Examining the role of team wikis and team collaboration: A Student Perspective

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ABSTRACT

This paper reports on preliminary findings of an exploratory survey study of 199 undergraduate students' perceptions of their experience of using wikis as a collaborative tool for a team-based project. It was found that when students are provided with a tool like wikis, they use the tool and view it as a useful collaborative learning tool. However, when problems with the tool were encountered students fall back on the use of familiar technology such as social media and email. Students are thus not averse to using technology they are familiar with to support their studies and the wikis did not have to be assessed on their use of wikis to encourage student use of the collaborative learning tool.

Keywords: virtual teams, virtual work, business education, management courses.

BACKGROUND

The role of higher education in providing students with the skills and knowledge to participate in a continually changing workplace is no doubt considered of utmost importance to government, the business sector and the higher education sector. The Workplace Futures: Realising Our Human Capital Potential Task Group Report (Victorian Employers' Chamber of Commerce and Industry, 2009) points out that the shift in the nature of the workplace has meant that there is more pressure to ensure that employees have the right skills and knowledge for new types of workplaces; particularly work places that require collaborative and technological skills including the ability to work in virtual teams. Similarly the Business Council of Australia (2011) supports the role of Australia's higher education sector in the development of students' generic skills including collaboration skills and the utilisation of technology. Universities around the globe are working towards developing the skills, knowledge and abilities of university graduates beyond the disciplinary content knowledge with the growing need to develop students' generic skills that will best prepare them for the world of work and as members of society (Barrie, 2007, 439). Teamwork, collaboration and technology skills are among the generic skills considered as significant. Emerging technologies, such as those that fall under the umbrella of Web 2.0 technologies, which include technologies that allow for collaborative work between students such as the use of wikis, are increasingly being viewed as an important component of education.

Whatever career or job that students set out to attain, their position responsibilities will require them to work effectively in one or more teams since it is well known that work teams are central in organisations. More than fifty per cent of staff employed in eighty per cent of *Fortune 500* companies work in teams (Clark & Gibb, 2006). Teams at work are made up of individuals who share responsibility and accountability to carry out work (Kirkman & Mathieu, 2005, 70). Organisations of all types employ teams to manage project work, facilitate cross-departmental communication, facilitate innovation, and introduce a global perspective to their business practices (Ebrahim, Ahmed, & Taha, 2009).

With the increasing use of virtual teams in the workplace (Clark & Gibb, 2006; Ebrahim, et al., 2009; Townsend, Demarie & Hendrickson, 1998), the skills required to adapt to working in a virtual team is becoming paramount. Virtual teams are teams made up of individuals that are located in different places and time zones who share responsibility and accountability to carry out work. Communication technologies allow members of virtual teams to work together despite their geographic location in time and space. More than fifty per cent of companies with more than 5,000 employees use virtual teams. For instance, PriceWaterhouseCoopers uses virtual teams as a way to get employees in different locations to work together while Whirlpool Corporation used a virtual team made up of experts from the United States, Brazil and Italy during a 2-year project (Bell & Kozlowski, 2002). Recently there are work teams that work both face to face and virtually and are not necessarily geographically dispersed. Such teams can still be regarded as virtual teams because it is

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the level of virtuality in terms of the technology used to communicate and collaborate that determines whether they are a virtual team and not the location of its members (Kirkman & Mathieu, 2005).

It is thus imperative that strategies must be set in place to ensure that students are provided with the opportunity to develop the knowledge and skills required to work in teams and to use technology that will enable students to develop the collaborative skills required for the newly emerging virtual work place. To work collaboratively requires that members of a team are engaged in coordinated effort to solve the problem, develop a product or understand concepts (Dillenbourg, Baker, Blaye & O'Malley, 1996). To collaborate online, requires that members can still work together in this coordinated manner (Alexander, 2002). To be provided with the experience of working in virtual teams is thus increasingly being considered important generic skills that will better prepare students for a modern workplace (Egea, 2002).

This paper will examine the strategies that virtual teams have utilised in the higher education sector, followed by an explanation of the steps taken to implement the wikis as a virtual tool to enhance collaboration in a large undergraduate management subject. The methods used to gather students' views of the use of wikis for a team-based assignment is outlined and the results and discussion of the findings will be presented. Finally a discussion on how such data can be used to enhance the use of wikis as a collaborative learning tool in management education will be presented and avenues for further research will be explored.

Virtual Teams in Higher Education

Wikis are one of the tools grouped under the label 'Web 2.0' technologies and are categorised as social software that enables users to collaboratively create the content rather than just simply be static users of the content (Frydenberg, 2008). Essentially, wikis are websites that can be edited by multiple users and can be used as a collaborative writing and knowledge sharing tool. The use of wikis for team based projects can therefore facilitate interactive, collaborative and creative learning environments (Mindel & Verman, 2006) and are useful because a record of all the steps that have been taken to produce work is stored and can be tracked (Carr, Morrison, Cox & Deacon, 2007).

Steps have been taken to integrate technologies into curriculum that allows students to work collaboratively online. Bruns and Humphreys (2005) argue that in order for students to be successful in our highly informational, networked work environment, they must be able to critically assess the information that they have access to and be able to work creatively and collaboratively with others to do so. They explore how wikis can be used as part of social constructivist pedagogical practice which sets out to develop university students' technology and collaboration skills. Birch and McDonald (2007) put forward the case for compulsory virtual team work and emphasise the importance of building social and collaborative learning via virtual team assignments.

Assessing to what extent the use of wikis and thus virtual team projects encourages or enhances collaboration is required in order that we understand how we can best begin to ensure that

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students are provided the opportunity to develop the knowledge and skills to work in this new and continually changing workplace. While there are research reports on the positive outcomes of wikis in facilitating collaboration (Clark & Gibb, 2006; Elgort, Smith & Toland, 2008; Gibbings, Lidstone & Bruce, 2008; Thomas & Minocha, 2007), there are others that are less positive. For instance, it was found that the implementation of using virtual technology does not automatically result in collaboration between team members (Alexander, 2006; Carr et al, 2007; Cole, 2009). Although wikis can successfully be used for student collaborative writing, the design of the wiki tool itself can actually hinder collaborative writing (Forte & Bruckman, 2007). An important finding by Elgort, et al (2008) was that the use of wikis did not improve students' attitudes about teamwork because students generally prefer to work on individual assignments rather than group assignments. However, students considered wikis to be useful for arranging information and sharing knowledge. Judd and his colleagues (2010, p. 342) also demonstrate that the presence of wikis in a subject or course will not automatically result in collaborative behaviour between members and in fact students lacked the capacity and willingness to develop cooperative and collaborative behaviour.

Kennedy, Judd, Churchward, Gray and Krause (2008) ague that by simply asking students to use a technology to support their university studies assumes that all students have the same experiences and skills and desire to use the technology to support their university studies. Students now entering Australian universities use a wide range of technologies such as mobile phones, the internet and email (Kennedy et al, 2008) and the majority of students use the web for study purposes (Krause, Hartley, James and McInness, 2005; Oliver & Goerke, 2007). However students skills and experience using Web 2.0 technologies, which includes wikis, was varied rather than uniform among the first year cohort with most reporting that they were unlikely to use these emerging technologies (Kennedy et al, 2008). Even though more recent studies indicate that there has been an increase in the use of social networking software, blogs and wikis, overall usage is still quite low (Kennedy et al, 2009). Nevertheless, in assessing the implementation of new technology in higher education, Kennedy et al (2009) report that although students were quick to develop competencies to use tools, only a minority reported positively about the academic purpose and relevance of using such technologies. There was also a diverse range of opinions among the students as to how the technology helped them develop discipline knowledge and technological skills. It was found, however, that students tended to be more positive about the technology supporting their learning if the technology was well integrated into the curriculum and assessment (Kennedy et al, 2009).

The next section provides an overview of the implementation of wikis as a collaborative tool in a large undergraduate management subject and the methods chosen to collect students' perspective of the use of wikis for a team-based project are outlined.

STUDY CONTEXT

Wikis have been introduced in a large second-year undergraduate subject in a Department of Management & Marketing in order that students, who mostly work face-to-face on a team-based assignment, are also provided with a virtual space whereby members from each team can also remotely work together in the research, development and completion of a team-based assignment. Learning about teamwork is one of the core subject objectives and thus the team-based assignment provides students both the opportunity to gain theoretical content knowledge and practical experience of teamwork. Students are required, by week three of the Semester, to form Assignment Teams of four or five people from within their tutorial group to complete the Team Assignment by week nine of the Semester. All members of an assignment team receive the same mark for the team assignment which contributes to 30 per cent of the overall individual mark that each student receives. The assignment requires that each assignment team acts as a consultancy team. They must work collaboratively to solve an organisational behaviour problem by analysing the case study problems and providing a set of recommendations to solve the problems identified and analysed in the case. One question on the final exam that contributes to 25 per cent of the exam result requires that students reflect on their team-based experience using team and leadership theory.

The team-based assignment is an important part of the subject because teamwork is a skill that will enable students to succeed in their career. Team-based assignments provide an important way to increase students' knowledge and skills in relation to teamwork and confidence to participate effectively in collaborative learning as a team member while respecting individual differences. Employers increasingly seek teamwork experience and teamwork is increasingly a regular feature of working life. Team building skills are important for today's managers since teams have become the basic building blocks of organisations and the ability to build cohesive teams in an environment of diversity and dispersed decision making is paramount (Hackman & Wageman 2005).

While the acquisition of teamwork knowledge and skills is a key objective of the subject, working in teams raises a series of challenges within the teams. The key challenges include finding the best ways to encourage team collaboration, occasional "free-riding" or "social loafing" by members of assignment teams, students who do not necessarily have access to shared physical spaces where they can meet as a team to exchange ideas, articles, and drafts, and students who at times find it difficult to schedule mutually convenient meeting times. The introduction of wikis set out to respond to these challenges and thus further develop students' collaborative skills.

The wikis were set up using the subject's Learning Management System and each student team had access to their own team wiki space. Only those members assigned to that page and the tutor were able to access, add information, upload documents and comment on the wiki space. The tutors have been trained to be team coaches to the student teams via a specific tutor training program focussed on motivational and consultative team coaching (Sargent, Allen, Frahm & Morris, 2009). Since leadership and management of virtual teams are just as critical for virtual teams as it is for face-

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to-face teams (Bell & Kozlowski, 2002) the tutors were provided with additional training on motivation and consultation of virtual teams.

Apart from online guidelines addressing how to use the wikis, students were not provided with any formal training on how to use the wikis. If students sought assistance from their tutor, the tutor would provide guidance in person, via email or over the telephone. Students also have access to help services offered by the LMS (Learning Management System) staff.

Each team was asked to upload a team contract to their team's wiki page, which enabled the tutor to read over the contract while it was being prepared, give feedback and advise the team about the contract. By Week 4 of Semester students were informed that the wiki page was the team's private workspace and that the tutors would only access the pages if they were invited to do so by each team. The student teams were not assessed on their wiki use, it was there to support the students' completion of the team assignment.

METHOD

This study utilised a survey, comprising both open-ended responses and yes/no dichotomous questions, to ascertain from the students' perspective their prior experience and knowledge of wikis, to assess the extent that students used the wiki and to understand students' opinions on the usefulness of wikis as a tool for collaborative work. Students voluntarily participated in the study by completing the survey during the final lecture at the end of the Semester. The survey consisted of eight questions (see Appendix 1) and included the opportunity for students to provide comments on four of the questions outlining the reasons for their particular response. Demographic data relating to gender, age, Faculty enrolment and whether the students have an ESL background were collected. This data was also used to ascertain whether demographic differences had an impact on student's use and view of the wiki. Data about students' prior use of wikis in their other subjects and their view of the ease of using the wikis with and without prior experience and training was also collected.

There were 659 students enrolled in the subject in Semester 2, 2010. Of the 659 students 199 students responded to the survey (30% response rate). Equal numbers of males (47%) and females (46%) completed the survey, most students were between the ages of 19 and 21 (79%), were enrolled in the Faculty of Business & Economics (84%) and 32 per cent have an ESL background and 55 per cent were not. Of the 199 students who responded to the survey, 146 students (73%) used the wiki and 53 students (27%) did not. There was no significant difference between males and females in their use of the wikis (66 males students compared to 72 female students). More students without an ESL background (78 students) used the wiki in comparison to students with an ESL background (53 students).

Data was collected via open-ended questions which asked students to respond to questions regarding their experience using the Team Wiki in the completion of their team assignment during the Semester and their views on the use of the wiki for academic purposes. A thematic analysis of the

student responses to the open-ended responses was conducted in order to determine the shared meanings of students' experience and view regarding the use of the wiki in the completion of the team-based assignment. A phenomenological analysis of the responses sets out to describe the meanings from the view of several individuals rather than the single individual. A phenomenological analysis is interested in the 'lived experiences' of a given social phenomena and thus the focus is on what all the individuals have in common as they describe their experience (Creswell, 2007, 57-8).

Students' responses were imported into NVivo 9. The process of analysing the data was conducted through the operations of 'open coding' as advocated by Strauss and Corbin (1994). Open coding refers to naming and categorising phenomena through a close examination of the data (Strauss & Corbin, 1994, p. 62). An inductive process was adopted by drawing out the meanings that stood out in each of the responses. Each of the meanings were categorised and given a label. Each category was compared by identifying the similarities and differences and further categories were developed. Each of the categories was given a coding name.

RESULTS

One hundred and nine-nine out of the 659 enroled students (30%) completed the survey. The analysis of the survey results and the responses are presented in the following section under four themes: the level of students' prior experience of using wikis, how the wikis were used during the semester, students' view of wikis as a collaborative tool, and students' view of the wikis for academic purpose and relevance.

Prior experience using wikis

Students were asked about their prior experience using wikis. Of the 199 students the majority of the students had not used wikis in any of their other subjects (74%). Students were asked whether they found the wikis 'easy to use' without prior experience and without training. The majority of students stated that they found the wikis easy to use without prior experience (72%) and without training (74%).

How the wikis were used

Seventy-three per cent of the students (146 students) who completed the survey stated that they used the wiki to work on the team-based assignment. Students used the wiki in a range of ways. Of the 146 students who used the wiki, 104 students (71%) used it to develop the team contract, 141 student (96.5%), to post the team contract on the wiki, 65 students (44.5%) to communicate with team members, 74 students (51%) to deposit research materials, 58 students (40%) to compile a reference list, 66 students (45%) to write a draft of the team assignment and 29 students (20%) to keep a reflection log on their team experience.

Student's view of wikis as a collaborative tool

All students who completed the survey were asked to indicate how useful they found the wikis for the team-based assignment. Eighty one students (41%) stated that they found the wiki useful and 112 students (56%) did not find the wiki useful. There was not a significant difference between males and females in the opinion of the usefulness of the wikis, with 37 males and 40 females stating that the wikis were useful. Students without an ESL background (49 students) stated that they found the team wiki useful in comparison to 22 students of ESL background who stated that the wikis were useful. The majority of students (80%) provided a comment to explain their reason as to why they found the wiki useful and how they view the use of wikis for academic purposes.

As illustrated in Table 1 students view wikis as a way of promoting collaboration between team members (62 responses). Students pointed out that the wikis are a good way of promoting collaboration between members because it was a useful tool for sharing information, ideas, providing each other feedback and a useful way to communicate with team members.

> *It acts as a common portal for team members to communicate and it prevents any complications that arise from the confusion of sending emails to each other. It facilitates any changes to the report by different people on the team.*

A number of students (24 responses) pointed out that role of the tutor in monitoring, assessing and providing feedback via the wikis also contributed to encouraging team collaboration. For instance, one student stated that the tutor's comments via the wiki would 'perhaps … encourage members to keep updated about the content on the wiki's. Yet, a majority of students stated (70 responses) that they chose to use other wiki options with many students choosing other tools such as Google.docs and social networking tools such as Facebook (15 responses) and communication tools such as email, MSN, texting (48 responses). For example:

> *Google.docs was more useful as everyone could change the assignment and work on it simultaneously. The team wiki required a couple more steps to edit the work. Google.docs was also easier to use.*

A minority of students (6) pointed to the preference of using face-to-face contact only to collaborate with their team members (see Table 2). For some students (31 responses), the problems they faced using the technology was the reason they did not use or continue to use the wikis. For instance, reference was made to the technology not being user friendly, slow, and/or that the LMS portal was always down and unreliable (31 responses) (see Table 3). For example:

> *The team wiki was very slow to load, making it difficult to view the pages or upload materials*

> *LMS portal is always down and difficulties often arise to access the team wiki.*

Other students (26 responses) stated that since the wikis had limited features because it did not have the tools that allowed for collaboration, for example, it did not have email notification, and

synchronized discussion, it was not a useful tool to work collaboratively with team members (see Table 4). For example:

> *It seemed useful at first during brainstorming stage. However when we started writing the report, we needed to meet in person or send emails, this way were much more interactive since wiki didn't have notification for members when there was a new post on.*

Students' view of academic purpose and relevance of wikis

Students were asked to indicate their view of wikis for academic purpose and relevance through questions about receiving feedback from their tutor on team formation, collaboration and progress towards researching and completing the Team Assignment as well as monitoring and assessing students' contribution to collaboration.

As highlighted in Table 5, wikis were viewed as a good tool for providing the channel whereby tutors could provide feedback to the team so that a team could improve their progress in terms of understanding requirements of the assignment, and assisting in producing a better quality assignment and motivating teams to actually complete the assignment (71 responses). For example:

> *To see if our approach is fine and see if the group is lacking behind and sort of give us some pressure in doing the stuff more efficiently.*

> *We know how well we are going and make sure we are in the right direction, can provide motivation for us to put more effort into the assignment.*

For some students (43 responses), wikis are viewed as a convenient platform for ensuring that level of member's collaboration is transparent to other members but most importantly to the tutor. Such students saw the value in being monitored and assessed on a members' contribution to the wikis with the focus on monitoring and assessing individuals rather than a team (see Table 6). For example:

> *We can check the time and date when students contribute their work.*

> *The actual work of every team member's contribution can be judged.*

A number of students (42 responses) cast doubt on whether wikis are useful for academic purposes; that is, some students refer to the problem that the wiki does not allow others; particularly the tutor, to have a true picture of how the teams collaborate. Such statements highlight the concern students have with using wikis for team based assignments and being assessed on their wiki use. Overall, such students shared the view that wikis are not a feasible option to monitor or assess collaboration via the wikis since they believed that collaboration is more than just what is presented on the wiki pages (see Table 7). For example:

> *Other mediums are preferred options; contribution of some members may not be visible if they haven't used the wiki.*

> *People can only contribute a small bit – wiki doesn't allow you to see how much has been contributed.*

Thus the tutor's role as a way of motivating and developing individual students' level of contribution was favoured over monitoring and assessing the level of collaboration of the whole team. The wiki, overall, was seen as a collaborative tool rather than as a way to assess students (see Table 8). For example:

> *I think it's better if the wiki is kept between team members only, otherwise team members may feel more aware of the formatting and quality of posts/comments/information, like they are constantly being judged which is not ideal during the initial stages of research.*

DISCUSSION

The overall focus of this research has been to understand the effectiveness teaching and learning of collaborative skills among students through the use of wikis for the completion of a team-based assignment. The purpose of the research was to ascertain the role of wikis in enhancing collaboration skills and students' perceptions of their experience of using wikis as a collaborative tool for a team-based assignment. The findings from this study demonstrate that when students are given a tool like wikis to complete a team-based assignment, students will more likely than not set out to use the tool, however if they face problems with the tool they set out to use other technology to communicate and/or collaborate in the completion of the assignment.

It has been demonstrated that the students used the wikis for a range of tasks, from completing and posting a team contract and work schedule, to communicate with team members, compile research and write drafts. Gender, age, and Faculty did not determine whether the students used the wiki or not. This study demonstrates, however, that fewer students who have an ESL background used the wikis and found the wikis useful as compared to those that had English as a first language. Such a finding may support Kennedy et al.'s (2008) study which suggests that students do not enter university with the same technological skills and experience. However, previous research has demonstrated that team members, regardless of their culture, indicated that they feel less confident in their ability to work in a virtual environment than in a face-to-face environment and that team members from collectivist cultures had lower self-efficacy beliefs (both group and individual confidence in working with the technology) than members from individualist cultures (Hardin, Fuller & Davison, 2007). Yet, a group level analysis of student teams found self-efficacy of diverse teams was found to be stronger (Sargent & Sue-Chan, 2001). Future research needs to be conducted to explain the differences between ESL students and non-ESL students in a virtual team environment.

In addition, the majority of students did not have prior experience or training on using wikis. This finding aligns with the study by Kennedy et al. (2009) that students tend to have had little experience with a wiki tool prior to encountering it in the subject. This study also demonstrates that students are not provided the opportunity to use tools like wikis in their first year of university study since the majority had stated that they had not used the wikis in other subjects previously. Nevertheless, this study demonstrates, as shown by Kennedy et al. (2009) that students' are quick to develop the competency to use new tools, the majority of the students in this study stated that they

found the wikis easy to use without prior experience and training in using the wikis. In fact it was the problems with the technology and the limited features of the wiki platform that tended to be the reason that students chose not to use the wiki or found that the wiki was not a useful tool.

The conclusions drawn from the analysis of the students' responses indicate that the students perceived the wikis as a useful collaborative tool when they believed it provided the team a space for collaboration by sharing information and ideas, provided the ability to compile information, allowed the team to communicate and progress, and when the information communication technology itself provided the means to do so. The three main reasons students did not find the wikis useful was when the wikis were considered an unreliable technology, when it was considered inferior to other forms of communication tools such as email, MSN, and Facebook and inferior to other wiki tools such as Google.docs. For many students, therefore, the choice to use other online collaborative tools was made rather than not using any communication and collaborative technology at all. The technology that they tended to use were those that they felt most comfortable with, that is mobile phone (texting), email, MSN, Facebook and Google.docs. In contradistinction to the findings of Kennedy, et al. (2009) the findings of this study illustrate, that students are in fact not averse to the idea of using technology they are already familiar with and already using in their personal life to support their university studies.

This study, however, also supports the finding by Kennedy et al (2009) that if the technology is integrated well into the curriculum and assessment then there is likely to be a more positive opinion of its usefulness for academic purposes. It also highlights that it is imperative that the right tools are provided to allow for students to be able to collaborate successfully. The students in this study accepted that the wiki was an integral part of their team assignment even though they were not being assessed on the use of the wikis; this is evident by the fact that the majority of students chose to willingly use the wiki. An important finding of this study is the fact that students used the wiki even though they were not going to be assessed on their use of it. This contradicts the notion that assessment drives students' engagement with learning (Biggs & Tang, 2007); in fact students' view of wikis for academic purposes and relevance is understood through the comments that inform us that students view the wikis as a useful way to encourage team collaboration and learning rather than as a means to assess them. This is further elucidated by student comments that view the tutor's role as being positive in encouraging collaboration and providing feedback via the wiki as a way to enhance their progress and quality of the completed assignment. The results can be explained with a consideration of the role of team processes feedback which explains that ongoing team processes feedback leads to an increase in motivation, satisfaction and performance of virtual teams (Geister, Konradt & Hertel, 2006). Future research of the impact of motivation could examine whether there is a difference between those who value and benefit from the feedback, that is, is there a difference between highly motivated or less motivated members in terms of the perceived value and benefits received from the feedback?

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In terms of a desire to be monitored or assessed, the only time that students seemed to be in favour of being monitored or assessed on their wiki use was in order that individual student's level of contribution could be monitored and accounted for when team members were perceived as not having contributed adequately or not at all to the team assignment. Some students were concerned that the team's level of collaboration is not clearly represented by the wiki and thus it would be better if the tutor did not specifically monitor and/or assess team collaboration. Thus the tutor's role as a way of motivating and developing individual students' level of contribution was favoured over monitoring and assessing the level of collaboration of the whole team. In addition, some students felt that if the team was aware that they were being assessed then it would lose the purpose of the wikis as a collaborative tool. In addition, students were particularly concerned that collaboration takes place in a range of forums and thus assessing collaboration on the wiki underestimates the value of the collaboration that takes place in other settings, such as via the use of other tools and face-to-face meetings.

If we are to continue to use wikis as an effective tool to enhance students' skills, knowledge and experience to better prepare students for the future work organisation, then we need to view the use of such technology in terms of the learning goals (that is, students set goals for learning by using the wikis, collaborating with team members and receiving feedback from the tutor), rather than performance goals (that is, the level and quality of collaboration and the final end product – the assignment that has been produced by a team); in other words, rather than focusing on the end result the focus should be on the discovery and enhancement of effective strategies or processes that are needed to complete the team project. With the rapidly changing workplace, organisations require that a high performing workforce consist of those with ability and motivation. In this way, employees should be encouraged to have both learning goals and performance goals. Performance goals are said to motivate employees to perform. However, without learning goals the abilities to perform will not be achieved. The learning goals (the goals to attain the abilities to perform) are thus required before the performance goals can be set (Seijts & Latham, 2005).

The findings from this exploratory study demonstrate the role that higher education can play in contributing to providing students with the skills and knowledge to participate in the continually changing workplace. The shifts in the nature of the workplace have meant that there is now more pressure to ensure that employees have the right skills and knowledge for new types of workplaces; particularly work places that require collaborative and technological skills including the ability to work in virtual teams. This study demonstrates that developing projects that aim to enhance collaboration with the use of technology can allow universities to work towards developing the skills, knowledge and abilities of university graduates beyond the disciplinary content knowledge that best prepare them for the world of work and as members of society.

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Appendix 1

Student Survey

Team Wikis and collaborative learning in the subject Organisational Behaviour (325-201)

THE UNIVERSITY OF
MELBOURNE

1. Did you use the Team Wiki for Organisational Behaviour this Semester?
    Yes ☐ No ☐

2. If yes, did you use the Team Wiki to do any of the following (you can tick more than one)
    - To develop the Team Contract ☐
    - To post the Team Contract ☐
    - To post a 'work schedule' ☐
    - To communicate with the team members ☐
    - To deposit research materials ☐
    - To compile a reference list ☐
    - To write drafts of your Team Assignment report ☐
    - Team Reflection Log ☐

    Any other, please list:

3. Did you find the Team Wiki useful? Yes ☐ No ☐

    Please explain why/why not?

4. Do you believe that it would be beneficial if your tutor regularly commented on your Team Wiki about your team formation & team collaboration and progress towards researching & completing the Team Assignment? Yes ☐ No ☐

    Please explain why/why not?

PLEASE TURN OVER THERE ARE SOME MORE QUESTIONS

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5. Do you believe that the Team Wiki is useful for monitoring students' contribution towards collaborative work? Yes ☐ No ☐

 Please explain why/why not?

6. Do you believe that the Team Wiki is useful for assessing students' contribution towards collaborative work? Yes ☐ No ☐

Please explain why/why not?

7. Have you used Team Wikis in any of your other subjects? Yes ☐ No ☐

8. Was the Team Wiki easy to use without:

- Training? Yes ☐ No ☐
- Prior experience? Yes ☐ No ☐

Table 1: Wikis promote collaboration

Description	Illustrative Quotes
Students pointed out that the wikis are a good way of promoting collaboration between members (62 comments) because it was a useful tool for sharing information, ideas, providing each other feedback a and a useful way to communicate with team members.	Provided a common place for everyone to share anything they had. Given that we could set different pages for different sections; It acts as a common portal for team members to communicate and it prevents any complications that arise from the confusion of sending emails to each other. If facilitates any changes to the report by different people on the team. It allowed the group to always have a copy of the most up to date information/copy of the assignment available.
A number of students (24 comments) also pointed out that role of the tutor in monitoring, assessing and providing feedback via the wikis also contributed to encouraging team collaboration.	[tutor comments on contribution & collaboration] would facilitate the use more [Tutor comments] perhaps it would encourage members to keep updated about the content on the wiki [Tutor comment useful] more emphasis would be placed in incorporating the wiki into the group's process.

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Table 2: Alternative collaboration preferred

Description	Illustrative Quotes
A majority of students stated (70 comments) that they chose to use other wiki options with many students choosing other wiki tools such as Google docs of social networking tools such as Facebook (15 comments) and communication tools such as email, MSN, texting (48 comments)	Much better to use a collaborative tool such as Google.docs; works on the same principles as the wiki but implementation is better. Team wikis' necessity seems to have diminished because of social network method of communication what is already available, i.e. Facebook, mobile/email. Not really [useful], my group use dropbox instead because it can sync our files directly.
A minority of (6 comments) stating that they preferred to just work using face-to-face contact only.	Our group members prefer face to face meeting. There was no incentive to use team wiki rather than meet face-to-face Too troublesome, email is enough …meeting up is better.

Table 3: Problems with technology

Description	Illustrative Quotes
Students viewed the technology as a problem and hence the reason they did not use or continue to use the wikis. Such comments made reference to the technology no being user friendly, slow, and/or that the LMS always down and unreliable. (31 comments)	Very clumsy and unfriendly interface. Very slow, We found it more convenient to send doc. Or PDF or jpg (scans from books read) files of research materials, drafts, etc to each other. Team Wiki couldn't do this, had to type text in. Inconvenient, time-consuming. LMS portal is always down and difficulties often arise to access the team wiki. .

Table 4: Limited Features

Description	Illustrative Quotes
Students stated that since the Wikis did not have features that allow for collaboration/easy use, for example, email notification, synchronized discussion it was not a useful tool to work collaboratively with team members (26 comments).	It was a convenient way to post up comments and notes. However because there is no control over when other teammates would check and respond, sometimes it was a source of confusion/miscommunication. It would add to its usefulness if notifications of posts could be linked to perhaps email which is checked more often. It was too difficult having to use other forms of communication to notify team members to look at the wiki. It's not practical for use because it's not real time based and we don't know if it's updated when it's updated. Need real online chat base otherwise it makes it hard to communicate. It seemed useful at first during brainstorming stage. However when we started writing the report, we needed to meet in person or send emails these way were much more interactive since wiki didn't have notification for members when there was a new post on.

Table 5: External Feedback (collaboration with tutors)

Description	Illustrative Quotes
Wikis were viewed as a good tool for providing the channel whereby tutors could provide feedback to the team so that they could improve their progress in terms of understanding requirements of the assignment, the final assignment quality and actually completing the assignment (71 comments).	[Tutor comments useful] because it would correct our mistakes and encourage us to do the work much better. [Tutor comment would] ensure an efficient team formation and that the team is progressing well. We know how well we are going and make sure we are in the right direction, can provide motivation for us to put more effort into the assignment.

Table 6: Level of contribution transparent

Description	Illustrative Quotes
For some students, wikis are viewed as a convenient platform for ensuring that level of member's collaboration transparent to other members but most importantly to the tutor (43 comments). Such students saw the value in being monitored and assessed on a team's contribution to the wikis; however the focus seems to be about monitoring and assessing individuals rather than a team.	We can check the time and date when students contribute their work. Able to see how much each person contributes to the assignment The actual work of every team member's contribution can be judged.

Table 7: Not a representation of collaboration

Description	Illustrative Quotes
A number comments (42 comments) refer to the problem that the wiki does not allow others; particularly the tutor, to have a true picture of how the teams collaborate. Such comments highlight the concern students have with using wikis for team based assignments and being assessed on the wiki use. Overall, they did not view it as a feasible option to monitor or assess collaboration via the wikis since they believed that collaboration is more than just what is presented on the wiki pages.	Other mediums are preferred options; contribution of some members may not be visible if they haven't used the wiki. Students many don't put everything in team wiki hence a wrong impression created. Could be a good way to monitor who is posting on the wiki, but it is hard to show what work has been done before posting.

Table 8: Negative view of monitoring and assessment of wiki use

Description	Illustrative Comments
Students who stated that the wikis was viewed negatively because they did not need to be monitored/assessed (7 comments)	Because tutors actually do not know too much about how far students are up to their team work. Even though there are team schedule, everything can change accordingly, not exactly as the schedule lists. Tutor should only provide feedback when requested by group – otherwise, teams feel 'nannye-ed'; poor preparation for real world; also, teams develop shared language/way of doing things that the tutor may not understand. I think it's better if the wiki is kept between team members only, otherwise tem members may feel more aware of the formatting and quality of posts/comments/information, like they are constantly being judged which is not ideal during the initial stages of research.