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An Innovative Use of the Web to Build Graduate Team Skills

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ABSTRACT

Successful graduates in today's competitive business environments must possess sound interpersonal skills and the ability to work effectively in team situations within, and across, disciplines. However, developing these skills within higher education curriculum is fraught with organisational and pedagogical difficulties, with many teachers not having the skills, time or resources to facilitate productive group processes. Furthermore, many students find their teamwork experiences frustrating, demanding, conflict ridden and unproductive. This paper brings together the perspectives and experiences of an engineer and a social scientist in a cross-disciplinary examination of the characteristics of effective teamwork skills and processes. A focus is the development and operation of "TeamWorker", an innovative on-line system that helps students and staff manage their team activities and assessment.

TeamWorker was created to enhance team teaching and learning processes and outcomes including team creation, administration, development and evaluation. Importantly, TeamWorker can facilitate the early identification of problematic group dynamics thereby enabling early intervention.

Keywords

Group work, team projects, TeamWorker, team management online, team assessment, student conflict.

Introduction

Many of our waking hours are spent experiencing, interacting, living and working in groups such as our family, friends, associates, neighbours and colleagues. These group and team contexts may be social, sporting, professional, spiritual, political etc and demonstrate that despite our individualistic Western society, we remain essentially reliant upon the social interactions that groups provide. Moreover, government and industry increasingly recognise that successful social and commercial enterprises rely on staff that are able to effectively communicate, collaborate and operate within a range of groups to meet organisational strategic and business goals (Australian Education Council, 1992). However, university and other educators have only recently begun to actively emphasise and embrace the role and task of teaching all students how to effectively employ interpersonal and team skills in professional situations.

For example, in 2001 the Queensland University of Technology (QUT), Brisbane Australia, undertook a study of student viewpoints concerning their university group project experiences and found that most reported negative experiences and suggested changes to the ways in which team learning experiences and assessments were conducted (Hart, Stone, Daniel & King, 2001). Subsequently, the first author of this paper was awarded a QUT Teaching Fellowship to redress the identified issues through the creation of an on-line teaching aid. This paper describes and examines the basis, development and implementation of QUT's innovative "TeamWorker" system, which is a web-based, interactive software

application which enables effective training, administration and oversight of student project teams including student peer assessment and assistance to facilitate productive team processes and dynamics.

Universities and industry need

Whilst Australian universities have always had a key role in training people for professional practice, their approach to this has fundamentally changed over the past decade from a traditional idealistic “community of scholars” (Coaldrake & Stedman, 1998, p. 29) to one focussed on responding to business’ and community’ needs for a skilled, effective and innovative workforce to drive an internationally competitive economy. National education policies have increasingly emphasised economic factors such as economies of scale, cost effectiveness, flexibility, market responsiveness and the importance of graduates being “employment ready” with skills and knowledge that industry requires (James, 2000; Fox, Lonne & McDonald, 2001). In addition, there has been a general move within government, industry and the professions toward collaborative practice, with an emphasis on inter-agency and cross-disciplinary linkages, sharing of resources, and re-examining issues from multiple perspectives in order to address increasingly complex and rapidly changing social and economic issues (for example see Sommerlad, Duke & McDonald, 1998). In light of these trends and issues, the Australian Government’s Department of Training, Employment and Youth Affairs (DETYA, 2000) surveyed employers and found that problems with team activities were endemic across universities and that a lack of interpersonal skills is one of the three most common skill deficits in graduates.

However, significant changes have occurred within Australian universities that have arguably made teaching and facilitating team skill development much harder. Fiscal constraint

from successive Federal Governments has led to significant organisational restructuring and rationalising, moves to diversify and commercialise the income stream, increased numbers of international and fee paying students, regular review and development of curriculum to increase vocational application, large increases in class sizes and greater use of casual and part-time academic staff (Coaldrake & Stedman, 1998; James, 2000; Cain & Hewitt, 2004). Hence, at the same time as resources were being limited, workloads and expectations were being increased, and academic staff were being pressured to rapidly change work practices and approaches to teaching and learning. It is not surprising that many Australian academic staff experience high work stress (Winefield, 2003).

Within these broader social, economic and organisational contexts, universities have become increasingly concerned with the employment readiness of their graduates' generic skills and attributes. For example, QUT has embraced a number of knowledge, problem solving skills, ethical/attitudinal and social/relational skills, which students across all academic courses are expected to develop during their degree programs. These skills include the ability to fill the role of a cooperative, productive team member or leader; accept responsibilities and obligations; assert individual rights and respect the rights of others; adapt to unfamiliar cultures and operate in a socially and culturally diverse environment; and appreciate differences in gender, culture and customs.

Group dynamics and team practice

There is a wealth of research and literature concerning group dynamics and team practice. Essentially, groups are sets of people who are identified and defined with each other, share beliefs, values and norms, and who have frequent interactions to work on common tasks for agreed purposes (Benson, 2001). Groups may differ with respect to their size, purpose,

membership, goals, duration, and expectations of behaviour and outcomes. On the other hand, teams have been defined as a group of people independent of each other regarding their information, skills and resources, and who desire to collaborate and become interdependent with each other to reach common goals (Thompson, 2000). Teams allow members to manage their own affairs, are bounded and stable over time, and operate within a social context (Thompson, 2000). Hence, teams are a type of group in which general group principles and dynamics operate.

Despite the huge quantity of literature on teamwork, little of this knowledge has found its way into most university classrooms. Generally speaking, Australian university academics, who are not required to possess specific teaching qualifications, have had little, if any, formal training in group dynamics and team practice. For the most part they rely on what they might have learned from their own on-the-job experiences. It should not be surprising that this lack of expertise with group dynamics translates through to poor student assessments of their team situations.

It is beyond the scope of a paper of this length to fully explore group dynamics, but there are key characteristics of, and concepts associated with, group and team practice (see Benjamin, Bessant & Watts, 1997; Doel & Sawdon, 1999; Johnson & Johnson, 2003). Essentially, teams must identify and accomplish the practical steps or tasks taken to achieve the necessary outcomes; team members need to undertake critical reflection on tasks and process; construct formal and informal roles; be aware of developmental phases of group development; and have clear leadership and co-facilitation of the team's activities. Team members need to effectively communicate to build trust; to plan and review goals; manage issues of power and influence to support and include rather than disadvantage and subjugate; and deal productively with controversy, creativity and conflict by constructively using diversity to enhance achievement of outcomes.

In essence, effective team practice for student groups entails team members forming trusting bonds with each other and agreeing to unambiguous goals and standards, and clear expectations regarding the processes they will use to achieve these. This must occur in what is a competitive educational and social environment where students are awarded individual marks and grades, notwithstanding that they are mutually dependent (at least to some degree) with regard to achieving the team outcomes. They need to utilise regular and effective communication skills in order to plan, monitor and review task completion and group processes. In such a setting, group diversity can become a critical catalyst for high performance as it enables creative ideas and solutions to arise and be developed. However, group conflict, whilst a natural part of these developmental processes, needs to be recognised and effectively managed so as not to destroy group relations and trust (Paulus *et al.* 2005). Facilitative and inclusive leadership from students and teachers can help to avoid misuse of power and the debilitating effects of particular members dominating others (Paulus *et al.* 2005).

Hence, team practice can be seen to involve higher order interpersonal and group skills. Not all university students possess these and some may require the assistance of academic staff in order to develop to their potential.

At the undergraduate level, effective teams can help students to develop their interpersonal and group skills and prevent them becoming disillusioned and resentful of team related projects. Buckenmyer (2000) sounded an important warning to universities by saying that these sorts of negative experiences can sour students' attitudes toward all team participation, which may affect their performance in later work teams.

The literature identifies specific attributes of effective team functioning that teachers need to promote, teach and monitor amongst their student teams (see Young & Henquinet,

2000; McGourtey & DeMeuse, 2001; IIML, 2003; Isaacs, 2003). Within a tertiary education context, effective student teams exist when their members:

- a) receive clear instruction on effective team function and have access to related resources;
- b) have clear goals and ground rules;
- c) have regular, structured meetings;
- d) maintain good, accessible records of the deliberations of those meetings;
- e) undertake and receive feedback on repeated peer evaluations of their team, which may include anonymous reports;
- f) are assessed on their team function as well as on the team's output;
- g) have fair processes for dealing with non-performing members, documented by the team;
- h) have prompt feedback on the success or otherwise of their team's performance; and
- i) become aware of, and reflect on, their own abilities and performance.

Of particular importance is the need for open, fair and accountable assessment of individual and group processes and outcomes, and effective management of interpersonal and group conflict. These issues can generate considerable heat and tension and, if responded to poorly, can lead to the student group self-destructing or a range of other unproductive outcomes including poor academic results (Paulus *et al.* 2005). Thus, students have a lot "riding on" their teacher's sensitive facilitation of effective team processes. Remedial intervention by teachers into student groups, if it is timely, proportionate and appropriate in its use of power and authority, can be instrumental in getting issues raised and addressed. On the other hand, it may also be counterproductive if the involvement is seen as unnecessary and

intrusive by group members or entails the teacher riding “rough shod” over team members’ rights and responsibilities.

From the authors’ experience, university teachers commonly provide little training in team skills for their students, nor ensure a structure for the ongoing development of those teams. Teachers usually do not closely monitor the progress of those teams and, when team problems inevitably occur, they are often unwilling to intervene in, or even identify, teams that are approaching, or have arrived at, a dysfunctional state. The reasons for this reluctance to be involved in the micro aspects of team development are manifold, but usually include:

- an unwillingness to commit the significant time required to construct and run training sessions and to prepare resources students will need;
- a lack of knowledge about what sort of training and resources would be needed;
- an unwillingness to commit the significant time required to monitor teams and so identify whether they are functioning properly;
- uncertainty in identifying dysfunctional teams; and
- a feeling of inadequacy in knowing how to deal with the frequently explosive emotions that can be generated in seriously dysfunctional teams.

Despite university policy exhorting teachers to provide meaningful and positive experiences which will develop students’ team skills, the increasing financial strictures within universities mean that fewer resources are provided for teachers to develop their own capabilities in this area, let alone their students’. Furthermore, the high demands of administration, research, and community service obligations place significant limitations on academics’ capacity to develop their skills. These broader issues impact heavily on any attempt a teacher might make to manage their students’ team projects and meet their developmental needs.

It's no wonder, then, that students reported that although they had the opportunity to practise group work, few felt there was sufficient preparation for the experience (Hart *et al.* 2001). Students felt that group work assessment was unfair because frequently only the outcome was assessed and not students' success in developing teamwork skills. Students also complained that there were rarely any consequences for the "loafer" – the one who does not contribute effectively to the group process and outcomes. Students' widespread dissatisfaction was illustrated by quotes such as: "*..it is just 'form a group and go and do the work', there is no structure or mention of how to do it*"; "*Group work is so unfair*"; and "*I hate group work*".

Hart *et al.* also commented:

While they [the students] are given criteria for success they are not given techniques to overcome difficulties. In particular they feel that they are not well equipped to handle conflict within the group and deal with group members who were not contributing appropriately. (Hart *et al.*, 2001, p. 4)

Clearly, there is a need for effective means to address these grievances over poor management of student team based activities, but which does not require large inputs of time and energy from the teacher. The variable, and often poor, skills of teachers in preparing students for team activities needs to be addressed, along with processes to help them through the minefields of conflict and limited interpersonal capabilities.

The QUT project

At QUT the problems identified above have been addressed by development and implementation of progressively more comprehensive on-line facilities, funded by various

QUT grants over a 4-year period, and culminating in the TeamWorker on-line team management tool, an innovative and sophisticated software application.

The first attempt to manage teams online at QUT used email to promote close communication between students and teacher, but as Digenti (2003, p. 4) wrote, “Email is not an effective team history, sequence, or tasking tool.” It is also particularly poor for managing processes that occur in stages or in multiple versions over long time periods. Later, a detailed on-line reflection tool, QUT’s Student Capability Profile (SCP), became available and was used by students to log confidential fortnightly deliberations on the progress or predicaments of themselves and their team. These reflections provided teachers with a window into their students’ teams and were helpful in identifying the early stages of unresolved conflict in a team. Nevertheless, the SCP was not developed as a team management tool and so had its drawbacks, as will any system not designed around the students’ needs. These drawbacks included:

- a clumsy and inefficient paper-based approach to construction and administration of teams;
- an inability to expose students to the wealth of information on effective team operation;
- the need to read and assess hundreds of students’ fortnightly reflections presented unsustainable demands on teacher time; and
- the lack of any mechanisms, except by paper, for students to provide feedback to each other, nor to systematically document their team’s meetings, progress, task allocation, and team decisions.

An on-line system was needed - one which enabled teacher and students to address all the characteristics of effective teamwork and to overcome the identified deficiencies.

However, only two computer-based systems could be found that addressed teamwork issues:

“Team Developer” by McGourtey & DeMeuse (2001), and “SPARK” (self and peer assessment resource kit) by Freeman & McKenzie (2002). Both of these systems provide peer feedback facilities but little else. No tool could be found that would permit the teacher to create a structured, closely monitored team work experience in which students could engage with and experience the critical characteristics of effective team practice.

The development of team work on-line

It became clear that teachers needed a flexible, easy to use kit or tool with straightforward implementation into a teaching program, and that could be adapted to that program and its team activities. Using the literature and drawing on the needs espoused by fellow teachers and students, it was clear that the tool would require five basic capabilities:

1. It would need to be web based, because team meetings and other related student and teacher activities can occur anywhere and at anytime. Students and teachers could be provided with efficient 24/7 access to all related records and information held within a central database via a web browser.
2. Students must be able to easily communicate with each other.
3. Students must be able to easily record information about themselves, their plans, their team’s progress, their reflections on and evaluations of themselves and of their fellow team members. These records must be readily accessible to members of the team to promote effective team operation and to the teacher for oversight and assessment where appropriate.
4. Teachers must be able to create activities on-line for students to undertake either as a team or individually. In this manner the teacher would be able to form a series of activities that led the students through a path of structured

learning about the various stages of team formation and growth. The teacher should be able to specify the type, number and frequency of those activities as they see fit.

5. The teacher must be able to communicate readily with team members, create teams, administer those teams and their composition, view a variety of reports on team progress, and assess that progress (ie allocate grades or marks) if they choose.

As part of a 12-month teaching fellowship in 2003, an on-line web-based system known as TeamWorker was created at QUT (see figure 1). TeamWorker has all of the capabilities identified above, together with innovative support facilities and ready access to resources for training students and advising them about how successful teams work.

(locate Fig.1 here)

TeamWorker is a team management and learning tool. It does not take the place of the teacher but, rather, supports the teacher and students in existing team projects in a way that helps to maximise students' awareness of how effective teams perform and to minimise the consequences of conflict becoming unhealthy. The teacher has a variety of options for facilitating the team's completion of an assessable project.

There are many ways in which TeamWorker can be set up by a teacher, but one useful approach could be as follows. The teacher initially conceives of a project or assignment which they want students to undertake in close collaboration with other students in a team format. Through TeamWorker the teacher then creates an appropriate number of teams to which the teacher might allocate students or, alternatively, to which students might eventually allocate themselves, thereby enhancing choice. The teacher recognises that working to a plan is

important and so chooses from TeamWorker's list of activities one that requires the students to submit to TeamWorker their team's goals and plan of execution of the project early in the semester. The teacher also realises that regular reporting and recording of team progress is critical and then chooses from TeamWorker's activity list one that requires students to submit minutes of a fortnightly team meeting via TeamWorker. Finally, the teacher appreciates the need for students to get individual feedback on their contribution to the team and so chooses another of TeamWorker's activities that requires students to undertake a semi-confidential peer assessment of their fellow team members on-line, and specifies two points in the semester when this must occur.

Benefits to students

A major reason teachers might require their students to undertake team projects and assignments is so that students can develop over the life of the project an appreciation as to how teams should function and how they can contribute to them. The whole process can therefore be seen as a positive learning exercise for the students, with significant and tangible benefits for them. TeamWorker's benefits to students include:

- Students must first register with TeamWorker via the 'Student Entry' tab (see figure 1), which requires them to record, amongst other things, their contact phone number. Other members of the team can view this number and each other's email addresses anytime on-line, thereby enabling easy accessibility. Students can also set up an email to their whole team or to the teacher with only 2 clicks of their mouse thereby preventing many communication problems arising.
- The registration process also takes students through a mandatory self-evaluation exercise to alert them to their own skills and deficits in teamwork. Students will be

more successful if they are aware of the personal “baggage” they bring to team gatherings. Furthermore, only students who choose to be active in the course actually register with TeamWorker; those who withdraw from the course early tend not to register. Teams are constructed only out of registered students, which avoids “no show” students being allocated to teams and causing the team angst when they do not turn up to the first, or subsequent, team meetings.

- There is a structured set of advice and guidance to students via the ‘Success’ tab on how successful teams work and, more importantly, a step-by-step process on how to deal with loafers who do not contribute equitably to the team. The latter process mimics sound workplace practices in that it specifies the need for adequate records, provision of feedback by the team to the loafer, and when to pass the problem to one’s supervisor (or teacher in this case). TeamWorker specifically addresses one of the most persistent and emotionally charged student complaints by providing a process for dealing with loafers.
- The most common and easily reviewed records of progress are minutes of team meetings, accessible via the ‘Assess’ tab. The teacher can require students to submit their minutes via TeamWorker as often as the teacher desires. This activity asks students to record member attendance, past and future tasks allocated to each member, whether tasks were completed, current and future meeting details, and key decisions taken by the team. A specialised form of this activity asks students to submit their team’s agreed goals and plan of action for the project or assignment. All the minutes of a team, including its planned meetings are very easily viewed by a team member, obviating one of the common and – to fellow team members - annoying reasons given for a member not attending a meeting, namely “I didn’t know when/where the meeting was”.

- Self and peer evaluation of performance in, and contribution to, one's team is essential for growth in interpersonal skills to occur. TeamWorker has a number of ways in which personal reflection and peer feedback takes place via the 'Assess' tab. First of all, teachers can specify a peer evaluation activity in TeamWorker, in which each student chooses from an options list the extent to which they and each member of their team has contributed to the team (eg "little" or "a lot"). The mean of the evaluations of a given student by fellow members is able to be viewed by that student, but the student cannot see the individual evaluation by any other member. Second, the teacher can set up an activity that requires students to submit a paragraph or two to TeamWorker about their fellow team members' contributions. Each member can see what the other members of the team wrote in their review, but can't identify the author of a specific review. Finally the teacher can set up a confidential activity which requires students to submit a detailed reflection of their own involvement in the team. Only the teacher can view this reflection, so it gives students the chance to be completely candid in their thoughts about themselves and their team's success or failure.
- Working in teams provides good opportunities for students to practise their interpersonal skills, but it also provides a serious challenge to students practising those skills when significant discord arises. While experientially learning how to manoeuvre their way through the minefields of conflict is invaluable, there is a risk that significant damage can be done to relationships before the lesson is learned. TeamWorker helps minimise this risk by providing a safe simulation exercise online that takes students through various scenarios of problematic meetings. Because the students work through this exercise individually and privately, it allows them to evaluate options about how best to deal with the meeting problem, without harming

anyone. They can practise the exercise as many times as they wish until they find the best path through the problem.

- Finally, all the team project activities which the teacher has set up for students to do can be listed on the screen via the 'Deadlines' tab in chronological order with one click of the mouse. The students can see at a glance what activity is due presently, which activities they have completed and which are scheduled for future attention. They can therefore structure their workload and plan their team activities in an efficient way which firmly guides them to think about and practise effective teamwork skills. They can even choose to create their own additional activities such as recording minutes of special extra meetings, initiating their own peer evaluations, and so on.

A detailed analysis and evaluation of student' responses following TeamWorker's implementation is beyond this paper's scope. However, detailed feedback surveys showed that students welcomed the structured approach to teamwork, which they did not experience elsewhere; they understood quickly the need for them to take a planned and ordered approach to the operation of their teams and were generally very happy to be able to access the list of deadlines for the activities. Broadly, one-third of student teams using TeamWorker reported quiet members, one-third reported ineffective meetings, and a quarter of teams reported having to deal with loafers. TeamWorker did not prevent these problems but gave these teams a strongly supported mechanism for handling them, and students greatly appreciated it. They found the online basis for recording and accessing team information to be helpful and appropriate. Based on student feedback, TeamWorker has been improved and a formal evaluation study is planned.

Benefits to teachers

TeamWorker allows the teacher to do the following via the ‘Staff Entry’ tab (see figure 1): inspect any and all entries which students have made into TeamWorker; allocate students to teams in a variety of ways depending on the circumstances; administer those students and teams; set up activities students must perform; set up an email to any student, a whole team or the whole class with only a few clicks of the mouse; generate a wide variety of status reports on all the students and teams; and receive at weekly intervals automatically generated emails showing exceptions (i.e. of those teams or students that are not performing to an appropriate standard).

Once the teacher has set up the schedule of required team and individual activities in their course, TeamWorker then does all the record keeping and administering of tasks and deadlines automatically. The teacher can select activities for students to do from the wide range of activities in TeamWorker, and can require those activities to be done by the students as often as the teacher feels is appropriate for the team project, with due consideration to students’ workloads. TeamWorker can therefore be easily installed in, and tailored to, the individual needs of a course or a team project.

TeamWorker allows the teacher to choose to be involved in the process to the extent that they wish although, generally speaking, an appropriate degree of involvement which is best for students who are learning how to work in teams, is when the teacher:

- uses TeamWorker’s wealth of information on team training (via the Staff Help facility) to construct at least one hour duration training sessions each week for their students;
- conducts regular inspections of students’ records such as meeting plans, minutes, evaluations and reflections, marks, etc (see figure 2);

- uses TeamWorker’s records to identify potentially dysfunctional teams or individuals as they develop, and intervenes appropriately and sensitively to help the team rectify the impending problem(s).

(locate Fig.2 here)

The weekly automatic email provides a useful summary of the status of the teams, of the students, and of the required activities in the team project by providing tables in the email showing:

- the number of students currently enrolled in the course and/or who has registered with TeamWorker;
- the activities due to be completed prior to the date of the report;
- the number of meetings that each team had recorded in TeamWorker; and
- the number of meetings that each student had attended, the number of tasks allocated by the team to that student which they had completed, and how many other of the required activities they had completed to date; eg. peer evaluations, simulations, reflections, etc.

Week by week, therefore, it is very easy for the teacher to see which teams and students are progressing as required, which teams are beginning to experience difficulties, and which students are demonstrating an unacceptable level of commitment to the team, that is, “loafing”.

In the authors’ experience of running numerous undergraduate team activities over many years it is apparent that initially there is a high level of tolerance by many students to loafers in their teams. However, anger and frustration in those teams build steadily as the weeks pass and can quickly boil to the surface when the workload on the contributing students escalates as a completion deadline looms. By then, unfortunately, it may be too late

to rectify the matter. In TeamWorker, its team-email facility enables the teacher to easily notify all members in any identified dysfunctional teams and suggest appropriate actions they could take to remove the incipient problems. The teacher can follow up such emails with brief meetings with those teams should the problems continue to show up in the teams' records.

Teachers responded very positively to the initial implementations of TeamWorker and reported it as helpful and useful to themselves and students. Typical comments from them included: "I found TeamWorker a great help during the semester"; "it's a good tool"; "it reduced my workload"; "it gave students more control over team operation and helped them see problems more easily"; "it's great, adds a different dimension to team work"; "the online reflection facility is not available elsewhere as easily". Teachers generally tended to adopt the tool to try and promote cooperation amongst students in teams and equity of workload amongst team members, as well as trying to get each student to take responsibility for the work of the team.

Without easy access to the sorts of comprehensive facilities provided by TeamWorker, it is hard to see how identification of team problems, proactive and constructive intervention, and rectification of problems by the teacher can be achieved without a large and unsustainable workload. The staff and students' responses to use of TeamWorker were very positive, not the least because they see that there is a clear and documented process by which the teacher can help students work through the inevitable interpersonal problems in their team. Whilst a formal evaluation is planned, the initial feedback and indications of success are very positive steps toward meeting students', staff and other stakeholders' needs.

Conclusion

It is apparent that whilst there is considerable social and economic value in developing university students' skills in team practice, significant difficulties arise when operationalising

this sort of training. For example, staff may not have the skills, time, resources or commitment to become involved in student teams that, should they become dysfunctional, may generate considerable heat and conflict and become extremely time consuming. Hence, it is imperative to properly equip staff to enable them to operate sound team learning environments and assessments, and to enable students to develop the sorts of skills that are required by contemporary professionals in the competitive work and economic environments. In view of the broader societal and sector changes and expectations outlined earlier, these issues will not disappear and thus, require innovative solutions.

This paper described a process of progressively implementing more comprehensive on-line facilities into team projects in engineering undergraduate units at QUT, but is also able to be applied to student assessments in other professional courses. The final step in that process was the creation of the TeamWorker web-based system, which allows detailed management of teams by the teacher without the large staff workload usually accompanying such a task. TeamWorker allows the teacher to easily: create and administer student teams; specify a variety of regular tasks for students including detailed meeting records, peer evaluations, reflections and team process simulations; inspect all information students enter into the system; and receive regular email summary reports of the progress of all teams and students. The system makes available to the teacher all the tools needed for creating, administering, communicating with and overseeing teams in their units.

Furthermore, TeamWorker facilitates the development of key team work skills for students, including goal setting, planning and monitoring process and task achievement, providing feedback, effective communication, the productive management of conflict, and personal reflection regarding their own approaches and performance. Students have specific and well-identified desires for having positive team experiences, including having a structured approach to team work, assessment of team function as well as team output, and a teacher-

supported clearly identified process for dealing with loafers. TeamWorker enables all these to occur.

This web-based innovation has proved itself to be efficient with regard to staff time and resources, and to be effective in meeting student needs, developing their team skills, and identifying those students and teams who require more intensive assistance. TeamWorker is relevant and useful for a wide range of university courses and team assessments that require students to apply and develop their ability to work collaboratively, cooperatively and productively with their peers. Such achievements also meet the broader aims and objectives of industry and government concerning required graduate skills. A wider implementation of this innovative web-based application is therefore timely and warranted.

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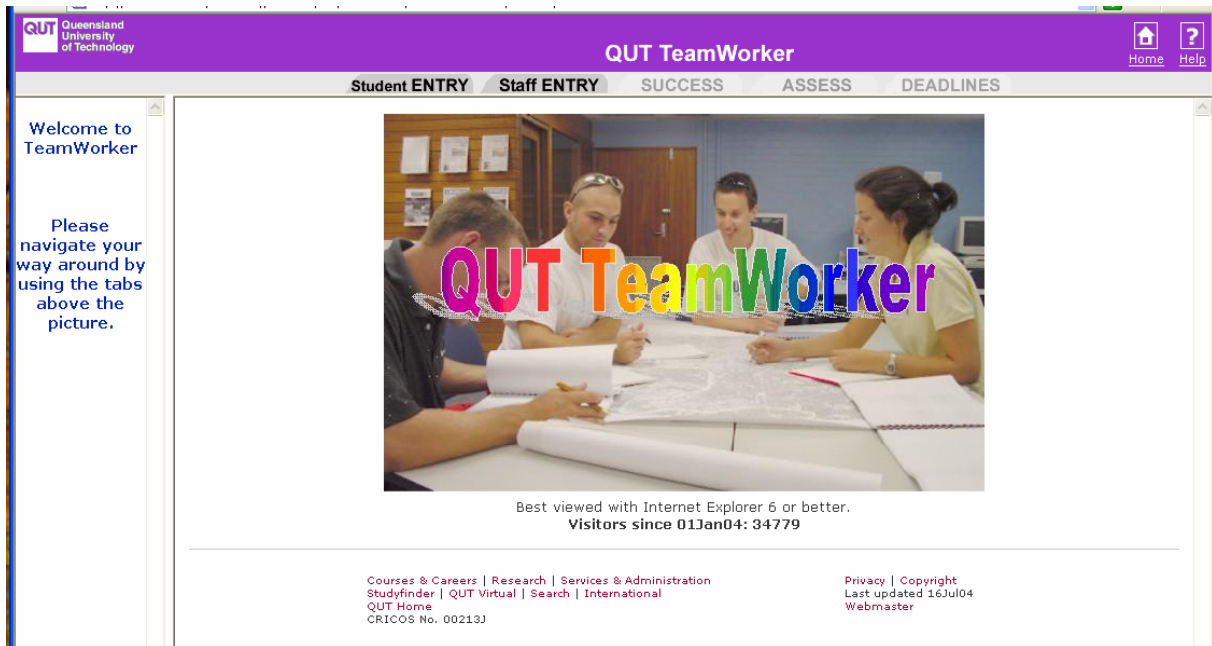


Figure1. Entry Screen in TeamWorker

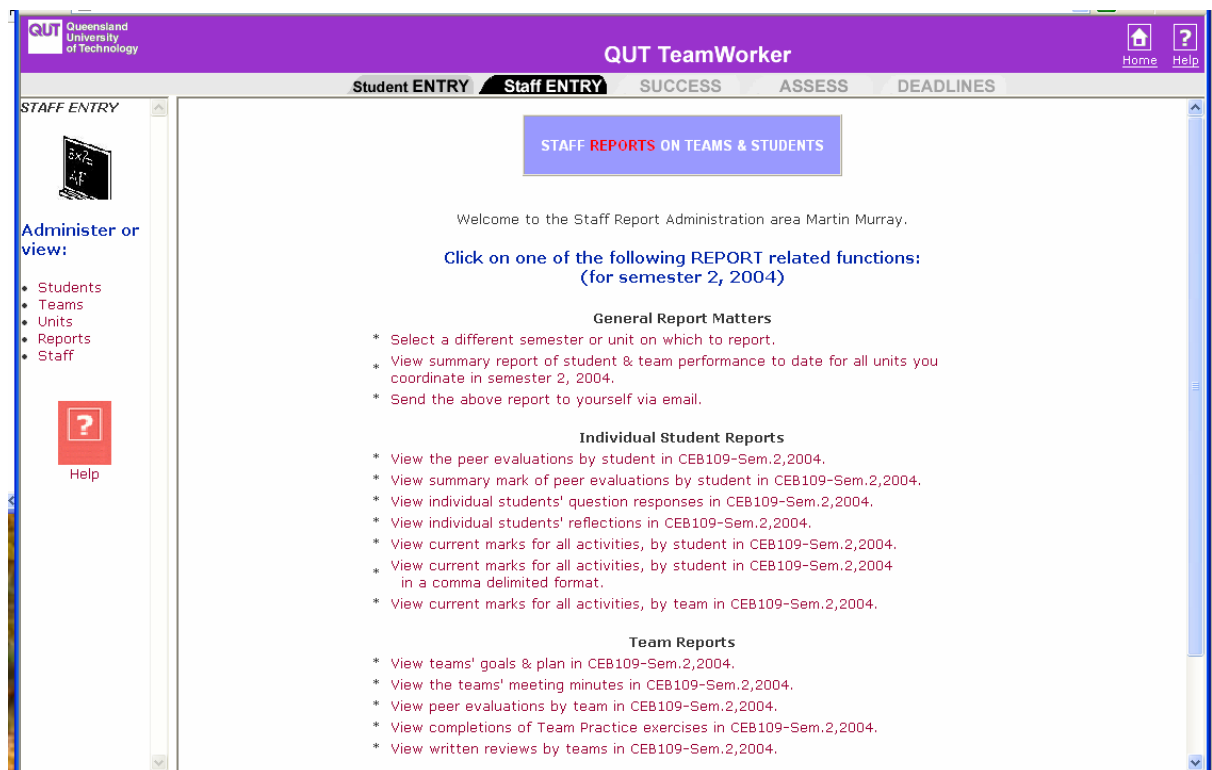


Figure 2. TeamWorker Screen Showing Reports Teacher Can Access (Right Frame) and Other Administrative Options for Teacher (Left Frame)