LITE Seed Grant Proposal

a) Project Title: Enhancing Teamwork Effectiveness in Coursework through Training

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b) Project goals/outcomes and research question(s) to be investigated

We seek to demonstrate that when students receive prescriptive training concerning how best to organize and carry out work in teams connected with their coursework, the quality of teamwork processes and team products will be enhanced along with teamwork satisfaction, attitudes and motivations. Moreover, in coursework-related teams, teamwork effectiveness is expected to yield deeper learning.

An outcome within the scope of the LITE Seed Grant will be the production of a teamwork training module designed to be widely-applicable across a wide range of courses. The training material includes several generic "podcast"-type videos and illustrative, optional course-specific supplements.

c) Project rationale and description, including review of relevant literature

As instructors of UW undergraduates, we have observed that some assignments submitted by teams have shortcomings that could have prevented by better teamwork. We have watched the "process" of these teams—how they work together during class time—and noticed that instead of working as a team, they often divide up the work with little interaction and ultimate integration. Students appeared to have little knowledge about effective teamwork practices. In the worst cases, students have appeared passive, demonstrating little idea of where to begin and how to proceed as a team that can work toward an assigned product.

Team *contracts* are often used by instructors to enhance teamwork effectiveness. This emphasis assumes that the core of the problem is lack of motivation. Team contracts have their place, but they cannot compensate for lack of teamwork knowledge and skill. Additional indications of students' knowledge and skill gaps appeared when we surveyed students about aspects of their team work in the undergraduate Training and Development course (PSYCH340) in Fall 2011. Establishing a common goal for the team is a fundamental requirement for effectiveness, yet more than 50% of respondents reported that they spent little time to discuss areas of agreement/disagreement about the goals of their assignment. Agreeing upon how to work together is another of the fundamentals, yet nearly 25% of respondents did not explicitly discuss as a team how they should work as a team or whether they were working effectively.

Indeed, greater motivation to apply oneself to teamwork could be an *effect* of acquiring and acting upon better knowledge and skill for teamwork. One line of theory and evidence for this claim comes from Bandura's concept of self-efficacy (1977) which has a counterpart in team self-efficacy (Edmondson, 1999). In theory, students with some confidence in (i.e., self-efficacy for) their capacity to work as a team can be expected to exert more effort toward reaching the team product goal.

If the proposed project provides a way of improving course-related teams' effectiveness, enhanced learning should result. Instructors generally use teams because it is in these settings that motivation and comprehension are expected to increase, as through active learning and mutual sharing and analyzing of ideas (e.g., see the report of The Task Force on Innovative Teaching Practices to Promote Deep Learning at the University of Waterloo). Teams with "process" difficulties in terms of coordinating, communicating, supporting, and producing cannot maintain the levels of analytic, integrative, and creative work that yields deep learning.

Generic Team Training

Our project presupposes that a set of principles and practices for teamwork exists and it is broadly applicable across not only disciplines but also types of work and products. Decades of research in social and organizational psychology and in management has generated consensus about basic distinctions that are widely applicable and useful (Schein, 1980). The most basic distinction is between what teams must do to organize their tasks and what they must do to maintain the working relationships between team members. The training program that we have developed takes this distinction as a starting point, explains it, and illustrates it. Thus for example on the task side, students are instructed to make explicit to one another the goals for their task and the means to reach these ends. On the relationships side, the impacts of *how* people communicate with one another are described and illustrated, and instruction is given in how best to maintain mutually supportive relationships in team work (see Appendix A based on a handout given to trainees. We also draw upon literature specifically on problem solving (e.g., Hurson, 2008) to provide a structured framework for teamwork. This framework begins with reaching agreement about the task and goals, then identifying available and needed resources, and so forth (see Appendix B).

Overall, it will take students approximately 1.5 hours to complete the program. The training material includes online podcasts (voice-over-PowerPoint), a demonstration video, printed job aids, and group activities.

Plan/methods/procedures for carrying out and assessing the project

The requested seed grant support is for a pilot study within Psychology 340, Training and Development, Fall 2012. Enrolment will be approximately 150, yielding 30 project teams. Half of the teams will be randomly assigned to the "treatment" group, receiving our "Team Task- and Relationships-Management Training." The other half will be assigned to a comparison or "control" condition, receiving "Team Roles Awareness Training." The latter training will be patterned after existing practices for team building and team contracting in some courses at UW and elsewhere. (It will not be identical to existing approaches because it must be made parallel in form to the focal treatment approach.) Use of this treatment as a control condition ensures fair treatment of all students in the course in the sense that no one will be deprived of an educational experience believed to enhance team effectiveness. However, we predict that the more focused

and prescriptive nature of educational experience received by the "treatment" group will ultimately yield higher performance as scored by T.A.s (with rubrics developed in past years) when weekly team assignments are turned in. An R.A. will further score creativity (based on novelty *and* appropriateness, following Amabile, 1996) displayed in submissions for two assignments that lend themselves to such scoring. Of course all such scoring will be done without awareness of the teams' experimental conditions. Other outcome measures, based on survey questionnaires at the end of the term, will involve students' perceptions and reported behaviours. For the former we will assess team self-efficacy and team psychological safety climate (Edmondson, 1999). For the latter our survey will ask about the extent to which the behaviours prescribed in the treatment condition actually occurred, such as use of the particular problem solving approach and proactive relationships-management behaviours. A possible source for corresponding survey items is Tasa, Taggar, and Seijts (2007).

The survey will be designed so that even if we do not obtain statistically significant differences between groups, we will gain insight into the perceived benefits of the training and areas for improvement.

In addition to the preceding aspects of "outcome" evaluation, we will also conduct "process" evaluation in the sense of tracking students' exposure to training materials and learning of the material (using an on-line quiz).

Timeline

2012 July-Aug	Produce parallel material for control condition
	Finalize instrumentation
	Apply for ethics approval
	Finalize study materials
September	Deliver training
Mid-term	Objective performance and creativity measurement
November	Subjective survey measures
2013 Jan-Mar	Data base construction Data analysis
April-May	Produce academic and dissemination reports
June 2013	Submit reports to applicable outlets

Outline of project's broader impact – contribution to the uWaterloo community and beyond

The primary thrust of this project as a whole is to enable a large proportion of team-involved courses at UW to draw upon our team training materials. Thus we have taken a generic-yet-course-related view of what to cover and how to cover it. We have implemented some of the content in an online format to further promote its use, while building in the possibility of tailored elements for instructors who want to expand a bit on the coverage of teamwork skills in their courses. Our research could have wide impact across educational settings if our relatively more prescriptive training can be shown to be superior to the team building or team contracting approaches that are being widely used.

Plan for dissemination

We would hope to see our training module in the Centre for Teaching Excellence online repository. Ownership of the material would be retained by the Industrial/Organizational Psychology graduate program at the University of Waterloo, which would grant all rights of use at the University of Waterloo without charge. Access by other universities of the materials themselves may or may not be granted (this is to be decided in accord with UW policies on intellectual property ownership). Publication of a research report in a suitable journal definitely will be sought. Descriptions of our approach and study findings also will be disseminated through educational media including departmental newsletters, the Centre for Teaching Excellence outlets, and Tomorrow's Professor (online newsletter).

References

Amabile, T. M. (1996). *Creativity in context: Update to the social psychology of creativity*. Boulder, CO: Westview.

Bandura, A. (1977). Self-efficacy: Towards a unifying theory of behavioural change. *Psychological Review*, *84*, 191-215.

Edmondson, A. (1999). Psychological safety and learning behavior in work teams. *Administrative Science Quarterly*, *44*, 350-383.

Hurson, T. (2008). *Think better: An innovator's guide to productive thinking.* New York: McGraw-Hill

Schein, E. (1980). *Organizational Psychology* (3rd ed.). Englewood Cliffs, NJ: Addison-Wesley.

Tasa, K., Taggar, S., & Seijts, G.H. (2007). The development of collective efficacy in teams: A multi-level and longitudinal perspective. *Journal of Applied Psychology*, *92*, 17-27.

Budget

1. Graduate Research Assistants - Finalize Study Design (x hrs X $ y/hr)	$
2. Graduate Research Assistants - Data Collection (x hrs X $ y/hr)	$
3. Graduate Research Assistants - Data Entry and Export (x hrs X $ y/hr)	$
4. Graduate Research Assistants - Data Analysis (x hrs X $ y/hr)	$
5. Graduate Research Assistants - Report Writing (x hrs X $ y/hr)	$
6. Materials including job aids, in-class handouts	$
7. Purchase of software for video/podcast editing	$
	funding for this item denied - ineligible expense
Total	$

Budget Justification

1. In addition to the cited sources, other sources will be identified and used to incorporate individual difference measures into the design. Training material parallel to existing material will be developed for the comparison (control) condition. Time and effort for ethics approval are also included in this category.

2. On-line survey questionnaires will be produced and implemented by the graduate assistants. Integration with the "Learn" portal must be worked out.

3. Some data are acquired automatically within the course website but they must be exported and reformatted for statistical analysis.

4. The graduate research assistants are highly knowledgeable about advanced statistical methods. Analytic methods may include factor analysis, multiple regression, and multilevel modeling.

5. The graduate research assistants will have obtained their master's degrees and have PhD student standing when the research is undertaken and conducted.

6. This item covers handouts given to all students.

7. This item enhances our ability to do video/podcast editing economically "in house" instead of "outsourcing" the task. Products such as Camtasia, SnagIt, and Photoshop CS will be considered.

Appendix A. Active Relationships-Management

Group "process" consists of what people say and do toward one another in a group—their behaviours while working on a task. These behaviours have consequences for group members' interpersonal relationships, motivation, and effectiveness.

When group members actively choose their interpersonal behaviours as means towards the following ends, they are more likely to manage relationships effectively.

- *Respectful interaction* is at its highest when members show that they treasure one another's contributions and well-being.
- *Energetic engagement* exists when members are intensely involved in teamwork, eager for learning or other development, and striving for excellence.

End Goals	Means
Energetic Engagement • Strive for excellence • Be open to novel ideas • Have an enthusiastic attitude	• Share constructive enthusiasm about team assignment • Set goals on quality of task • Praise: "great idea, I like that idea, nice one" • Challenge ideas: "Can you expand on that?", "Why are you saying …?"
Respectful Interaction • Make it safe to make suggestions • Make it safe to disagree • Get everyone to feel they're being heard	Make it safe to make suggestions • Praise: "Great idea!" "I like that idea." "Nice one." • Agree: "I agree" "I think so, too" • Support: "We haven't heard from (name) yet, what do you think?" • Consensus: "What do you think?" Make it safe to disagree • Disagree Respectfully: "I'm concerned that … because ..." Get everyone to feel they're being heard • Listen actively • Acknowledge: nodding, "thanks"

Appendix B. Systematic Task-Management

Teamwork is like other work—it involves transformations of inputs to produce assigned outputs.

Input	→	**Work process**	→	**Output**
Information expertise etc.		See steps below		Written answers, descriptions, designs, etc.

When group members adapt the following systematic problem-solving process to their situation, they are more likely to manage tasks effectively.

Step 1 (Envision Output)	**Step 2 (Identify Inputs)**	**Step 3 (Diverge)**	**Step 4 (Converge)**	**Step 5 (Completion)**
Reach consensus on: • Instructions or Task Assignment • End product	Identify available/relevant resources such as: • Textbook • Other media • Experience/expertise within the team • External expertise	Generate a wide variety of ideas, approaches, etc. as may apply • Offer new ideas or ideas that build on contributions with as little evaluation as possible • Ensure every member has been heard from	Evaluate ideas based on agreed upon criteria • Evaluate each idea – each member is an active evaluator • Document a short list of ideas or an approach to the task • Check for consensus	Produce final product • Coordinate members' contribution to the team product in an agreed upon way • Jointly integrate, review and revise • Submit end product
Throughout All Steps: Monitor progress in relation to time and deadlines. Be mindful of group process (other handout page).				