

**Student's Perceptions of Generic Skills for Effective Collaborative Learning  
Relative to Student Achievement**

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## **ABSTRACT**

Collaborative and cooperative learning in small groups are generally considered effective learning approaches. Successful group activities, however, assume competence in a range of skills. This empirical paper seeks to identify whether undergraduate students with different levels of academic achievement have different perceptions of the relative importance of Ehrman and Dornyei's (1998) generic sub-skills, i.e. do high performing students emphasise different skills? Students in a first year management subject were surveyed. No differences were found between high achieving and low achieving students in terms of the importance that they place on the various generic sub-skills. Productivity focussed skills were considered most important followed by relationship and communication skills. The implications for preparing students for group work are considered.

**Keywords:** Skills Development – Business Education - Team Building – Interpersonal Communication

This study seeks to extend the literature by examining students' perceptions of what they consider to be the most important skills for collaborative learning. This study will facilitate the equipping of students for successful group work by identifying those skills that students consider to be important in their experience, and by identifying whether students with different levels of academic achievement, in exams and in a group investigation, have different perceptions with regard to which skills are valuable for successful group work. The following hypotheses will be addressed.

*Hypothesis 1 When ranked by their performance in a group investigation, high achieving students will emphasise different collaborative learning skills to those emphasised by low achieving students.*

*Hypothesis 2 When ranked by their performance in a group investigation, high achieving students will place different emphases on productivity, communication and relationship skills compared to low achieving students.*

*Hypothesis 3 When ranked by their performance in exams, high achieving students will emphasise different collaborative learning skills to those emphasised by low achieving students.*

*Hypothesis 4 When ranked by their performance in exams, high achieving students will place different emphases on productivity, communication and relationship skills compared to low achieving students.*

## **THEORETICAL BACKGROUND**

Groupwork-based assessments are becoming increasingly common in tertiary business-related subjects, engaging students in collaborative learning. Collaborative and cooperative learning have three key characteristics: learners work together to learn in small groups; group members are responsible for each other's learning and their own learning; the group's achievement is considered at least as important as the individual achievement (Erhman and Dornyei 1988).

An important point of difference between collaborative learning and co-operative learning, is that in the latter, teachers assume much responsibility, whereas in the collaborative approach the control and operation of the group remains in the hands of the students as much as possible (Strauss 2007: 148). White et. al. (2007: 71) note that 'three main reasons for adopting group work are commonly cited: (1) group or collaborative learning is an effective form of learning (Slavin 1996); (2) group work

promotes teamwork skills that employers require and value (Cooper and Lybrand 1998) and (3) efficiency in the use of staff time when student:staff ratios are falling (Sharp 2006).'

The value of collaborative learning has been widely reported with generally positive student perceptions of group work (e.g. Ellem 2007; White et. al. 2007; Campbell and Li 2006; Burdett 2003). However, some studies have reported students making negative comments about group work (e.g. Payne et. al. 2006; Burdett 2003). Individual issues include the issue of under-performing group members (Bourner et al. 2001; Boud 2001). Pauli and her colleagues have developed a scale for measuring student dissatisfaction with group work (Pauli et. al. 2008). Their Negative Group Work Experience instrument consists of 22 items across four factors: lack of group commitment; task disorganisation; storming group; fractionated group. Some issues appear to be related to specific groups of students, especially those not learning in their first language (e.g. Strauss 2001, 2007; Norton 2007; Campbell and Li 2006).

Remedies for some specific issues have been suggested. For example Nelson *et. al.* (1994) suggested group selection based on statistical analysis of values surveys. Gerstman and Rex's (2003) finding that shared group values with regard to work ethic and work outcomes were more important than ethnicity and or culture in determining positive group work outcomes would seem to encourage this approach.

There is also mounting evidence of the importance of group dynamics. Hendry (2002), considering collaboration in small groups engaged in problem-based learning, noted seven categories of individual and two categories of group dysfunctional behaviour. Norton (2007) emphasises the stages of group formation and successful progression through them (*c.f.* Pauli et. al. 2008). Fletcher & Stren (1989) suggest that students' familiarity with group dynamics, and confidence regarding their skills, play an important role in successful group interactions.

Burdett (2003) found that students' most reported recommendation for improving group work was to improve time management and communication. Additionally, Burdett (2003: 181) also found that the

majority of students reported increasing their competence in eight skills during the course of their group work including negotiation, rational argument and task management. Ellem (2007) reports on the teaching of social skills through group work in a tertiary science course, supporting the role of group work as a teaching tool for skills that require social interaction. While the gaining of skills is a valuable outcome of group work, the question must be asked, would students have better outcomes if their skill levels were higher at the beginning of their group work?

It is clear that the success of collaborative and cooperative learning groups can be impacted by a range of issues, however, the value of social skills or behaviours has been highlighted by Cohen (1994) and Johnson and Johnson (1995), reflecting the centrality of social interaction in cooperative and collaborative learning. Drawing on the work of these authors, Erhman and Dornyei (1998) have assembled a comprehensive set of skills for group work, asserting that proficiency in these skills (listed in Table 1) will benefit the interactions within the group. These skills can be characterised as representing one or more of three themes: communication, productivity and relationships. The communication theme embraces skills that are fundamentally about communication processes. The productivity theme embraces those skills that address achieving goals and making efficient use of resources. The relationships theme embraces the skills that address the development or maintenance of group relationships or the appropriate treatment of people. It should be noted that some skills have substantial aspects of two themes and are designated as both.

As it should not be assumed that each student will bring the same skills or skill levels to their groups, it would seem reasonable for academics to intervene to enhance students skill levels and hence their competence in working in groups. A first step would be to identify which skills are important, and this is the focus of this study. However, two related factors need to be considered. Firstly, students' academic achievement is a central interest for academics and students alike, and it would seem reasonable to consider whether high achieving students value different skills to low achieving students, i.e. are there skills that characterise high achieving students or groups?

Secondly, there is evidence that students' performance can vary with assessment type (*e.g.* Downs 2006; Bridges *et. al.* 2002), and so it would also seem reasonable to consider whether high achieving students in different assessment types value different skills to low achieving students.

## **METHODOLOGY**

### **Sample**

A self-report survey was distributed to a class of 427 first year undergraduate students providing 266 useable responses. The students were from a range of degree programs including Business, Marketing, Finance and Accounting. The sample included students from Australia, Canada, China, Germany, Hong Kong, Italy, Norway, Sweden, Taiwan, USA and small numbers from several other countries. The language of instruction was English. Data was collected in the last week of a semester during which students had completed two group investigations (Erhman and Dornyei 1998: 250), one resulting in an oral presentation and written report, the other resulting in a written report only and two exams.

### **Collaborative Learning Skills Preferences**

Students were asked to nominate the ten group skills, from those listed in Table 1, that they considered to be most important. The first 22 are behavioural skills commended by Erhman and Dornyei (1998) while the last three are additional individual skills. Subsequent to the survey, each skill was categorised by the authors as representing one or more of the three themes: communication, productivity and relationships. It should be noted that some skills had substantial aspects of two themes and were designated as both.

### **Analysis**

Students were ranked by performance in a group investigation. The top and bottom third of students, designated high and low achievement students, were identified. This identification was an approximate process as particular marks were held by students at and around the one-third rank in some cases, and so the nearest change in mark was used to delineate the groups instead. The frequency of nomination of each group skill was identified for each of the student groups. The similarity of each group to the other groups was evaluated using a Chi-squared statistic. The process was repeated using high and low performance groups identified with students ranked by their combined performance in both exams.

Each student's emphasis on each of the three themes was calculated by assigning a value of one to the theme represented by each of the ten skills they nominated and summing the values for each theme. Where a skill represented two themes, a value of one half was assigned to each skill represented by that theme. As each student nominated ten skills, the sum of the scores for the three themes would equal ten. Because of this interdependence between the theme scores, they were considered using triangular plots, with each vertex representing an emphasis entirely on one theme. Three-dimensional plots were constructed with theme scores in the base (X-Y) plane and the frequency with which each point was nominated in the third axis. Separate plots were conducted for four groups, high and low achievement students when ranked by performance in a group investigation, and high and low achievement students when ranked by combined performance in both exams.

## **RESULTS**

The number of nominations for each skill by students ranked by group investigation performance and exam performance are given in Figures 1 and 2 respectively. Casual observation of the three figures will reveal that a number of features appear to be common across the four student groups in the two methods of assessment. For example, each figure shows a similar pattern of peaks and troughs. There are a prevalence of nominations for skills b, e, f, i, m, n, q and w, with a paucity of nominations for

skills g, l, s and y in both figures. This in itself would suggest that there is a degree of similarity between the high and low achieving students in both types of assessment.

Examination of the differences in the frequency of the nominations given to each group work skill by Chi-squared test found no difference between the nominations of high and low achieving students when ranked by performance in a group investigation ( $p = 0.887$ ) or when ranked by exam performance ( $p = 0.799$ ). This would suggest that, for either assessment type, there are no substantial differences between the high and low achieving student groups in terms of their attitudes toward the 25 group skills, each skill attracting a similar proportion of nominations from each group. Hypotheses 1 and 3 are therefore rejected.

Figures 3 and 4 contain three-dimensional plots for students ranked by group investigation and exam performance respectively. They depict high and low achieving students' relative emphases on productivity, communication and relationship themed skills. The point  $X = 0, Y = 1$  corresponds to 100% Productivity, the point  $X = -0.41, Y = 0$  corresponds to 100% Communication, and the point  $X = 0.41, Y = 0$  corresponds to 100% Relationships. Lines parallel to the line of the triangle opposite each point, give lines of points with equal value for the category represented by that opposite point. So, for example, lines parallel to the X-axis (which is the side of the triangle opposite the productivity vertex, will have the same proportion of Productivity. A line parallel to the X-axis at  $Y = 0.5$ , will represent all points with a productivity emphasis of 50%. Consideration of the points on the base plane shows that the plots are essentially similar within each figure, i.e. they cover the same domain. Consideration of the frequency of each point shows that high and low achieving students have similar frequency distributions except that there appears to be greater clarity regarding the mode of high achieving students in both cases. Hypotheses 2 and 4 are therefore rejected.

In summary, the student perceptions of group skills demonstrate a distinct pattern regarding what students consider to be the most important skills. There is no evidence that what would seem to be



disparate groups of students in terms of academic performance are in any way different in terms of their perception of what are the most important skills for successful social interaction in group work.

## **DISCUSSION**

It is perhaps remarkable that students' perceptions of what are the important group skills are essentially the same. Yet this is the case, for this cohort at least. While this finding is of academic interest, it is also of substantial practical value. The purpose of the study was to examine student's perceptions of what they consider to be the most important group skills, and to identify whether students who are high achievers have different perceptions compared to low achieving students. Having identified that their perceptions are the same, the task of equipping the students is greatly simplified. A single curriculum or intervention program need be developed rather than group specific curricula. Delivery, too, is greatly simplified. Rather than organise classes specifically for each student group, interventions can address the whole, integrated student body in the normal class schedule. The resource implications are substantial.

The skills, ranked from most nominated to least nominated (by high achieving students based on group investigation) were: b, e, q, f, c, m, a, n, i, d, o, w, t, j, h, v, x, p, k, r, s, u, g, y, l. Table 1 contains their descriptions. Delineating these skills into three arbitrary, roughly equal groups by rank, and noting the themes associated with each skill, produces useful insights. Table 2 shows the prevalence of each skill theme in each group, calculated using the same procedure used for producing Figures 3 and 4. A number of points are immediately apparent. Each of the three skill groups has a distinct emphasis on one particular theme, representing 56% to 67% of the overall theme of the skill group. Each skill group has a different emphasis. Students appear to consider productivity skills most important, followed by relationship skills and communication skills.

More detailed examination of the top nine skills group reveals that seven of the possible nine productivity-themed skills are included in this group. The two that were not included were skill g -

'showing others how to do things' and skill h - 'supporting others in new learning tasks'. The low importance set on these two skills may be interpreted as either their being unnecessary as group members already have the skills needed or as an intolerance of group members who are not fully equipped to contribute, and so unable to 'pull their weight'. It is not possible to tell which is correct or whether both are, however if students are intolerant of under-equipped group members, the importance of training students in group skills and the specification of subject prerequisites is underlined. Of the four skills in this top nine group that have communication or relationship themes, only two were not considered to have a productivity component, skill c - 'negotiating ideas and coming to joint decisions' and skill q - 'listening to one another'.

The middle eight skills group is predominantly themed relationships, however with only a vestigial productivity theme, it could be considered relationships and communication themed. The position of the communication theme relative to the other themes could be argued. With communication themed skills in the top nine and the middle eight, if these two groups were considered together one might suggest that there is an almost equal emphasis on relationships and communication. However, with half the communications themed skills in the bottom eight skills group the position is difficult to support. It would be more reasonable to recognise the inclusion of communication skills in the top two skills groups by noting that aspects of communication are considered important by students. With more than half of the relationship themed skills contained in the middle eight skill group, the ranking of the relationships theme is evident.

## **CONCLUSION**

The results of this study give clear indications of student's views of what collaborative learning skills are considered important by them. At a general level, skills relating to the productivity of the group would be the most prevalent concern, followed by skills related to relationships within the group and then skills concerned with communication among group members. Specifically, the highest concern was for skills relating to setting goals and working out strategies for reaching goals.

Differences between degree or language background or academic performance groups' perceptions of the relative importance of various skills would suggest that, to facilitate their collaborative learning, differing groups warrant separate treatment in terms of learning group selection and skills training. However, this study finds that although there are substantial differences between the people, and in particular their academic performance, their attitudes toward the relative importance of particular group skills are, in fact, relatively homogeneous.

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### **REFERENCES**

- Boud D (2001) Introduction : making the move to peer learning, in Boud D and Cohen R (Eds) *Peer learning in higher education : learning from and with each other*: 1-17, Kogan Page, London.
- Bourner J, Hughes M and Bourner T (2001) First-year undergraduate experiences of group project work, *Assessment & Evaluation in Higher Education* 26(1): 19-39.
- Bridges P, Cooper A, Evanson P, Haines C, Jenkins D and Scurry D (2002) Coursework marks high, examination marks low: discuss, *Assessment and Evaluation in Higher Education*, 27: 35-48.
- Burdett J (2003) Making groups work : university students' perceptions, *International Education Journal* 4(3): 177-191.
- Campbell J and Li M (2006) Asian students' perceptions of group work and group assignments, in a New Zealand tertiary institution in Renner J, Cross J, and Bell C (Eds) *Engagement and empowerment: New opportunities for growth in higher education*, EDU-COM 2006 Conference: 78-89, Edith Cowan University, Joondalup WA.
- Cohen E (1994) *Designing Groupwork 2nd ed.*, Teachers College Press, New York.
- Downs CT (2006) What Should Make Up a Final Mark For a Course? An Investigation into the Academic Performance of First Year Bioscience Students, *Assessment and Evaluation in Higher Education* 31: 345-364.
- Ehrman M and Z Dornyei (1998) *Interpersonal dynamics in second language education*, Sage, Thousand Oaks.
- Ellem G (2007) *Group work : horses for courses in first year biology*. Symposium Proceedings of the Uniserve Science teaching and learning research including threshold concepts Symposium: 126-131, Sydney : UniServe Science, Sydney NSW.
- Fletcher JF and Stren RE (1989) Language skills and adaptation: A study of foreign students in a Canadian university. *Curriculum Inquiry* 19(3): 293-308.
- Gerstman J and Rex J (2003) Understanding group learning processes in university business classes, *International Journal of Learning* 10: 459-471.
- Hendry GD (2002) Tutors' perceptions of dysfunctional behaviour in problem-based learning tutorial groups, *HERDSA News* 24(1): 27-30.
- Johnson D and Johnson R (1995) Cooperative learning and non-academic outcomes of schooling: The other side of the report card, in Pederson J and Digby A (Eds), *Secondary Schools and cooperative learning: Theories, models and strategies*, 81-150, Garland, New York.

Nelson RE and Bass KC (1994) Managed group information: An approach to team formation in policy courses, *Journal of Education for Business* 70(1): 25-29.

Norton D (2007) *Promoting group participation : a conscious approach to collaboration*. Diversity : a catalyst for innovation: EA Conference, 13-15 September, EA, Sydney NSW.

Payne BK, Monk-Turner E, Smith D and Sumter M (2006) Improving Group Work: Voices of Students, *Education* 126(3): 441-448.

Pauli R, Mohiyeddini C, Bray D, Michie F and Street B (2008) Individual Differences in Negative Group Work Experiences in Collaborative Student Learning, *Educational Psychology* 28(1): 47-58.

Slavin RE (1996) Research on cooperative learning and achievement: What we know, what we need to know, *Contemporary Educational Psychology* 21: 43-69.

Strauss PUA (2001) "I'd Rather Vomit Up a Live Hedgehog" - L2 Students and Group Assessment in Mainstream University Programs, *Prospect* 16: 55-66.

Straus PUA (2007) Group assessments : dilemmas facing lecturers in multicultural tertiary classrooms, *Higher Education Research and Development* 26(2): 147-161. White F, Lloyd H and Goldfried J (2007) Evaluating student perceptions of group work and group assessment, in Brew A and Sachs J (Eds) *Transforming a university : the scholarship of teaching and learning in practice*, 71-80, 255-285, Sydney University Press, Sydney.

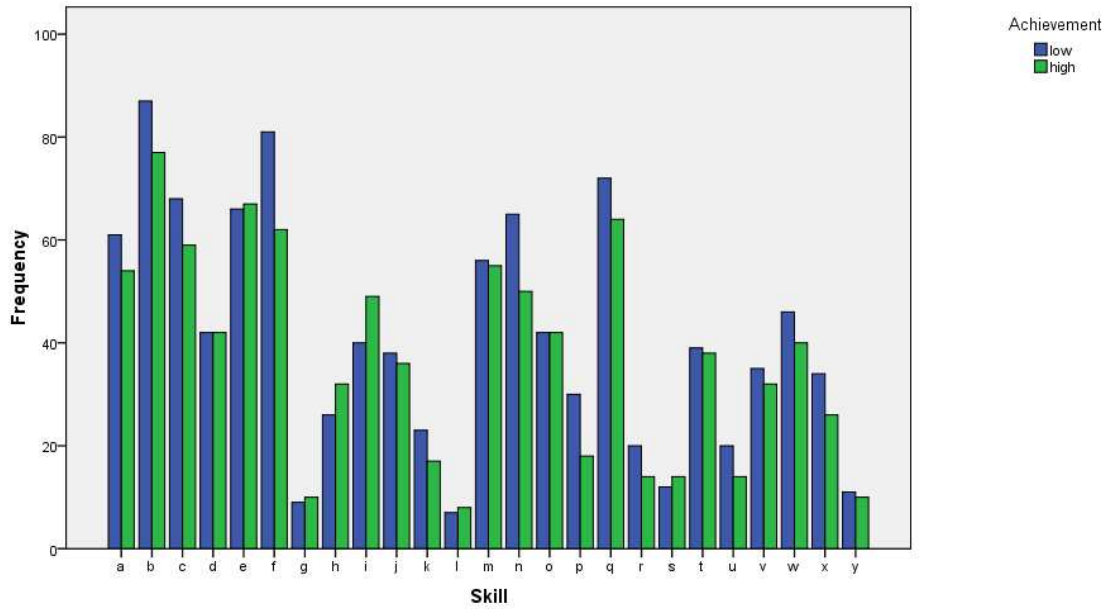
**Table 1 Collaborative Learning Skills and Their Themes**

	Collaborative Learning Skill	Theme
a	setting out clearly and revisiting the purposes of the activity	productivity
b	setting goals; working out strategies for reaching goals	productivity
c	negotiating ideas and coming to joint decisions	communication, relationships
d	working out compromises; developing a consensus	relationships
e	organizing and coordinating other people	productivity
f	setting time limits; drawing attention to these	productivity
g	showing others how to do things	productivity
h	supporting others in learning new tasks	productivity, relationships
i	giving constructive feedback	relationships, productivity
j	critiquing ideas without criticising people	relationships
k	managing conflict by discussing differences	relationships
l	expressing disappointment/frustration/anger/ using "I feel..." statements rather than "You..." statements	relationships
m	encouraging others to contribute	productivity
n	making suggestions	communication, productivity
o	asking for other people's opinions	communication, productivity
p	asking for help, or clarification	communication
q	listening to one another	communication
r	reflecting on what has been said	communication
s	giving reasons	communication
t	giving explanations: saying how and why	communication
u	paraphrasing and clarifying other people's contributions	communication
v	summarizing the ideas of the group	communication
w	tolerance – of differences in team members' personal styles	relationships
x	empathy (ability to identify with others' viewpoints)	relationships
y	persuasive power	communication

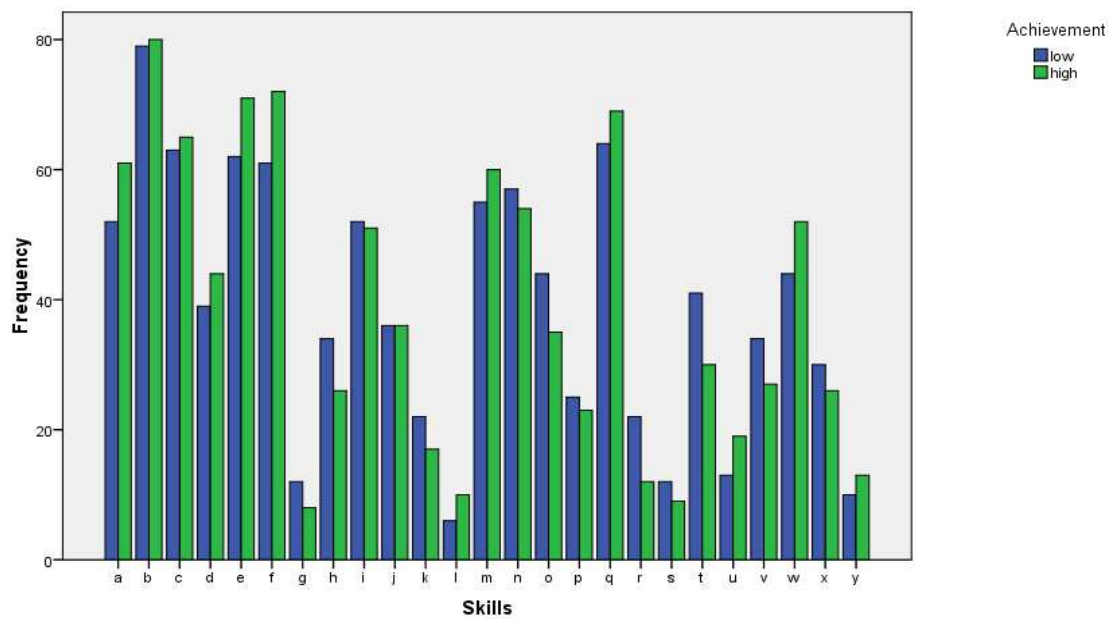
**Table 2: Prevalence of Skill Themes in Three Skill Groups**

Skill Category	Theme of Skills		
	Productivity	Relationships	Communication
Top nine skills	6	1	2
Middle eight skills	0.5	4.5	3
Bottom eight skills	1	2	5

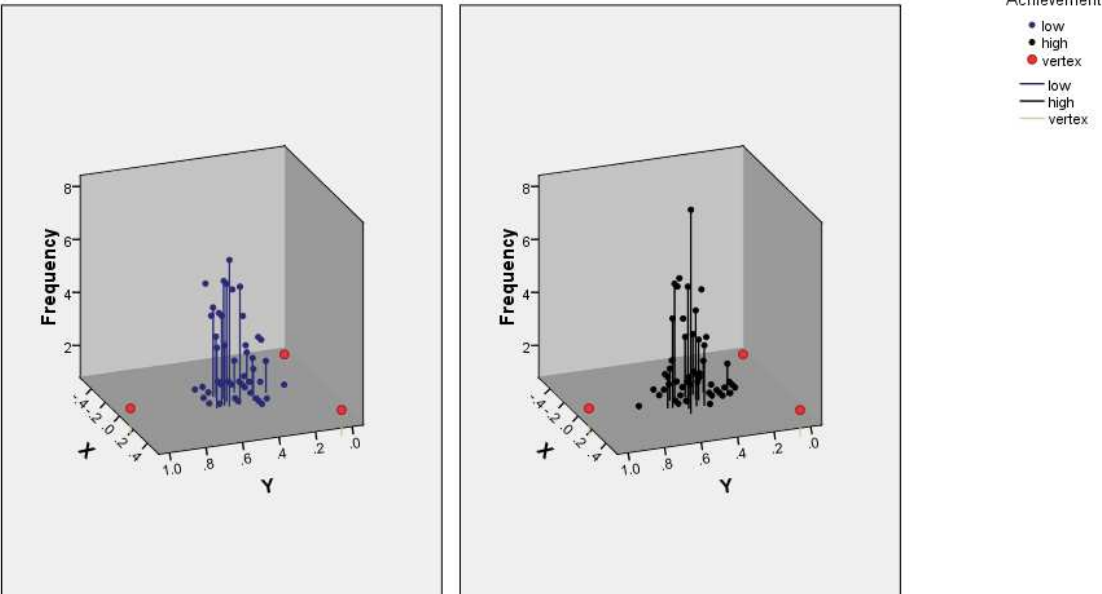
**Figure 1: Group Skill Nominations by High and Low Achieving Students When Ranked by Performance in Group Investigation (Pearson Chi-Square,  $p=0.887$ )**



**Figure 2: Group Skill Nominations by High and Low Achieving Students When Ranked by Performance in Exams (Pearson Chi-Square,  $p= 0.799$ )**



**Figure 3: Three-Dimensional Plot of High and Low Achieving Students' Relative Emphases on Productivity, Communication and Relationship Skills Base on Group Investigation Performance**



**Figure 4: Three-Dimensional Plot of High and Low Achieving Students' Relative Emphases on Productivity, Communication and Relationship Skills Based on Exam Performance**

