

## **EMPIRICAL RESEARCH**

# **Effects of Transparency and At-Stakeness on Students' Perceptions of Their Ability to Work Collaboratively in Effective Classroom Teams: A Partial Test of the Jassawalla and Sashittal Model**

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## **ABSTRACT**

While teams are common in business school classrooms, scholars note that few instructors provide teamwork-related instruction. The consequent negative experiences may explain the reported cynicism about teamwork among students. This article reports findings from a study that examined the link between a teaching strategy designed to help students function more effectively in teams and its impact on student perceptions of their ability to work collaboratively with others and on their perceptions of their team's effectiveness. The study found evidence to suggest that a teaching strategy designed to help students reach the multiple stages of team development such as high levels of at-stakeness and transparency positively impacts their perceptions and that these stages effectively mediate the link between the strategy and key outcomes.

***Subject Areas: Teams in the classroom, Teaching Approaches.***

## **INTRODUCTION**

Scholars agree that student teams can help create active learning environments and serve as high-quality pedagogical tools (Chowdhury, Endres, & Lanis, 2002; Deeter-Schmelz, Kennedy, & Ramsey, 2002; Holtham, Melville, & Sodhi, 2006). When assigned to teams and held collectively responsible for class-related projects,

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students often learn multiple skills valued by potential employers (Chen, Donohue, & Klimoski, 2004; O'Connor & Yballe, 2007). Effective teamwork in the classroom relates to a complex mix of high-quality interaction, effective listening and cross-fertilization of ideas, feelings of cohesion and belongingness, and a collective interest in placing the team's needs ahead of the individual—and is reflected in deep and comprehensive learning about complex content areas (e.g., Katzenbach & Smith, 1993; Larson & LaFasto, 1989). While scholars have advocated for the teaching of teamwork skills in business school classes (see Bolton, 1999; Deeter-Schmelz et al., 2002; Ettington & Camp, 2002; Holmer, 2001; McKendall, 2000; Page & Donelan, 2003), too many students teams are left on their own with little or no guidance from instructors (Vik, 2001).

While learning of course content is the most important outcome of classroom instruction, and considerable evidence of instruction-learning linkages has emerged (Koppenhaver & Shrader, 2003; Michaelsen, Fink, & Knight, 1997; Yazici, 2004), scholars note that inadequate or absent instruction about teamwork frustrates and disengages students, and spawns cynicism and wariness about working with others (Buckenmyer, 2000; Connerley & Mael, 2001; Holmer, 2001; O'Connor & Yballe, 2007; Vik, 2001). These outcomes are alarming because organizations value not just content area experts, but also people interested in and confident about collaborating and working effectively with others in team environments.

Jassawalla and Sashittal (1998, 1999) proposed a model showing that the process by which groups of people transform into a collaborative team is characterized by developmental milestones, each characterized by distinctive cognitive, emotional and behavioral learning. This article presents findings of a study that partially tested the model. In particular, the study examined the impact of a teaching strategy on at-stakeness and transparency, two initiating and successive milestones in the process by which teams become collaborative as proposed by the model, on student perceptions of: (a) their ability to collaborate with others and (b) their team's overall effectiveness.

The teaching strategy was implemented in 26 sections of undergraduate Organizational Behavior course taught over 6 years (787 students, 143 teams), and distributed across the span of a semester. The strategy focused on engaging students in a series of activities that aimed to produce behavioral changes associated with multiple stages of collaborative teamwork. We present evidence to suggest that these changes improve student perceptions of their learned ability to collaborate with others in a team environment (henceforth *collaboration-ability perception*) and perceptions of their team's effectiveness, and mediate the link between the strategy-prompted actions and student perceptions. We draw inspiration from Chen et al.'s (2004) work that examined the impact of a stand-alone course devoted to teamwork, and discuss the impact of a teaching strategy that is integrated with regular course content, and distributed across the span of the semester. We begin with a brief discussion of the background of the study, explain how we derived the teaching strategy, and describe the implementation process. Then we discuss guiding hypotheses and scales, delineate the scope of the study, and describe the method for data analysis. Finally, we discuss our findings and implications for future research.

## CONCEPTUAL FOUNDATIONS

### Background of the Study

One of the coauthors teaches multiple sections of the undergraduate course on Organizational Behavior offered in a business school at a state university located in the Northeastern United States. In these classes, students are randomly assigned to teams (5–6 students per team), and required to complete a team project on Organizational Behavior-related topics (e.g., leadership, power and politics, conflict management, organizational design, organizational culture, organizational change). Each team is required to: (a) conduct a literature review, develop a conceptual framework, identify hypotheses and research questions, and draw implications for real-life organizations, (b) compare and contrast their literature-derived view with the practices of real-life organizations based on interviews with managers, (c) make a formal presentation of their framework and learning from the real-life firms, and (d) submit a final paper for which they receive a collective grade. A teaching strategy for fostering teamwork is necessary because not all students are equally prepared or skilled for teamwork, and the absence of instruction and guidelines often contributes to a wide variance in team performance and learning.

### Literature on Teaching Strategy

There is an abundance of normative insights in the practitioner and scholarly press about what instructors *ought* to do to improve teamwork in classrooms (e.g., Gladstein, 1984; Hackman, 1987; Katzenbach & Smith, 1993; Larson & LaFasto, 1989). A search on ProQuest (ABI/INFORM Global) yields over 12,000 articles, including over 3,900 in scholarly journals; all of which hold implications for instructors interested in fostering teamwork. In a general way, these writings suggest that an effective teaching strategy should.

- Provide concrete guidelines to participants in the initiating stages of teamwork (e.g., Bolton, 1999; Page & Donelan, 2003). Instructor should serve as a coach (Bolton, 1999), and set the rules for providing feedback in teams (Holmer, 2001).
- Introduce students to multiple roles played by team members, and encourage students to identify the roles they would like to play (Page & Donelan, 2003). Agreement among team members about the roles they will play helps create positive interdependence (Page & Donelan, 2003).
- Include experiential learning (Bolton, 1999), and interactive processes that can yield increased trust (Buckenmyer, 2000; Thacker & Yost, 2002), open communication, and better resolution of conflicts (Holmer, 2001) to improve teamwork and reduce groupthink and social loafing.
- Provide instruction at the beginning of the semester to lay the necessary foundation. Team members should discuss their concerns about working in teams, and expectations of each other (O'Connor & Yballe, 2007; Willcoxson, 2006), define ground rules and project milestones (Stone & Bailey, 2007; Willcoxson, 2006).

- Encourage student teams to develop a “team charter” that reflects the collective definition of goals and ground rules for interaction (Bolton, 1999; Holmer, 2001; Page & Donelan, 2003).
- Ensure that the strategy allows for mid-semester correction and reflection on learning (Bolton, 1999; Page & Donelan, 2003; Tuckman, 1965). End-of-semester evaluations fail to produce an impact on student learning; instead, they encourage conflict avoidance and discourage honest feedback (Holmer, 2001; O'Connor & Yballe, 2007).

While a large number of normative insights exist, the content of an effective strategy can depend on the instructor's theoretical assumptions about the development of teams or groups (see Akrivou, Boyatzis, & McLeod, 2006; and Hackman & Wageman, 2005 for detailed reviews). For instance, the teaching strategy can differ based on the views that classroom teams require process consultation (e.g., Schein, 1988), or behavioral audits and guidelines (e.g., Schwarz, 1994), or behavioral modification via operant conditioning (e.g., Komaki, 1998; Komaki & Minnich, 2002), or help as they proceed through the developmental phases (e.g., Bennis & Shepard, 1956; Smith & Berg, 1987, 1995; Tuckman, 1965) or temporal phases (e.g., Gersick, 1988, 1989), or skill-specific coaching (e.g., Chen et al., 2004).

Aligned with our interest in testing the link between instruction and an improvement in student collaboration-ability perceptions, the teaching strategy we formulated was based on Jassawalla and Sashittal's (1998, 1999) model of collaborative teams. The model emerged from an exploratory study that examined the processes by which a group of technically qualified people transformed into highly collaborative teams, and identified at-stakeness and transparency as two initiating developmental milestones in this process. At-stakeness refers to the personal stake participants attributed to their involvement in the team. Team members attain high levels of at-stakeness when they commit highly and equally to the team's inputs and decisions, share equitably in the team's collective task, and function as an equal voting citizen in a team without significant social or political hierarchy (Jassawalla & Sashittal, 1998, 1999). At-stakeness is conceptually different from commitment, an often used word in management literature. While commitment refers to an individual's attribution of stake in a process and/or outcomes, at-stakeness refers additionally to the actions that reflect the individual's commitment and acknowledgment by others in the social environment, that such actions reflect a member's commitment. At-stakeness therefore is a validation by others based on one's actions, versus self-stated level of commitment.

Transparency, the subsequent stage in the developmental process, refers to the extent of shared knowledge among team members and the absence of hidden agendas. Team members have attained high levels of transparency when members freely share ideas and information, and are eager to learn about the concerns, motivations, and agendas of others—so that they operate from high levels of awareness about what others are thinking (Jassawalla & Sashittal, 1998, 1999).

There are important differences between the Jassawalla and Sashittal (1998, 1999) model of team transformation and the stage and phase models of group

development. Most stage and phase models are universal. Tuckman's (1965) stage model suggests that all teams go through mutative, evolutionary changes associated with forming, storming, norming, and performing. Similarly, Gersick's (1988) phase model suggests that changes in project teams occur as revolutionary discontinuities over time (see Arrow, Henry, Poole, Wheelan, & Moreland, 2005; Akrivou et al., 2006 for extensive review). The Jassawalla and Sashittal (1998, 1999) model is context specific; it proposes that the transformation into *collaborative* teams occurs as a result of the urgency of the context and strong intentionality because the process: (a) is observed in instances where the firm's survival hinges on the team's ability to develop new marketable products from new technologies faster and better than the competition and (b) results from strong intervention of carefully selected leaders who invite key people to participate based on their technical and interpersonal skills, and direct significant resources to their training and education. At-stakeness and transparency are not proposed as universal or evolutionary developmental stages; that is, they do not just *happen* in teams, they emerge as a result of strong intentionality and interventions. Attempts to produce collaborative behaviors in classroom teams based on this model call for clear objectives and a plan to convey the sense of purpose and urgency, and coaching and guidelines for interactions that are: (a) distributed across the span of the semester and (b) capable of producing the behavioral learning associated with each stage of the transformation process. In this regard, our study is more relevant to instructors who believe that students should leave classrooms with a greater degree of interest and confidence in working collaboratively with others in team environments, and are interested in playing an active role in producing such outcomes.

### **The Strategy Content and Implementation Process**

The teaching strategy is implemented in 1–3 sections of undergraduate Organizational Behavior every semester. It is derived from the literature and the instructors' experiences with managing teamwork in classrooms. It distributes instruction across the span of the semester, and directs students to engage in specific activities during the first, second, fifth, seventh, ninth, and tenth weeks of a 15-week semester, and is designed to help students reach high levels of at-stakeness and transparency. During the first week of classes, for instance, students are informed that they will be participating in a comprehensive team project. The importance of learning to function as a team in light of the growing number of workplace teams is discussed. The nature of the team assignment is also explained. Then students are assigned the following questions for home work:

- What are your biggest concerns (at least two) about working in teams?
- List at least two strengths and two weaknesses that you possess, that will serve the team. Include knowledge, experience, skills, personality, and unique abilities.
- How would your team function if everything went exactly as you hoped?

The assignment aims to encourage students to frame their answers based on their experiences in other classroom teams, away from peer pressure. The

**Exhibit 1:** Roles for team members.

Each team member is required to actively and enthusiastically play one of the following roles at every team meeting (on a rotational basis):

**Leader:** facilitates/motivates members towards mission and mediator achievement.

**Scribe:** writes key discussion points and minutes of the team meeting.

**Paraphraser:** facilitates communication, reflects back in own words on what was said.

**Reporter:** explains team's key discussion points to the rest of the class/professor.

**Reinforcer:** gives positive reinforcement to increase effective team/member behaviors.

**Critic:** provides critique to help the team/individual members increase effectiveness.

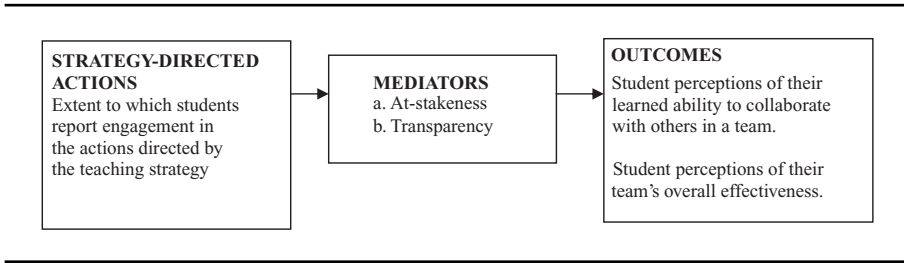
purpose of the home work assignment is to prepare students for defining ground rules for participation in their teams. While the Jassawalla and Sashittal (1998; 1999) model emerged from the contexts in which team leaders carefully selected participants for their discipline-specific knowledge and interpersonal skills, in the second week of classes, students are randomly assigned to teams and asked to discuss their answers to the home work assignment. The random assignment results from the infeasibility of identifying team leaders, and allowing them to select team members based on knowledge and skills in classrooms (as implicated by the Jassawalla & Sashittal model). The intent of the class discussions is to engage students in information sharing and set the stage for the emergence of at-stakeness and transparency. Based on implications drawn from the literature, the instructor then: (a) refers to the syllabus and provides a brief outline of teamwork-related activities in which students are required to engage during the semester, (b) provides a detailed explanation of the multiple roles that team members are required to play on a rotating basis during their meetings (see Exhibit 1 for details), and (c) assigns a research topic to each team, and explains the project-related expectations and deliverables. Immediately, following this instruction, the teams are required to: (a) develop a mission statement for the team, (b) decide who will play what role, and specify how the roles will be rotated for the next eight meetings, so that every member has the opportunity to practice playing each role at least once, (c) define key project milestones and deadlines for activities (i.e., activities related to a literature review, development of a framework, identification of research questions and/or hypotheses, developing implications, identify managers for interviews, etc.), and (d) develop ground rules for participation on the team, and define acceptable and unacceptable behaviors. The intent is to engage students in ways that discourage social loafing and groupthink, and increase at-stakeness and transparency. To ensure documentation of these activities, all teams receive a folder that contains forms for recording the team's mission statement, ground rules for participation, key milestones, and the roles that each individual will play in each meeting. Additionally, teams are required to document the agenda for their subsequent meeting, and submit the folders to the instructor at the end of the class.

In the fifth week of the semester, the classroom lecture and discussion is devoted to Group Dynamics, a chapter included in most standard Organizational Behavior texts. In addition to reviewing material from the text, students are introduced to some of the classical writings about effective teamwork (e.g., Hall, 1980), issues related to process losses, such as social loafing and groupthink (e.g., Comer, 1995; Janis, 1982), and to some of the new writings on the subject (e.g., Bailey, Sass, Swiercz, Seal, & Kayes, 2005; Campion, Papper, & Medsker, 1996). The topics include the multiple stages of group development (Tuckman, 1965), the value of constructive conflict, consensus building, and synergy (Hall, 1980).

In the seventh week of the semester, an experiential exercise titled “Trust me” is conducted in class. Each team member is blindfolded at a time, and others are required to guide the member through an obstacle course using only verbal instructions. After students take turns completing the obstacle course, they are asked to note their individual experiences, then convene in their teams and respond to the following questions: (a) How and why team effectiveness depends on trust built among team members? (b) What actions should team members take to build trust? The intent of this exercise is to raise awareness about trust and its importance in information sharing, developing creative ideas, and engaging in constructive conflict.

In the ninth week of the semester, based on the class discussions and assigned reading, students are required to submit a 7–10 page paper that includes: (a) their reflections on their team’s progress, (b) their evaluation of their team’s effectiveness (rated on a 1–10-point scale), (c) the defense of their evaluation based on relevant literature related to groupthink, social loafing, and team effectiveness, and (d) one-page feedback for each member of the team; students are required to include positive comments as well as constructive criticism. After the papers are graded, the students’ anonymous feedback is shared with other members of their team (i.e., in the 10th week of the semester, each student receives the anonymous feedback sheets written by their team mates). The reflective paper and feedback aims to accomplish three interrelated objectives. First, it provides an opportunity for mid-semester correction based on the feedback they receive from each other, and the multiple perspectives on their learning and accomplishment. Based on the feedback, teams are encouraged to modify their processes, interactions, and ground rules necessary for improving the team’s performance. Second, the feedback aims specifically to foster transparency, and encourage students to develop new ways of thinking and behaving in teams. Third, it aims to help students develop a clear frame of reference to evaluate the effectiveness of their team, and evaluate their learning about teamwork—both of which are dependent variables of our study. To summarize, the teaching strategy directs students to engage in the following actions:

- Discuss individual concerns related to teamwork at the first meeting.
- Develop ground rules for participation in the team.
- Develop a mission statement for the team.
- Identify key milestones for the team project.
- Share mid-term feedback with the team.

**Figure 1:** Conceptual model.

## CONCEPTUAL MODEL, HYPOTHESES, VARIABLES, AND SCALES

### Conceptual Model and Hypotheses

Figure 1 shows the conceptual model we tested, that is, the relationship between the student-reported extent of engagement in the actions directed by the teaching strategy (henceforth *strategy-directed actions*), reported level of at-stakeness and transparency achieved in the team, and collaboration-ability perceptions and perceptions of their team's effectiveness (i.e., the dependent variables).

The guiding hypotheses for the study were

- H1: At-stakeness mediates the link between strategy-direction actions and transparency.
- H2: Transparency mediates the link between at-stakeness and student perceptions of their learned ability to work collaboratively with others.
- H3: Transparency mediates the link between at-stakeness and student perceptions of their team's effectiveness.

The hypotheses of mediation were tested using the procedure outlined by Singh, Goolsby, and Rhoads (1994). A mediator (M) in the relationship between an antecedent (A) and the consequence (C) is significant if the following conditions are satisfied: (a) A is significantly related to C (established via a direct effects model), (b) A is significantly related to the M, (c) M is significantly related to C, (d) the direct effect relationship between A and C becomes insignificant when the mediator (M) is added to the model, and (d) the mediation effect model explains greater variance in C, than explained by the direct effects model (see Singh et al., 1994). Hence, we first tested the hypothesized direct effects models. Then, we simultaneously analyzed the relationships among the antecedents and consequences, the antecedent and the mediator, and the mediator and the consequence (i.e., the partial mediation models).

### Dependent Variables

We focused on collaboration-ability perceptions, which are conceptually separate from actual ability to function collaboratively with others, or from outcomes assessed by direct measures of outputs, improved capacity, and positive affect. While the dependent variables are aligned with our pedagogical interests in improving



enthusiasm for and building confidence about working collaboratively with others, it is a major limitation of our study because student perceptions can be positive even when the actual quality of teamwork lags. Moreover, it is possible for: (a) a team to produce an excellent final paper and make a brilliant presentation when the perceived level of at-stakeness and transparency is low; particularly in the instances where the paper and presentation reflect the work of a smaller subset of an otherwise contentious, disinterested, opaque team with unequal stake in the outcomes or (b) participants to attribute high levels of at-stakeness and transparency to their team even when their own learning, paper, and presentation are substandard; particularly when hyper-bonding among residential, traditional-age students leads to overestimation of their learning and team's effectiveness. In other words, the weakness of the study relates to the absence of direct measures of team performance and behavioral change.

However, our focus on student perceptions can be defended as follows. First, building confidence in their ability to work collaboratively with others in a team environment, and shaping perceptions that they functioned in effective teams, is an important part of learning in classroom teams (see Dhiman, 2008), and important for functioning effectively in organizations (Morris, Urbanski, & Fuller, 2005). Second, our focus on student perceptions as a dependent variable is aligned with the purpose of our study; that is, stimulate thinking about stake building and transparency, trigger new insights about collaborative teamwork, and instill curiosity and enthusiasm for working in organizational teams—outcomes that may endure long after the content of the assignment is forgotten. While not indicative of actual learning, this purpose is important because student cynicism and disengagement in team-based learning is cited as a source of concern (e.g., Buckenmyer, 2000; Connerley & Mael, 2001; Holmer, 2001; O'Connor & Yballe, 2007; Vik, 2001). Third, while student learning is clearly a matter of great concern to instructors, student perceptions matter strongly to business school instructors as well. The widely used end-of-semester faculty evaluations, essentially an assessment of student perceptions, factor strongly into the way faculty are evaluated and rewarded. Student perceptions and the resulting word of mouth often influences the formal and informal evaluation made by senior faculty and administrators. Student perceptions and the resulting reputation often determines enrollment in the sections offered by instructors. Student perceptions also strongly inform the process by which faculty members improvise their course and adapt to the learning styles of students. Collaboration-ability perceptions and perceptions of their team's effectiveness therefore represent worthy dependent variables, and are not intended to serve as surrogates for direct measures of actual learning and team effectiveness.

## **Scales**

The key items assessed, based on self-reports, were: (a) extent to which the effectiveness of the team was attributed to the strategy-directed actions, (b) the extent of at-stakeness, (c) the extent of transparency, (d) collaboration-ability perceptions, and (e) perceptions of overall team effectiveness. The scales were directly derived from: (a) the actions that the teaching strategy required students to take (please see direct concordance between the strategy-prompted actions and items on the

scale), (b) the definition of at-stakeness and transparency, and (c) key team-related learning outcomes as indicated by the literature. Aligned with its definition, at-stakeness was assessed by a three-item Likert scale and assessed the extent to which participants agreed that: (a) they had equal input into the team's decisions, (b) others participated equally, and (c) others were equally committed to the team. Similarly, aligned with its definition, transparency was assessed by a three-item Likert scale and assessed the extent to which participants agreed that: (a) the team shared information without harboring hidden agendas, (b) members were considerate toward each other, and (c) members freely expressed constructive conflict. Collaboration-ability perceptions were assessed by a nine-item Likert; with items devoted to communication barriers, scheduling, groupthink, consensus, creativity, trust, involvement, conflict, and leadership. Finally, a five-point rating scale was used to assess the participant's perception of the team's overall effectiveness (see Table 1 for scale items and internal consistency scores).

All scales we use in the questionnaire are new, and developed using multi-stage approach that is consistent with Churchill (1979) and Gerbing and Anderson (1988). The case for face validity is made by the use of five-point Likert scales for all questions. The case for content validity of scales used for: (a) strategy-directed actions and collaboration-ability perceptions rest in the literature review and guidelines about teaching strategies and (b) at-stakeness and transparency rest in the exploratory work of Jassawalla and Sashittal (1998; 1999). The psychometric properties of the measurement scales reported in this study were assessed in accordance with accepted practices; all scales achieve an acceptable coefficient alpha of at least .7. (Gerbing and Anderson, 1988; Nunnally, 1978).

## **METHODOLOGY**

Data were collected from 26 sections of Organizational Behavior courses taught by a coauthor in which the teaching strategy is administered ( $n = 787$ , teams = 143). The course is part of the core curriculum in an Association to Advance Collegiate Schools of Business International-accredited business school in a regional state university (approximate enrollment of the University is 5,000 students, and approximate enrollment in the business school is 600 students). All participants in the study are traditional age (19–23 years), full time residential students, nearly all in their junior year. The paper-pencil questionnaire is administered on the last day of classes. No extra points are awarded for participation, and no student has declined to participate in the study; that is, the response rate is 100%.

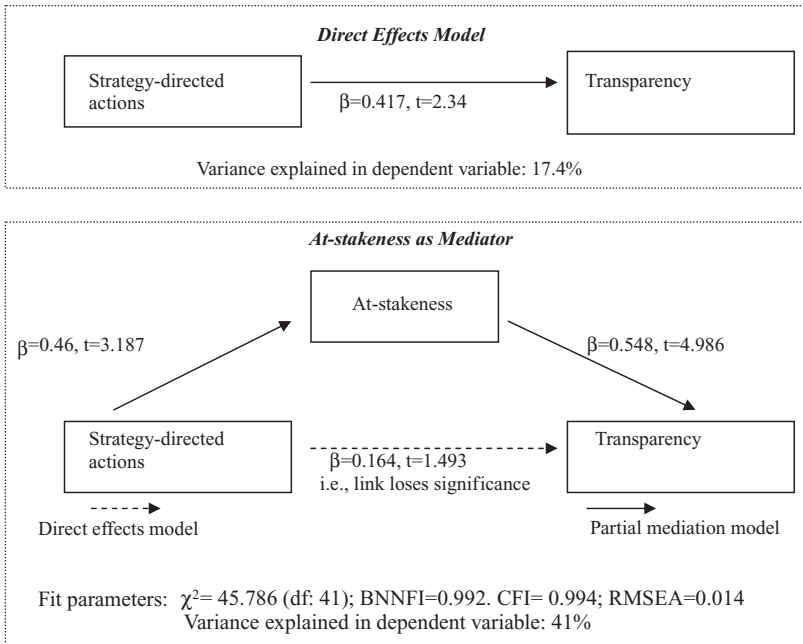
We employed the elliptically reweighted least square (ERLS) method offered by EQS software. The ERLS method assumes a multivariate elliptical distribution that is a more generalized form of the multivariate normal distribution assumed by the commonly used maximum likelihood (ML) method (Tippins & Sohi, 2003). Furthermore, it has been noted that the performance of ERLS is equivalent to that of ML for normal data and superior to that of other estimation techniques for nonnormal data (e.g., Sharma, Durvasula, & Dillon, 1989). In all our models, we analyzed the structural and measurement models simultaneously to provide a rigorous estimation. To assess validity of scales, we used EQS to conduct confirmatory factor analysis. We utilized the elliptical solution (ERLS) to enhance the

**Table 1:** Scale items and Cronbach’s alphas.

| # | Scale Name and Items<br>(All Scales are Five-Point Likerts)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Cronbach’s Alpha |
|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| 1 | <p><i>STRATEGY-DIRECTED ACTION</i><br/> <i>Question: Our team was effective because . . .</i><br/>                     We discussed individual concerns at the first team meeting.<br/>                     We identified the ground rules for all team meetings.<br/>                     We developed the team’s mission statement.<br/>                     We identified the key mediators for our team project.<br/>                     We gave mid-term feedback to each other.</p>                                                                                                                                                                                                                                                                                            | .770             |
| 2 | <p><i>The extent to which the strategy-directed actions resulted in AT-STAKENESS:</i><br/>                     I had as much input in team decisions as anyone else.<br/>                     All members participated equally.<br/>                     All members were equally committed to the purpose of the team.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                           | .737             |
| 3 | <p><i>The extent to which the strategy-directed actions resulted in TRANSPARENCY:</i><br/>                     We shared information freely, there were no hidden agendas.<br/>                     Members were very considerate toward each other.<br/>                     Members freely expressed constructive conflict.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                     | .718             |
| 4 | <p><i>Perceptions of learned ability to collaborate with others in team environments (collaboration-ability perceptions):</i><br/> <i>As a result of the teambuilding knowledge and skills I developed in class, I feel as if I am better able to:</i><br/>                     Avoid/overcome communication barriers.<br/>                     Avoid/overcome scheduling conflicts.<br/>                     Avoid/overcome groupthink.<br/>                     Reach consensus on key decisions.<br/>                     Achieve high levels of creativity.<br/>                     Develop trust in teams.<br/>                     Gain the involvement of all team members.<br/>                     Utilize constructive conflict.<br/>                     Lead a team.</p> | .751             |
| 5 | <p><i>How would you rate your team’s overall effectiveness?</i><br/>                     (Five-point itemized-rating scale ranging from 1 = <i>highly ineffective</i> to 5 = <i>highly effective</i>)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | NA               |

ability to estimate the model even if the data were nonnormal (Bentler, 2004). Convergent validity was established when all scale items loaded significantly on their hypothesized construct factors. Furthermore, we used a two-step nested-model approach to test the discriminant validity of our scales (e.g., Gerbing & Anderson, 1988). In the first step, the measurement items were allowed to load on their theorized factor (or construct), while the factors were allowed to covary. In the second step, the covariance between the two factors was set to one. Discriminant validity was established by assessing the difference between the  $\chi^2$  of the free covariance model and that of the constrained model. A significant  $\Delta\chi^2$  indicated discriminant validity. We compared all construct pairs using the above two-step process and the discriminant validity of each construct was established.

**Exhibit 2:** Competing model analysis: At-stakeness as mediator.



**FINDINGS**

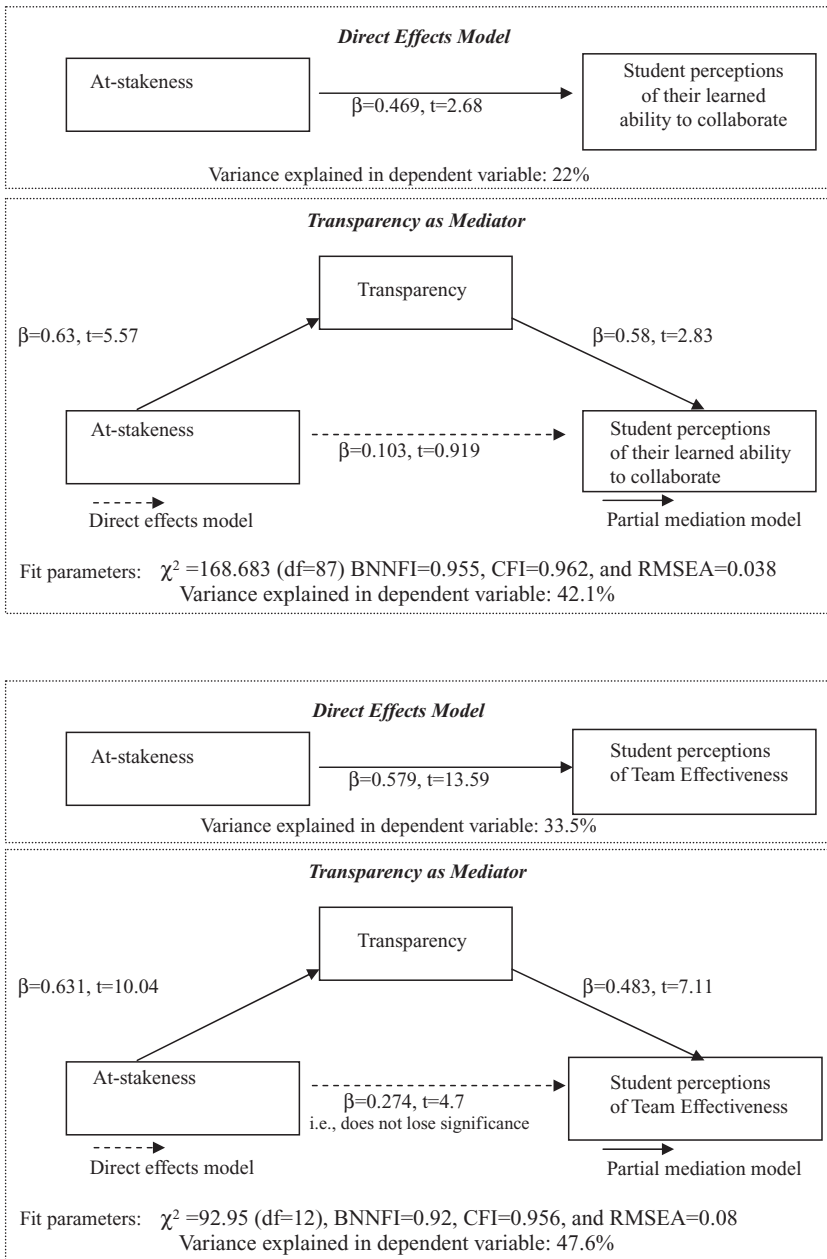
**At-Stakeness as Mediator**

Hypotheses 1 relates to the mediating role of at-stakeness in the link between strategy-directed actions and transparency. This hypothesis is validated by the following (see Exhibit 2 for details on fit indices and parameters). First, we find a significant linkage between strategy-prompted actions and transparency. Second, when at-stakeness is added to the model: (a) relationship between strategy-directed actions and at-stakeness emerges as significant, (b) the relationship between at-stakeness and transparency emerges as significant, and (c) the relationship between strategy-directed actions and transparency *loses* significance (see dotted line in the figure included in Exhibit 2). Further validating the test of mediation, the partial mediation model explains more of the variation in transparency than the direct effect model, that is, the explained variance increases from 17.4% to 41%. We therefore conclude that at-stakeness mediates the link between strategy-directed actions and transparency.

**Transparency as Mediator**

Hypothesis 2 relates to the mediating role of transparency in the link between at-stakeness and collaboration-ability perceptions. This hypothesis is validated by the following (see Exhibit 3). First, we find a significant linkage between transparency and collaboration-ability perceptions. Second, when we add transparency

**Exhibit 3:** Competing model analysis: Transparency as mediator. Student perceptions of their team’s overall effectiveness.



to the model: (a) the relationship between at-stakeness and transparency emerges as significant, (b) the relationship between transparency and collaboration-ability perceptions emerges as significant, and (c) the relationship between at-stakeness and collaboration-ability perceptions loses significance. The partial mediation model

also explains more of the variation in collaboration-ability perceptions than the direct effect model, that is, the explained variance increases from 22% to 42.1%. We therefore conclude that transparency mediates the link between at-stakeness and collaboration-ability perceptions.

Hypothesis 3 relates to the mediating role of transparency in the link between at-stakeness and student perceptions of their team's overall effectiveness. This hypothesis is partially validated by the following (see Exhibit 3). First, the link between at-stakeness and student perceptions of team effectiveness is significant. Second, when we add transparency to the model: (a) the relationship between at-stakeness and transparency emerges as significant (b), the relationship between transparency and perceived team effectiveness emerges as significant, and (c), even though the percentage of variance explained in the dependent variable increases from 33.5% to 47.6%, the link between at-stakeness and perceived effectiveness does not lose significance. Hence, this hypothesis is only partially supported. We next discuss the implications of the evidence of mediation, and the asymmetric impact of transparency (i.e., the evidence that it mediates the link between at-stakeness and collaboration-ability perceptions, but does not completely mediate the link between at-stakeness and student perceptions of team effectiveness).

## **IMPLICATIONS FOR INSTRUCTORS AND FUTURE RESEARCH**

### **Issues of Distributed Instruction**

Instructors interested in improving students' collaboration-ability perceptions might benefit from the evidence to suggest that a teaching strategy integrated with the course content, and distributed across the span of the semester produce at-stakeness and transparency—two initiating milestones in the process by which teams become collaborative. As the competing model analyses and the evidence of mediation suggest, when improvements in collaboration-ability perceptions is the desired outcome, the initiating elements of the teaching strategy are important for fostering behaviors associated with at-stakeness—that is, the first mediators in the developmental process. Learning the behaviors associated with at-stakeness requires students to engage in a set of activities by which they become committed to the common intents of the team, make their commitment explicit to others, and hold each other accountable for their own behaviors based on predefined rules of engagement.

We infer that students' perceptions of at-stakeness improve when the teaching strategy directs them to develop a mission statement, define ground rules for participation (and consequences for not following them), identify project milestones and set deadlines for activities, and assign roles to team members. Formal engagement in these activities appears to create a social environment in which students become clear that there are rules of participation, a predefined level of performance is expected, and they are accountable to each other, and deviating from collectively sanctioned norms produces negative consequences. It sets the ground work necessary for participants to take their work seriously, commit to the team's collective intent, take deliberate action to fulfill their commitment, and hold each other accountable.

The development of behaviors associated with transparency, the next stage in the development process, is provided not by the initial instruction—but by the achieved at-stakeness. This is because the emergence of at-stakeness seems to render the link between strategy-prompted actions and transparency insignificant. Furthermore, the mediation model shows that upon the emergence of transparency, the link between at-stakeness and collaboration-ability perceptions is rendered insignificant; that is, transparency and not at-stakeness accelerates the momentum toward improved collaboration-ability perceptions. This reaffirms the notion that once at-stakeness has emerged, meaningful change in student perceptions does not occur unless fresh instruction is provided to foster the emergence of transparency, and makes the case for distributed instruction. Progress toward collaboration may not *just happen* as part of the natural evolution of the team; it requires active intervention of instructors. In other words, once at-stakeness has emerged, it seems important to engage students in new activities associated with the emergence of transparency, that is, require them to reflect on the progress made by the team with respect to the collective agreements made about ground rules and mediators, and the contributions made by each team member, provide written feedback to each team member based on these reflections—and receive similar feedback from every other team member. The feedback essentially informs all participants about what others are thinking, so that they can shape their behaviors accordingly. These findings reinforce previous studies that found distributed learning increased retention among students (Barrick & Phelps, 1987) and improved learning from training initiatives in the workplace (Sikora & Shaw, 1996).

### **Exploring the Tacit Knowledge-Doing Linkage in Student Learning**

The partial support of the impact of transparency holds important implications. Instructors might find it useful to consider that there is a significant difference between what students say they have learned about working collaboratively with others, and what they can do as part of the team. In so doing, the findings raise questions about assessment of teaching strategies; that is, whether they produce cognitive changes only, or changes that translate into informed action within teams. We draw this implication from the asymmetric mediation by transparency; that is, while it mediates the link between at-stakeness and collaboration-ability perceptions, it does not mediate the link between at-stakeness and their perceptions of team effectiveness. This finding points to the need for new thinking about teaching strategies to bridge the troubling gap we identify between what students say about working collaboratively with others, and what they believe their team can do. In other words, when team members keep their word, stick to the ground rules, and effectively reach the collectively agreed mediators, they begin to trust each other, and no longer require formal affirmation from others about their stake in the team's collective intents. Hence, in terms of improving collaboration-ability perceptions, the role of at-stakeness becomes insignificant once transparency emerges. This, however, is not the case when the desired outcome is improvements in perceptions of their team's effectiveness. The mediation model suggests that while the emergence of transparency diminishes the strength of association between at-stakeness and perceptions of team effectiveness, the relationship does not become

insignificant. While new research is clearly needed to fully explain this asymmetry, we infer that transparency-related tacit learning is failing to embed sufficiently in the team's processes, and failing to produce sufficient improvements in their team's effectiveness. If the students say they learn, but also say that their teamwork has not become more effective, it raises troubling questions about their collaboration-ability to function effectively in organizational teams, where effective teamwork and not tacit knowledge is at premium.

## **CONCLUSIONS, LIMITATIONS, AND CAVEATS**

For instructors interested in shaping students' collaboration-ability perceptions, our study argues in favor of integrating teamwork-related instruction with the course content, and distributing it across the span of the semester to coincide with successive stages of cognitive and emotional development of participants, and incorporating measures to assess whether participants' cognitive and emotional learning about teamwork translates into team actions. For scholars, our study provides strong evidence that the path by which a group of students transforms into a collaborative team is characterized by distinct cognitive, emotional and behavioral milestones, and provides partial support for the Jassawalla and Sashittal (1998, 1999) model.

There are multiple limitations of our study that temper its scope, and several caveats that deserve iteration. Our reliance on self-reports represents a clear weakness of the study; additional thinking is needed for developing objective, independent assessment of at-stakeness and transparency. Similarly, direct measures of student learning and team effectiveness can be used in future studies. We could have surveyed more students, implemented the strategy in other classes in other schools and universities, or taken a more heterogeneous sample (i.e., students other than traditional age undergraduates), and conducted a time-series analysis, or implemented an experimental design. We could have also included demographic and lifestyle-related variables to examine their impact on student learning, and whether they mitigated or aided the developmental process. Finally, there is a caveat for instructors interested in implementing the teaching strategy we developed in classes. Our strategy aims to help students build a stake in their teams, and develop transparency among team members. In so doing, however, it creates a highly structured environment rich with instruction. There is always the danger that it can, even if among a small subset of students, produce dependency. While working in organizational teams, students may come to expect fresh instructions and structure to smooth them through the normal sociopolitical tensions that ordinarily characterize teams.

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