

TEACHING STUDENTS TO MANAGE TEAM LEARNING AND IMPROVE TEAMWORK SATISFACTION

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Abstract

Tertiary educators have adopted teamwork strategies to improve educational outcomes and prepare students for working in industry. Teamwork teaches students valuable interpersonal skills and can enrich graduate attributes of problem solving, communication skills, ethics, and critical analysis as students learn to work with others and learn from each other. Unfortunately, this reality is undermined when relations breakdown and conflict inhibits learning outcomes. This paper reports on an action research study over two years, investigating student satisfaction among second-year management students. The students are educated on team development and strategies for managing team processes and conflict. Findings suggest that satisfaction is enhanced if students are taught to manage the processes of teamwork, and they take greater ownership for managing conflict and team relations.

Key words

teamwork, team development, conflict management, learning styles, action research, collectivism.

In response to industry requirements, higher education has embraced teamwork across the curricula on the basis that this will prepare students to work in teams when they enter into the workforce. However, in practice students often struggle to manage course content and team processes, as they attempt to juggle the competing agendas associated with outside work commitments, timetables and meeting course requirements, which in turn diminishes satisfaction with learning experiences and increases stress levels (Ohl and Cates, 2006). Further, differences in learning styles (Mumford, 1995), experience, personality (Ohl and Cates, 2006), personal preferences, perceptions and the teams relational dynamics (Anderson, 2005), also influence individual satisfaction with teamwork. All too often, the outcome is a group of individuals completing components of the task, not teamwork. This distinction between individuals in a group and a team is important because if the aim is to achieve a synergistic outcome, then we need to create teams so that individuals work toward a shared and common goal. An obvious concern when teamwork breaks down is that this will contribute to poorer educational outcomes. Acknowledging that the variables influencing teamwork are wide-ranging, our aim was to identify strategies for better management of teamwork, so that student satisfaction and learning outcomes could be improved.

This paper reports the findings of two studies investigating student satisfaction with teamwork over a two-year period in 2004 and 2005. We used an action research approach to collect data at the beginning and end of the second semester for each year. Feedback from data collected at the beginning of the semester was returned to the students to inform their management of teamwork throughout the semester. Students were educated about the concepts and processes of teamwork, including the contributions of individual attributes and roles, and the stages of team development. The students worked in teams throughout the semester and were required to plan and

implement strategies to overcome potential problems. This included developing protocols in the form of team rules and conflict resolution procedures to manage their interactions. Teams were monitored throughout the course of study and students were encouraged to reflect on their progress in terms of content and process. This required the teaching staff to reflect on their own teaching practices and adjust in consultation and cooperation with the students (Diamond, 2004; Kuit, Reay and Freeman, 2001). Feedback from students and their satisfaction with aspects of the course at the end of 2004 informed the process for 2005. The overall results suggest that setting very clear boundaries for managing team processes and involving students in evaluating their progress can lead to improved student satisfaction with learning while working in teams.

Background

Team learning has been adopted by higher education for a number of very positive pedagogical and practical reasons. Predominant among these reasons are, firstly, the team environment promotes cooperation and collaborative skill development (Portwood, 1999; Yazici, 2005) and should teach valuable interpersonal skills students will require for their future working life (Mutch, 1998). Secondly, shifting the onus for exploring and understanding information to the students encourages them to take greater ownership of their learning (Towns, Kreke and Fields, 2000). Thirdly, the sharing of knowledge among peers builds individual levels of knowledge so that students learn from each other, which in turn promotes a community of learning (Towns et al., 2000). This occurs because teamwork in a relatively safe learning environment benefits students' relationship skills through improved communication, conflict resolution and negotiation skills, which in turn builds self-efficacy and self-worth, all of which helps them adapt to working with others (Portwood, 1999).

Team discussion encourages students to explore different perspectives, which means they are more likely to understand the content they are dealing with, so deeper learning can occur. This occurs because students share and explore content knowledge as well as specific information or experiences on how to implement processes to help develop problem solving and critical thinking skills (Mutch, 1998). For example, Yazici (2005) identified that students were able to lift each others written and oral communication skills by sharing and challenging both content and process. Finally, Kolb (1984) identified that individuals usually have different preference combinations as to how they learn, which include combinations of learning by observation, doing feeling and thinking, and team learning provides recognition of these different learning styles (Towns et al., 2000). Working in teams provides an opportunity for students to contribute from their strengths in line with their preferred learning style, so that they achieve better individual outcomes (Mutch, 1998).

The benefits of team learning are borne out in a meta-analysis of 39 studies into small team learning conducted by Springer, Stanne and Donovan (1999). This research found that learners in small teams achieved better outcomes in terms of their problem solving abilities, self esteem and learning outcomes overall. Likely reasons posited for these outcomes were a higher level of engagement with the material in a problem-solving manner, commitment to other team members and the team process. Nonetheless, anecdotal evidence and our own experiences suggests the reality for many students falls short of achieving these outcomes and some researchers question

whether working in teams actually benefits educational outcomes in practice because of the problems that can arise (Mutch, 1998; Ohl and Cates, 2006).

The problems that occur for students doing teamwork often fall into one or more of the following three categories, these being the team process, member expectations and the logistics of coordinating team activities (Townes et al., 2000). Firstly, the processes the team establishes to manage their interactions is critical for success and these processes need to take into account the task design, member roles, conflict, coordination and leadership, member expectations and conflicting personal agendas (Ohl and Cates, 2006; Townes et al., 2000). Identifying and dealing with these in the formative stages of the teams' development can go a long way to minimizing problems. Secondly, problem occurs when individual team members have differing expectations. Expectations can vary in relation to differing student perceptions (Anderson, 2005) of such issues as the assessment requirements, learning objectives or the need to balance other roles such as those between study, work and family. Thirdly, the sheer logistics of coordinating timetables, meeting times, workloads and managing technology incompatibilities, to name a few, can pose a challenge to students so the size of a team is an important consideration (Lou, Abrami, Spence, and Poulsen, 1996). All or any of these factors can precipitate conflict among members and one of the most commonly cited courses of conflict is the perception that some members are taking advantage of others.

The perception that some team members are putting in more effort than others is referred to as *social loafing* or *free riding* (Butterfield and Pendergras, 1996). This occurs when some team members believe that they are carrying other team members by doing more than a fair share of the work (Karau and Hart, 1998). One of the reasons this occurs is because individuals perceive themselves as less identifiable or accountable within the group because resources and gains are shared (Guerin, 2003). Perceptions of inequity arise and create tension that can de-motivate team members and erupt into conflict. Wagner (1995) suggests *free riding* is less likely to occur among collectivists because they tend to focus on the team outcome and will put the teams' needs ahead of their own. This is in direct contrast to individualists, who are more likely to focus on their own needs and be less concerned about repercussions for the team (Triandis, 1995). This distinction between individualism and collectivism, where individuals either prefer to identify themselves as separate entities from others if they are individualistic or see themselves as being situated in a social context if they are collectivist, draws on the cultural dimensions of Hofstede (Triandis, 1995). However, the reality is that even within cultures, individuals can have different preferences. Recognizing this difference is important when considering students; particularly as students know they need to achieve the best grades they can to maximize their employment prospects. Students who have an individualist preference are less willing to share their endeavors with others, as they either do not want to suffer any disadvantages for being in the group and prefer to complete tasks the way they want to do them and achieve on their own merit. On the other hand, those with a collectivist orientation are willing to cooperate and collaborate to achieve an outcome that benefits the whole group, even if it means some loss to them as individuals. Interestingly, McFeeters (2002) conducted a study of 207 graduate students from differing cultures and claims that those motivated by collectivist orientations also achieve deeper learning outcomes.

While organisations are able to overcome differences in motivation to work in teams, the reality is that different motivators and penalties apply in the workforce (Butterfield and Pendegraft, 1996) than in the university setting. Nonetheless, similar strategies can be applied to build member motivation; these include having small sized teams, allowing members to have specialized tasks and building in ways of measuring individual performance outcomes. (McShane and Travaglione, 2006). In addition, Karau and Hart (1998) recommend building in learning strategies and challenges that maintain some individual focus to overcome the differences between individualists and collectivists.

A similarity between work and student teams that students relate to is that members can capitalize on each other's strengths as learners and gain richer outcomes. Teamwork provides members the opportunity to divide work in ways that allow greater flexibility for individuals to match their preferred learning style. The experiential learning model proposed by Kolb (1984) suggests that learning occurs through a cyclical pattern of experience, reflection, generalization and application. However, in the learning environment of a university this can often be limited, particularly if students have little exposure or experience to understand how theory is generalizable and applied. Honey and Mumford (1995) developed Kolb's model further and suggested that individuals also have a preferred style of learning, that is more heavily weighted towards a preference for learning by doing, observing, feeling and or thinking. These translate into learning preferences where learners are classified as accommodators (who prefer learning by doing and feeling), divergers (who prefer learning by observing and feeling), convergers (who prefer learning by doing and thinking) and assimilators (who prefer learning by observing and thinking). Differences in learning preferences can undermine the team's performance, or when managed well, can add value to the team's learning outcomes.

Successful teams are cohesive teams

For teams to be productive and work effectively, Ohl and Cates (2006) suggest that individuals need to feel connected to each other and have a sense that they are working toward a time-bounded, shared goal. This view recognizes the interdependence among members, however this will only work if each member acknowledges and accepts the responsibility of sharing in and completing any given task (Wageman and Frederick, 2005). Generating shared experiences and goals build cohesion, which is at the heart of a teams' effectiveness. Given the range of pressures students face, having processes and rules to help manage their activities and shape their relationships also helps them successfully complete the task (Wageman, 1999). As mentioned earlier, students face competing demands and deal with a wide range of agendas, so deliberate team building strategies can be used to develop and strengthen the unity and trust among members. This supports the relationships, which in turns makes it easier for students to learn from each other (Humphreys et al., 1997). Butterfield and Pendegraft (1996) suggest that teamwork and success are the result of effective relationships developed through self-disclosure and sharing knowledge. Therefore adopting strategies to assist team members build better relationships benefits performance overall and is the first step to converting a group into a team. This requires educating students on the difference between a group and team, and the processes and strategies they can use to manage both relationships and the task more effectively.

Theoretical frameworks for understanding and managing teamwork.

To be effective teams need an understanding of how teams develop, the different roles members adopt and how to deal with conflict. Armed with this knowledge, they can set up processes that recognize the need to manage interactions relating to both the relationships and the task. Two very useful models to help achieve this are the Tuckman and Gersick Models of team development. The Tuckman model proposes that teams go through five developmental stages, these being forming, storming, norming, performing and adjourning (Tuckman and Jensen, 1997). The first three stages are the most problematic in terms of developing a working relationship among team members. Negotiating these first three stages lays the groundwork for members to work together productively and achieve the fourth, then fifth stages of the model. Nonetheless, problems can arise.

The first set of problems arises at the forming stage when team members seek acceptance and agree to criteria that makes them acceptable to other team members. At this stage, students are likely to over estimate the contributions they can make to the team so that unrealistic promises are made, albeit with the best of intentions. The second stage of storming occurs when conflict occurs because of the practical realities of working together. Any number of issues can lead to conflict but often it is about leadership, choice of methodology and personal agendas. Rivalry occurs as members seek to establish a pecking order of how they will work together. Interpersonal dynamics start to establish and if problems arise, they are exacerbated as team size increases (Lou et al., 1996). This is when political behaviour emerges in the form of either lobbying or the formation of coalitions. Students need to understand this is an important stage in developing robust debating skills. The point here is to encourage students to view conflict among members as a healthy process to improve decision-making and debate, rather than perceiving the cause as problem members.

Rather than avoid conflict, students should be encouraged to view this as an opportunity to achieve two specific and distinct outcomes. One is the opportunity to add greater depth and richness to their understanding of content material. Therefore, they need to learn how to deal with conflict and one way of doing this is to keep their focus on the outcome. For example, if someone is late or slow with their work, discussion needs to focus on how this affects their goals and what needs to be done to achieve the goal, rather than blaming or attacking the individual. The second outcome is that conflict provides an opportunity to explore issues of process and establish boundaries that all team members can work within. On the one hand, team members should be held accountable to these agreed boundaries and have checkpoints in place as recommended by Kahns (1995) and Knabb (2000), but on the other hand, members can mutually agree to amend these should circumstances warrant this. If conflict is ignored or not dealt with, it is likely to erupt when the team is under pressure, undermine member relationships and lead to the breakdown of team relations.

The time pressures a student faces when completing projects, often within different teams and across a number of different subjects, means that little time is spent on developing relationships to a level that allows the team to be effective. Students are expected to perform to very tight timelines and often try to launch into completing a task when relationships among team members are still at the forming stage where expectations are unrealistic. In this scenario, it is not surprising that problems emerge and students become frustrated so that grades and satisfaction are both compromised.

Rather than establishing robust team norms, compliance masquerades as cooperation or collaboration and dysfunctional norms emerge and ultimately undermine the ability of the team to perform. To manage this stage, the student teams in this study were required to develop and agree to a set of team rules and these rules needed to contain dispute resolution process for dealing with problems that could arise. This replicates the practice of establishing ground rules that is so common in industry (Mutch, 1998). We believe the rules need to provide clear operating boundaries with specific, actionable steps for managing the teams' processes and shaping appropriate norms to support performance.

The third stage of *norming* occurs when team members have established *norms* or patterns of behavior that allow them to work together. The purpose of norms is to establish boundaries that shape what members can expect of each other. These boundaries can be shaped in a formal sense by rules and agreed processes, or informally through a psychological contract, which is influenced by perceptions of reality, rather than reality itself. When conflict is not dealt with, the team might appear to be working well together, but in reality, the relationships are quite fragile. The risk in establishing norms too quickly is that the need for unity within the team takes precedence to challenges to ideas and processes so that members subjugate their ideas or concerns merely to allow the team to achieve its outcome (Tuckman and Jensen, 1997). Not managing the two preceding stages increases the risk of dysfunctional patterns or norms of team behaviour that undermine the teams' ability to perform effectively.

The performing stage is when all team members are focused on achieving the task and working toward the same end. Members gain the benefits of participating in teamwork if the foundations are well laid. When the team is successful and works well together, the final adjoining stage reflects a period of sadness at the team breaking up once the task is completed. The second model of team development worth understanding is the Gersick, or Punctuated Equilibrium Model (Gersick, 1991). This model differs from Tuckman's Model as it suggests teams have a period of inertia followed by a period of activity. A parallel between the two models is that they focus on performance in the latter stages and Tuckman's first three stages, in common with Gersick's period of early inertia, is oriented towards laying the groundwork for the task to be completed. These models demonstrate to students that they must manage both the task and relationships. Viewing conflict and problems as part of the process allows students to focus on issues rather than individuals. This brief review of the literature has led to the development of the three following hypotheses.

- H1. Team member satisfaction will be positively influenced by having clear team processes that provide boundaries and information to manage each team's development.
- H2. Secondary to the first hypothesis is that where students have clear boundaries and information to manage the team process they should be no difference between those with a collectivist or individualist orientation.
- H3. Having a clear process for managing conflict in the team will reduce conflict and promote member satisfaction.

Methodology

Procedure: The study was based on multiple survey data collected from second year undergraduate students over a two-year period. The respondents were participating in a management course so the processes also linked to course content material. This course explores how modern organizations operate and deal with change, making it ideal to model the interpersonal and teamwork skills needed to prepare students for their role in the workforce. The students were keen to participate in the study as they could see the link between their academic learning and practical workforce application. Data was collected in weeks 2 and 13 to replicate before and after surveys used in organizational settings. The aim was to provide students with information they could operationalize within their teams during the course and feedback at the end of the course. Feedback on results was not meant to be prescriptive, but was aimed at giving students the language and awareness to discuss their strengths and weaknesses as team members and help them identify strategies to harness individual skills and attributes to overcome weaknesses and achieve better performance.

Feedback from the first survey informed the realignment of student behaviors and the establishment of team rules and conflict resolution processes. While these processes and practices can be found in other literature on teamwork, we believe it is important to recognize that process and content are separate but convergent issues. The Tuckman and Gersick models help students to become aware of this when they are asked to explore their previous experiences of teamwork within the context of these models. This elicits both positive and negative feedback, which forms the basis for exploring the different roles that members contribute to promote or undermine a team's success. The first workshop focuses on team building exercises so students learn about others in the class. In addition, short team-building activities in the form of icebreakers that the students contribute, and team reviews are conducted regularly throughout the semester. Teams self-select and form over the first couple of weeks, however team projects do not commence until four to five weeks into the course.

During the first three weeks information about team member roles, processes for managing teams and conflict management are explored to assist students establish team rules and conflict management processes. Team progress in terms of content and process are reviewed on several occasions throughout the semester. Students use the conflict resolution process to deal with any problems and individual members know that continued non-compliance or problems can lead to their expulsion from the group if problems are not resolved. This only occurs after discussion with the class facilitator or coordinator and removing a member from a team close to an assignment submission date only occurs in extraordinary circumstances. Where an individual leaves or is excluded they can take shared teamwork up to that point but must complete the assignment on their own. Peer feedback forms a small component of the assessment and if there are significant discrepancies in the peer grades allocated, final grades may be adjusted by the course coordinator.

Methodology

Data was collected at the first and final workshops of the thirteen-week semester, for both years. Responses were captured on Likert type Scales, where 1 signified very negative or no; 3, signified neutral or unsure; 5 signified very positive or yes. Confidentiality was protected with "secret student numbers", the original responses

were held by the students, and responses transferred to computer read marking sheets. This allowed students to check their individual responses against the class aggregate.

The first set of data collected in the 2004 used 70 items. The measures included fifteen items to measure preferences for Competing, Collaborating, Avoiding, Accommodating and Compromising. These were taken from an abbreviated version of Rahims' (1983) thirty-five item instrument, which Coyle (1994) identified as having robust psychometric properties. An example of one of these questions was "*I will negotiate so that a compromise can be reached*". Collectivism versus individualism was measured using five items per scale; these were adapted from the scale developed by Triandis (1995). An example of an Individualism question was "*I do better work by myself*", whereas a collectivist question was "*I like to be able to access the ideas of other people to add to my own*". Cooperation and versus independence was measured with two eight item scales drawn from Barnes and Owens [1992]. An example of a co-operation question was "*It is important for me to maintain harmony within my team*, while an Independence question was; "*I think competition is the law of nature*". Learning style preferences were measured with ten paired items, adapted from Kolb (1985) and in Lussier and Poulos (1998). Respondents weighted their preferences for Observing and Doing, or Feeling and Thinking. For example, a measure for Observing was "*I am careful*" and a measure of Doing was "*I am practical*"

The data collected in 2005 excluded measures found to be either of little significant value or problematic in the previous year. The measures of Independence and Collectivism, Cooperation, Independence did not identify significant variances within and across the cohort; these were excluded the second year and substituted with measures that tapped emergent issues. The first survey measured five traits related to team effectiveness, these being communication, interpersonal, aspiration and achievement, problem solving, and leadership skills and was drawn from Brown and Harvey (2006). The follow-up end of semester surveys for both years contained 13 items and measured team member satisfaction with learning and conflict management. Throughout the semester students in both years indicated that I-lecture recording of lectures was used to the clarify issues that could potentially lead to team conflict so use of this resource was also measured. A summary of the data collected for the two studies is presented below in Table 1.

Insert Table 1 about here

Results 2004

In 2004, 196 students responded at the beginning of term; 151 were studying in Australia and 45 were in Malaysia. The end of term survey for this class returned 164 responses and of these, 131 and 21 from Australia and Malaysia respectively were matched to individual respondents from the first survey. More males (107) responded in 2004 at time 1 than females (89); however, the ratios were comparative at the second survey with 80 females and 84 males responding. Means and standard deviations for responses are presented below in Table 1 and show higher preferences for co-operation over independence, collectivism over individualism and the highest conflict handling style preference was collaborating, closely followed by compromising and accommodating. Learning style preferences returned a higher

preference for thinking, followed by observing, doing and feeling. T-tests of difference between the Malaysian and Australian students, and males and females indicated that the only significant difference was that female students, expectedly, indicated a higher preference for a feeling style ($p \geq .05$). Cluster analysis indicated that having an observing learning style preference was opposed to having a doing style, whereas the feeling style was opposed to a thinking style, however the normalized data suggested the students learning preferences were relatively evenly distributed across all four categories as shown below in Table 2.

Insert Table 2 about here

There were no significant differences between those who responded in the first wave of the study and the matched sample. Although a Cronbach Alpha of above .7 is the preferred measure for internal consistency, values close to this benchmark can be accepted as reasonable measures of reliability (Hair et al., 1998), particularly as this was an exploratory study. The reliabilities for this study were close to this benchmark, with the lowest reliability being for Independence at .65 and the highest being .71 for Individualism. In addition, students also provided feedback on their satisfaction with other team members' contributions to their team project. Satisfaction with each individual team member was rated on a Likert scale of one to five, in ranked order. These single item ratings identified that as team size increased satisfaction with the individual member's contribution decreased. The satisfaction mean for 1-3 members was between 4.4 – 4.1; this declined to 3.8 for the fourth member and dramatically and significantly declined for the fifth member to 1.5 ($p < .000$) as shown in Table 3.

Insert Table 3 about here:

Next, we conducted a correlation analysis of the matched data at the start and end of semester, which indicated females were more likely to access information from Web CT and had a higher preference for collectivism and integration than males, as shown in Table 2. The use of I-lecture related significantly to managing team processes, and team processes significantly correlated to satisfaction. The results suggests satisfaction was not affected by gender, age or having work experience. As expected, working and older students were more likely to be studying part time and those with high levels of independence were less likely to prefer learning in cooperation with others or teamwork. support of the cluster analysis findings on learning styles, having a thinker style, strongly negatively correlated with having a feeling preference, whereas having an observing style, negatively correlated with a doing preference. The results of the correlation analysis are presented below in Table 4.

Insert Table 4 about here

Results 2005

The 2005 data set only comprised Australian students and was therefore smaller, with 114 (59 female and 55 male) students responding to the first survey and 99 (53 female and 46 male) responding to the second survey. One issue that emerged in discussions with students in 2004 was that, apart from the importance of processes, the roles members took during the course of the semester influenced team satisfaction. Some felt it was important to have a leader or coordinator and these roles could even rotate among members. The central issue though, was that if each had roles they were suited to, they could make better choices about fulfilling the role. Therefore, the 2005 survey targeted attributes that individuals bring to their roles in the team. The aim was to promote students awareness of what they brought to the team to help or hinder teamwork. The attributes raised in the survey included, Leadership, Communication skills, Interpersonal Skills, Problem Solving, and Aspiration / Achievement (Brown & Harvey, 2006). Table 5 below presents means, standard deviations, reliabilities and correlations for these measures.

Insert Table 5 about here

These results show the students rated themselves most highly for their interpersonal and communication skills, closely followed by aspiration and achievement, problem-solving skills, and leadership skills. Taken together, these results bode well for cooperation between the students when participating in teamwork. Cronbach Alpha reliabilities for the factors were assessed, with the highest being for Leadership ($\alpha = .75$), closely followed by Problem solving ($\alpha = .73$) and Aspirations ($\alpha = .68$) and although lower, the reliabilities for Communication and Interpersonal skills ($\alpha = .65$) were still acceptable. The correlation results show important relationship between the traits. These infer that the only traits not significantly related were Aspiration / Achievement with Interpersonal skills. Next, we conducted independent sample t-tests to examine for differences in traits between male and female students. Males rated themselves significantly more highly than females as leaders ($p \geq .01$) and also indicated they thought they were more independent, had better interpersonal skills and were better problem solvers ($p \geq .051$).

Comparisons between 2004 - 2005

Next, the outcomes in relation to team satisfaction at the end of both years were compared between the two student cohorts and the means and standard deviations are presented below in Table 6. Although the means measuring student satisfaction for the second year of the study were slightly higher, t-test comparisons indicated the only significant difference was that students in the second year of the study placed less reliance on using team rules to manage the team ($p \geq .001$), and their conflict resolution procedure ($p \geq .005$). This outcome is likely a response to some changes in the way the teams were managed, with more time allocated to manage teams in class, under supervision. It was also interesting to note student satisfaction with teamwork in this course rated more highly than in other courses ($p \geq .001$). While acknowledging that many other variables could affect this result, it does suggest that refining some of the team management strategies based on the previous year's student's feedback had a positive impact.

Insert Table 6 about here

Table 7 below presents a comparison of the correlations of student satisfaction outcomes between the two years. Both years contain a number of strong correlations and show that teamwork satisfaction in this course has a strong correlation with the ability to coordinate the team's activities, relationships among the team members and the learning outcomes. Teamwork satisfaction in this course also has a strong correlation with satisfaction in other courses. Teams in both years valued having rules and indeed used the conflict resolution processes built into the rules to manage conflict. One difference identified between the two years was that satisfaction with time to coordinate the team's activities was higher in the second year. This seems likely to be an outcome off some of the changes made in response to feedback in 2004. Students in 2005 were allocated teamwork time in their workshops and these results suggest this allowed them to better coordinate their activities, held members more accountable and allowed earlier intervention which in turn reduced the need for conflict resolution. These results show significant correlations between satisfaction, the ability to manage the team process and learning outcomes. This not only provides strong support for the continued use of team learning, but also demonstrates the value of providing students with the skills and support to manage the process.

Insert Table 7 about here.

Discussion

The key findings of this study provide a number of insights into how we can better manage team learning in the higher education environment. Our experience suggests that following a strict program of team management gives the best outcomes. Our findings support the recommendations and findings from Lou and colleagues (1996) meta-analytic review, which indicates a team with three to four members has fewer problems and is most favourable for satisfaction and learning outcomes with teamwork. Size is important, as it needs to be in proportion to the task and time period students need to complete the project and still allow for developing member relations and skills to manage the team processes. Progress reviews along the way are also extremely useful, as they allow for early intervention so emerging problems can be dealt with as part of the process, before they escalate into perceived conflict. Quite apart from the task, team roles, personal agendas and interactions also contribute to incompatibilities among team members and social loafing behaviour (Butterfield and Pendergraft, 1996; Guerin, 2003). If students can identify and deal with these early in the process, the problems are usually overcome and member relationships are strengthened.

It is critical students understand and appreciate that developing interpersonal skills is the most important value of teamwork (Magin and Churches, 1989; Portwood, 1999; Towns et al., 2000) and it is these skills for sharing knowledge that make teamwork effective in improving scholastic outcomes (Yazici, 2005). The results indicate that students do recognize the value of teamwork. The recognize that it provides a forum

for discussion and debate that enriches their learning outcomes and the experience of working in an interdependent environment will be useful in the workforce. This lends credence to the meta-analysis results of Springer et al's. (1999), which indicated that teamwork not only improves overall outcomes and problem-solving, but also builds self-esteem. Given that students can find it difficult to manage the sheer logistics of teamwork, they are given the option of working independently, if they can present a case for this. Students appreciate that their differing circumstances are recognized and this makes them more thoughtful about their choice of working in a team, rather than cause them to opt out of teamwork. Giving students a choice mimics the reality of modern workforces, where the value of employee involvement and empowerment is recognized by management (Causon, 2004; Costello, Brunner and Hasty, 2004; Kotter and Cohen, 2002). Students also report they feel greater confidence, responsibility and ownership when they are empowered by having this choice.

The problem of motivating and maintaining team performance has received much attention in the management literature as it is a major challenge for industry (McShane and Travaglione, 2005). The study brings together suggestions from the disciplines of education, sociology, psychology, organizational behaviour and management, on how to manage the team-learning environment. Educators can draw on the experience of organizations by recognizing that giving individuals greater awareness of the team process also empowers them to assert more control over their own actions. One very important lesson drawn from the theories around team development and the Tuckman (Tuckman and Jensen, 1997) and Gersick (1991) models is that conflict, power struggles and differing expectations are part of the process that facilitates the team being able to perform effectively. It can be extremely liberating for individuals to view problems in the team's development as part of the process that help build stronger and more robust dynamics, rather than just seeing problems as being created by "problem people". For as Ohl and Cates (2006) rightly point out, cohesiveness among members is critical for successful performance. Similarly, getting students to view conflict as a constructive process for generating a wider range of views and expanding innovative thinking encourages debate about issues and negotiation. Learning how to manage conflict enriches the decisions, choices and learning of the team.

A range of other findings emerged throughout the study. The first of these is that those with individualistic tendencies were less likely to want to participate in the team process, because they believed they perform better on their own (Triandis, 1995). The critical issue here is that these individuals need to be convinced that they can gain from the team process. A number of strategies can help this occur; for example, having individual accountability by asking members to identify individual contributions and or giving individual weightings to grades; asking the team to define member roles and responsibilities; and designing tasks that combine independence and interdependence. The reality is that students do break up tasks, complete components individually and then assemble the results so we think it best to recognize and work with this reality, which actually replicates what happens in industry. The aim is to avoid situations where critical outbursts undermine relations to the extent that students feel they have no alternative but to carry members who are not pulling their weight. Dealing with anomalies can form the basis for further discussion and allow the teams to monitor their progress. In addition, we have found that allowing team planning time in class allows the educator to support the group in confronting

and dealing with problems when the first emerge, which helps build students confidence in dealing with such situations..

Students in this study clearly saw the benefit of having clear and structured processes for managing the team process. The teams used the team development models to review their progress. The Tuckman and Gersick models were used to remind students to balance the task and develop team relationships and as educators, it was rewarding to see the students use the models and processes to manage their teams and value how this enhanced their ability to perform under pressure. Another important component is that the teams use their own experiences and knowledge to develop the team processes that suit them and can renegotiate these at any time, if that is what the team desires. We think this is critical! Students need to own the process for them to be inclined to follow it. however having For example if a student does not submit work on time, other members of the team are able to hold the member to their agreed commitment, which means individuals are accountable to the team.

Advice for Practitioners

Based on the findings of the study and feedback from the students, there are a number of strategies that we believe educators could put into practice to better manage the team learning experience. The first of these is to educate the students about team development and conflict, the second is to manage the team process and intervene early when problems occur and the third is to ensure that there is some accountability for individuals as well as the team. Firstly, educating the team members on team processes and what happens as a team develops, helps them view stumbling blocks as part of the process, rather than problem people.

Understanding that periods of conflict, generated by differences of opinions and expectations, coalitions and lobbying and even periods of inertia, are part of the process is empowering. This is similar to the problems students will encounter when they enter the workforce (Costello et al., 2002) and students recognize this. When students start to recognize these as stages of development they also recognize that changing the team membership is not the solution, as similar or worse problems can occur with other members. Students can use their own experiences of working in teams to build a profile of what has worked for them in the past and what difficulties they have encountered. This allows them to identify strategies that they can put in place to minimize the risk of problems. The second educational hurdle is to get students to understand and manage conflict. Viewing conflict as constructive, in that it encourages new ideas and ways of doing things, also supports problem-solving to improve relationships, innovation, member learning and satisfaction.

The second piece of advice is that a strategy to manage a team process needs to be in place and we believe this needs shared ownership by the educator and student. Asking students to develop processes or rules to manage their interactions gives them ownership; however, the educator needs to provide the tools in terms of skills and support as well as hold individuals accountable. By adopting a reflective approach, as described by Kuit and colleagues (2001), the educator models the reflective process for students. This shared responsibility provides support to the student while they learn how to manage the process and gives the educator an avenue to identify and address problems early, should they occur. It also recognizes that the students are not always capable or experienced enough to manage this alone. Strategies we

recommend include; teams need to develop their own operating rules, small team building exercises to build relationships, progress reviews, encouraging students to work with others with similar aspirations and aim to catch problems early. Manage accountability in several ways. Firstly, hold members accountable to the agreed rules. Allow team members expel a member who fails to live up to their commitment to the team [this is allowed after consultation with the educator and has not been implemented in the past two years]. Do not make teamwork mandatory, some students do have extenuating circumstances that compromise their ability to work in a team; forcing the issue undermines the learning of all involved. In the instance where an individual leaves or is excluded from a team they can take work with them that they have contributed to. Our experience suggests that following a strict program with teamwork yields a richer and more satisfying experience for students, with fewer problems. Students have indicated that dealing with problems when they do occur actually strengthens the relationship among members.

Limitations

This study is not without its limitations. The first of these is that the study contained relatively small samples. This is to some extent overcome by the fact that the study took place with two separate cohorts of students over two years and identified similar problems and outcomes. The second limitation some may identify is the differences in measures over time and the limitations this poses for psychometric analysis. However, our intent was to use an action research, rather than controlled approach, so we could respond to student needs over time. The third limitation is that the students were second-year management students and their responses may not be typical of students in other disciplines. Typically, management courses place a strong emphasis on experiential and problem based learning, so the students learn how to explore and identify different options that take into account a variety of contingency effects, rather than learn the correct answer. These students are used to dealing with ambiguity in their coursework and course content and this may differ in other disciplines. Although there is a considerable amount of cross-disciplinarity in programs across the University, the students would all have participated in preliminary management course that is a prerequisite to this particular course.

Originality/value of paper

This paper not only provides some valuable insights into the problems of dealing with teamwork in the university setting, it also provides some strategies to assist educators and students better manage the team process and achieve better learning outcomes. Essentially the paper deals with to divergent problems. The first is that it provides some guidance on how to tertiary institutions can meet the high expectations of industry, that graduates will be skilled at working within teams. Secondly, it provides some guidance and practical strategies for educators to help them better manage team processes and learning, to achieve better learning outcomes. Given the current environment where resources are limited and teaching loads are increasing, shared learning among team members is one way of maintaining high quality learning outcomes.

In summary, the results of the study over two years of undergraduate students shows that students do value teamwork and problems can be minimized, if not eradicated, by educating and empowering the students to help to manage the process of teamwork. Satisfaction with teamwork was higher in the second year of the study. This was

likely a result of having clearer structures to assist the students manage the process and allowing some time in class for the students to plan and organize their team activities. This partially supervised time significantly reduced student reliance on conflict resolution.

Overall, there were minimal differences between the genders, age teams and students with differing learning style preferences. The fact that some students preferred an individualistic approach did not significantly interfere with their ability to work in teams once they understood the benefits and rationale for this. We would caution others that putting too much responsibility on students to manage the process increases the risk of problems and is more likely to interfere with learning outcomes than improve these. The sheer logistics of coordinating team activities in short time-frames puts a lot of pressure on individual members and the team. In management, we teach students that a task can only be completed satisfactorily if the worker has the knowledge, skills and ability to complete the task and the resources, including time, to meet the target. Gersick's model identifies the importance of allowing time to build and maintain member relationships as well as complete the task. Problems can be overcome by providing class time for planning and organizing activities that allow some individual components and being mindful that increased team size and shortened periods add to the tasks complexity. On the one hand, it might be true to say that students learn what not to do from negative experiences; however, we believe they can learn far more from positive learning experiences. Teaching students to establish boundaries and agree on conflict resolution processes helps them better manage the team process and mimics the policies and procedures implemented in the work force, which after all, is one of the primary aims of teamwork in the educational setting.

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Q 7 – 22 These 16 items were drawn from Triandis collectivism attributes questionnaire. Individualist scores are at the lower range of 16 – 80,; whereas collectivists rate at the higher end of the 16- 80 range

Triandis H.C (1995) Individualism and Collectivism Boulder, Colorado, Westview Press,

Q 23 – 45 from the Learner Attitude Survey {Barnes J & Owens, L (1992). Learning preference scales: Handbook and test master set, teachers, students, parents. Hawthorn, Vic, The Australian council for Educational Research Ltd}.

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Figures and Tables

Table 1: Summary of data collected

| | | |
|--------|----------------------|------|
| | 2004 | 2005 |
| Time 1 | 196 | 114 |
| Time 2 | 164 (152 matched) | 99 |

Table 2:

Means and standard deviation for response patterns in 2004

| | | | | |
|--|-------|----------------|-------------------------|----|
| N =148 (196) | Mean | Std. Deviation | Reliability | |
| Cooperation | 3.79 | .48 | .69 | |
| Independence | 2.78 | .51 | .65 | |
| Individualism | 2.83 | .71 | .71 | |
| High Collectivism; | 4.06 | .53 | .68 | |
| NB: Measures above recorded on Likert Scale 1-5 | | | | |
| Competing | 9.7 | 1.95 | | |
| Collaborating | 11.6 | 1.8 | | |
| Avoiding | 8.3 | 2.4 | | |
| Accommodating | 10.6 | 1.5 | | |
| Compromising | 11.1 | 1.9 | <i>Cluster Grouping</i> | |
| Observing | 13.04 | 4.09 | 16 | 10 |
| Doing | 12.07 | 4.15 | 9 | 15 |
| Feeling | 10.73 | 3.66 | 11 | 10 |
| Thinking | 14.42 | 3.64 | 14 | 15 |

- NB:** 1. Learning Styles and Conflict-handling preferences were measured using forced choice Scales, with higher values indicating higher weightings.
 2. Cluster analysis shows normalized distribution.

Table 3: Peer feedback in relation to assessment and team performance

| Rank | N | Mean | SDev | t- test of diff | |
|----------|-----|-------|-------|-----------------|--------|
| 1 (Self) | 103 | 4.181 | 1.096 | Self | others |
| 2 | | 4.444 | .867 | .75 ns. | |
| 3 | | 4.126 | 1.064 | .28 | .001 |
| 4 | | 3.799 | 1.137 | .065 | .000 |
| 5 | 64 | 1.563 | 1.943 | .000 | .000 |

T-test significance p =.05 sig 1- 2

Note: smaller number at Rank 5 as fewer groups had five members

Table 4: Correlation analysis for matched data sample, 2004.

| | | | | | | | | | | |
|--|--------|-------|--------|-----------|---------|----------|-------------|-------------|----------|-----------|
| | Gender | Study | Access | Observing | Feeling | Thinking | Cooperation | Independent | Teamwork | Team Work |
|--|--------|-------|--------|-----------|---------|----------|-------------|-------------|----------|-----------|

| | | Full/P Time | WebCT | | | | | | Satisfaction | Processes |
|---------------|---------|----------------|--------|--|--|--|--|--|--------------|-----------|
| WebCT | -.177* | | | | | | | | | |
| Age | | .425** | | | | | | | | |
| Work | | .321** | | | | | | | | |
| Do | | | | | | | | | | |
| Think | | | | | | | | | | |
| Independence | | | | | | | | | | |
| Integrating | -.247** | | .320** | | | | | | | |
| Collectivism | .177* | | | | | | | | | |
| Teamwork | | | | | | | | | | |
| Satisfaction | | | | | | | | | | |
| Teamwork | | | | | | | | | | |
| Processes | | | | | | | | | | |
| Use I-Lecture | | | | | | | | | | .207* |

* Correlation is significant at the 0.05 level (1-tailed)

** Correlation is significant at the 0.01 level (2-tailed).

NB: Only significant correlations are presented for ease of interpretation

Table 5: Means, standard deviation and Correlation results for 2005

| Traits | Mean | Std Dev | Reliability | Correlation Matrix | | | |
|----------------------|------|---------|-------------|--------------------|---------------|---------------|-------------|
| | | | | Leadership | Communication | Interpersonal | Aspirations |
| Leadership | 3.54 | .66 | .75 | | | | |
| Communication | 3.83 | .47 | .65 | .560** | | | |
| Interpersonal skills | 3.86 | .57 | .65 | .361** | .588** | | |
| Aspirations | 3.62 | .55 | .68 | .454** | .306** | .177 | |
| Problem Solving | 3.65 | .54 | .73 | .583** | .460** | .291** | .469** |

** Correlation is significant at the 0.01 level (2-tailed). N = 114

Table 6: Comparison of student satisfaction with outcomes 2004/5

End of semester Feedback

| | 2004 | | 2005 | |
|--|-------------|------------|-------------|-----------|
| | Mean | Std. Dev. | Mean | Std. Dev. |
| How satisfied were you with | | | | |
| Experiences of teamwork in this course | 4.08 | .98 | 4.11 | .92 |
| Experiences of teamwork overall [in other courses] | 3.94 | .74 | 3.79 | .84 |
| The amount of time spent on team projects? | 3.72 | .82 | 3.89 | .86 |
| Your ability to co-ordinate times for teamwork? | 3.57 | 1.03 | 3.86 | .88 |
| The membership of your team? | 3.71 | .96 | 4.01 | 1.06 |
| Your learning in the team setting? | 3.96 | .95 | 3.85 | .97 |
| Did having clearly articulated rules aids you're teamwork? | 3.85 | .88 | 3.88 | 1.14 |
| Did your team use team rules to help manage your team? | 3.92 | 1.17 | 2.97 | 1.51 |
| Did your team use the conflict resolution procedure? | 3.08 | 1.40 | 2.46 | 1.44 |

NB: Significant changes are identified in Bold type.

Table 7: Comparison of satisfaction outcome correlations for 2004 and 2005.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|--|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

| | | | | | | | | | |
|--------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| 1. Teamwork Satisfaction | 1 | .362** | .101 | .404** | .446** | .725** | .554** | .198* | .024 |
| 2. Teamwork other courses | .216* | 1 | .470** | .361** | .253** | .336** | .354** | .274** | .125 |
| 3. Team Time | .454** | .323** | 1 | .308** | -.007 | .211* | .265* | -.032 | .104 |
| 4. Co-ordinate | .345** | .319** | .412** | 1 | .464** | .487** | .468** | .124 | .050 |
| 5. Team members | .611** | .243* | .405** | .513** | 1 | .443** | .382** | .128 | .080 |
| 6. Learning | .666** | .261** | .372** | .463** | .613** | 1 | .595** | .241** | .000 |
| 7. Benefit of Having Rules | .197 | .177 | .206* | .217* | .204* | .362** | 1 | .254** | .130 |
| 8. Used Teamwork Rules | .229* | .157 | .258** | .258** | .318** | .435** | .623** | 1 | .517** |
| 9. Used Conflict Resolution | .185 | .270** | .092 | .238* | .148 | .241* | .455** | .597** | 1 |
| Use of I-lecture - 2005 | -0.63 | -0.66 | -0.07 | -.137 | -.071 | -.030 | .252* | .262** | .286** |

NB: 1. Correlation significant at 0.05 level (2-tailed) ; ** Correlation significant at 0.01 level (2-tailed).
2. 2004 Data in the Upper Right Quadrant ; 2005 Data in the Lower left quadrant

From:

Q 7 – 22 These 16 items were drawn from Triandis collectivism attributes questionnaire. Individualist scores are at the lower range of 16 – 80; whereas collectivists rate at the higher end of the 16- 80 range

Triandis H.C (1995) Individualism and Collectivism Boulder, Colorado, Westview Press,

Q 23 – 45 from the Learner Attitude Survey {Barnes J & Owens, L (1992). Learning preference scales: Handbook and test master set, teachers, students, parents. Hawthorn, Vic, The Australian council for Educational Research Ltd}.

Extra:

Humphreys and his colleagues [1997] conducted a qualitative study into collaborative learning, that involved a small element of peer assessment. Their findings were positive and support that students learn from each other; however they found that a critical element achieving a positive outcome was building an environment for maintaining an environment to encourage "trust and camaraderie" in a positive self-directed learning environment. One item of note about the study is that students had support for collaboration with an online learning discussion forum , which would help overcome the statistical difficulty that is a particular difficulty for students who were either for or part-time.

| | 2004 | 2005 | |
|---|--|------|-------|
| Are you likely to listen to I-Lecture transcripts for exam revision? | + ve 60% | 3.77 | 1.398 |
| How often did you listen to the I-lecture transcripts that are available on-line for this course? | 13% often, 33% occasional 54% not at all | 2.29 | 1.264 |
| Did you listen to I-lecture as a substitute for attending lectures? | 16 % (of those 3 students relied on I-lecture weekly | 2.26 | 1.306 |
| Did you listen to I-lecture in addition to attending lectures? | 8% indicated the also attended the lecture and listened to it. | 1.80 | 1.078 |
| If you work, how many hours do you work weekly: less than 10, 10-20 more than 20 | | 2.17 | .734 |
| | | 1.11 | .347 |

Time 1, n = 164; Time 2, n= 99

Group Teamwork

Peer feedback in relation to self assessment and team performance

| | N | Mean | SDev | t- test of diff | |
|------|-----|------|------|-----------------|--------|
| Self | 103 | 4.18 | 1.09 | Self | others |
| 2 | | 4.44 | .87 | .75 ns. | |
| 3 | | 4.13 | 1.06 | .28 | .001 |
| 4 | | 3.8 | 1.14 | .065 | .000 |
| 5 | 64 | 1.56 | 1.94 | .000 | .000 |

T-test significance p =.05 sig

Reliabilities

Triandis.

VI vertical individualism = the five items - standardized reliability .71 -

Hi Coll [high collectivism] -5 items, standardized reliability .68

Barnes & Owens

cooperation -- eight items – reliability .69

independence - eight items .65

Team co-operations & Individualism & collectivism

N=192

| N =148 | Mean | Std. Deviation | Reliability |
|--------------------|------|----------------|-------------|
| Cooperation | 3.79 | .48 | .69 |
| Independence | 2.78 | .51 | .65 |
| Individualism | 2.83 | .71 | .71 |
| High Collectivism; | 4.06 | .53 | .68 |

Collectivism/individualism – Triandis [1995]

Cooperation / independence – Owens & Barnes [1992]

Conflict handling

| N =148 | Mean | Std. Deviation |
|---------------|------|----------------|
| COMPETING | 9.7 | 1.95 |
| COLLABORATING | 11.6 | 1.8 |
| AVOIDING | 8.3 | 2.4 |
| ACCOMMODATING | 10.6 | 1.5 |
| COMPROMISING | 11.1 | 1.9 |

No sig diff., Ist wave and matched sample

Only significant difference - Males more competitive than females

| | | |
|----------------|--------------|-------------|
| Males | 10.17 | 2.14 |
| Females | 9.41 | 1.71 |

p <.05

Learning styles

| | | | | |
|-----------|-------|------|-------------------------|-----------|
| N = 158 | Mean | S/D | <i>Cluster Teamings</i> | |
| OBSERVING | 13.04 | 4.09 | 23 | 3 |
| DOING | 12.07 | 4.15 | 2 | 22 |
| FEELING | 10.73 | 3.66 | 21 | 5 |
| THINKING | 14.42 | 3.64 | 3 | 20 |

Females significantly more likely to be Feeling @ $p < .05$

| | Initial Cluster Centers | | <i>Final - Normalised</i> | |
|-----------|--------------------------------|-----------|---------------------------|-----------|
| | 1 | 2 | 1 | 2 |
| OBSERVING | 23 | 3 | 16 | 10 |
| DOING | 2 | 22 | 9 | 15 |
| FEELING | 21 | 5 | 11 | 10 |
| THINKING | 3 | 20 | 14 | 15 |

Satisfaction with teamwork

n- 164

| | \ | St Dev | -ve | Neut | +ve |
|--|------|--------|-----|------|-----------|
| In this course | 3.88 | 1.16 | 14 | 7 | 79 |
| other courses | 3.62 | 1.25 | 17 | 9 | 74 |
| overall | | | | | |
| In this course | 2.12 | 1.93 | 24 | 16 | 60 |
| Amount of time spent on team projects. | | | | | |
| Ability to co-ordinate times for teamwork. | 3.48 | 1.08 | 21 | 14 | 65 |
| Team membership | 3.57 | 1.18 | 14 | 8 | 78 |
| Your learning in the team setting | 3.93 | 1.08 | 12 | 15 | 73 |
| | 3.81 | .98 | 13 | 14 | 73 |
| Do you think having clearly articulated rules aids you're teamwork? | 3.73 | 1.25 | 19 | 11 | 70 |
| Did your team use the team rules to help manage your team? | 2.9 | 1.46 | 34 | 27 | 38 |
| Did your team use the conflict resolution procedure? | 2.4 | 1.45 | 47 | 30 | 23 |
| Are you likely to listen to I-Lecture transcripts for exam revision? | | | 37 | 3 | 60 |

| |
|---|
| How often did you listen to the I-lecture transcripts that are available on-line for this course? 53% did not; 19% listened once or twice, 14% several times , 9% listened most weeks 4% listened each week |
| Did you listen to I-lecture as a substitute for attending lectures?; (64% - no; 13% occasional) 78 % no or very occasional, 10% - occasional, 12% mainly 4.5% each week (8) |
| Did you listen to I-lecture in addition to attending lectures? 84% no – very little; (9% occasional) 5 % mostly & each week (2%) (3students) |

independent sample t-tests 2005

| | F | Sig. | T | df | Sig. (2-tailed) | Mean Difference |
|---------|-------|------|-------|----|-----------------|-----------------|
| Leads | 3.570 | .062 | 3.642 | 90 | .000 | .47461 |
| Comm | .746 | .390 | 1.479 | 92 | .142 | .14274 |
| InterP | .003 | .957 | 2.054 | 92 | .043 | .23652 |
| Aspir | .183 | .670 | -.496 | 92 | .621 | -.05401 |
| ProbS | 1.656 | .201 | 3.198 | 92 | .002 | .31784 |
| Meaning | .256 | .614 | -.693 | 92 | .490 | -.08859 |
| Indep | 3.589 | .061 | 3.071 | 92 | .003 | .39862 |

Peer feedback in relation to assessment an team performance

| | N | Mean | SDev | t- test of diff | |
|------|----------|-------------|-------------|------------------------|--------|
| Self | 103 | 4.181 | 1.096 | Self | others |
| 2 | | 4.444 | .867 | .75 ns. | |
| 3 | | 4.126 | 1.064 | .28 | .001 |
| 4 | | 3.799 | 1.137 | .065 | .000 |
| 5 | 64 | 1.563 | 1.943 | .000 | .000 |

T-test significance p =.05 sig 1- 2