questionnaire.