

Interpersonal Trust and Organizational Learning Capability

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Abstract

This exploratory study of 147 managers examines the relationship between interpersonal trust at the organizational, managerial and coworker level and organizational learning capability; the extent to which the dimensions of trust at these three levels relate to the generation and generalization of learning and/or various learning disabilities. Here, interpersonal trust was defined as “a belief in the trustworthiness of the other person(s); a belief in the willingness and ability of the other person(s) to advance the common good, leading to trusting behaviors that imply a reliance on, or confidence in some process or person(s).” Results provided support for the role of interpersonal trust in organizational learning capability. While several dimensions of organizational, managerial and lateral (coworker) trust were associated with learning or failure to learn, organizational trust contributed far more than managerial or coworker trust to organizational learning capability. The implications of these results are discussed.

Keywords: interpersonal trust; organizational learning capability; learning disabilities.

Suggested track: Micro, meso and macro institutional factors affecting knowledge and learning

Introduction

With change as the only constant in today's global economy, organizations need to build learning capability - 'adaptive learning' as well as 'generative learning', to enhance the ability of employees at all levels to learn faster than competitors from their own successes and failures as well as that of others; to expand their capacity to create the results they desire, and to nurture new and expansive patterns of thought (Senge, 1990). Continually learning from the environment, generating and generalizing new knowledge will ensure the organization's survival. Organizations that can make full use of their collective expertise and knowledge are likely to be more innovative, efficient, and effective. (Argote 1999; Wernerfelt 1984). Knowledge acquisition, utilization and dissemination in turn depend on interpersonal trust.

Interpersonal trust and organizational learning capability:

Interpersonal trust is a complex construct with different bases and determinants, which operate at multiple levels in the organization to facilitate knowledge exchange. Mayer, Davis and Schoorman (1995, p. 712) define trust as "the willingness of a party to be vulnerable", which in turn depends on perceived trustworthiness—that quality of the trusted party that makes the trustor willing to be vulnerable. It is an expectation that alleviates the fear that another partner will act opportunistically (Bradach & Eccles 1989) and that tasks will be accomplished reliably (Sitkin & Roth 1993).

An employee will be better able to acquire and share informal knowledge if s/he does not anticipate harmful consequences from that action. When trust is absent, relationships are characterized by an adversarial attitude: me vs. you; us vs. them; by deep and hidden animosities rather than goodwill. Respect is lost and performance is compromised with energies going into manipulation and protection rather than efficiency and effectiveness. Thus, interpersonal trust is essential to organizational learning capability, knowledge acquisition and dissemination, the generation and generalization of ideas.

The trust literature (Dirks & Ferrin 2001; Mayer et al. 1995) provides considerable evidence that trusting relationships lead to greater knowledge exchange. When trust exists, people are more willing to give useful knowledge (Andrews & Delahay, 2000; Penley & Hawkins, 1985; Tsai & Ghoshal, 1998; Zand, 1972) and are also more willing to listen to and absorb others' knowledge (Carley 1991; Mayer et al. 1995). By reducing conflicts and the need to verify information, trust also makes knowledge transfer less

costly (Currall & Judge 1995, Zaheer, McEvily & Perrone, 1998). These effects have been found at the individual and organizational levels of analysis in a variety of settings.

Organizational learning capability is "the capacity to generate and generalize ideas with impact across multiple organizational boundaries, through specific management initiatives and practices" (Yeung, Ulrich, Nason & Von Glinow, 1999, p. 11). According to Yeung et al. (1999, p. vi) organizational learning capability = generating ideas x generalizing ideas with impact. It is a multiplicative rather than an additive function and provides a much more accurate view of an organization's learning environment. In the organizational context, "learning" means that knowledge has been transferred beyond individual learners to other people, units, and functions (*ibid.* p. 11). Thus, there are three key considerations in organizational learning (i) the generation of ideas, (ii) the generalization of these ideas and (iii) the identification of learning disabilities, that is, barriers to generation and generalization. There are six dimensions of learning, namely, (i) where the learning occurs (within/across boundaries), (ii) who does the learning (individuals/teams), (iii) when the learning occurs (towards mastery/ongoing), (iv) what the learning focuses on (improving existing process/inventing new processes), (v) how the organization learns (learning styles) and (vi) why the organization learns (strategic/operational) (*ibid.* pp.185-186).

The generation of ideas "refers to the organization's ability to bring into existence ideas via different learning styles, that is, through acquiring, discovering, inventing, and sourcing ideas" (*ibid.* p.12). In their typology of four basic learning styles, Yeung et al. (1999) incorporate the two dimensions of learning: from direct experience versus the experience of others and learning by exploration (experimentation with new competencies, technologies, and paradigms) versus exploitation (the refinement and extension of existing competencies, technologies, and paradigms). That is, managers generate ideas in four basic ways; namely, *experimentation* - by trying many new products and processes (direct experience and exploration); *continuous improvement*, in which they learn "by constantly improving what they have done before and mastering each step in a process" (p. 38) before moving on to other processes (direct experience and exploitation); *knowledge acquisition*, in which they learn by encouraging individuals and teams to acquire new knowledge continuously (learning from the experience of others and exploration); and *benchmarking*, in which they learn by studying how other groups do things and trying to adapt their techniques (learning from the experience of others and exploitation of that knowledge).

The generalization of ideas involves the ability to move ideas and share ideas “across boundaries within an organization. Learning cannot occur unless ideas are transferred over time, physical space, and /or the organizational hierarchy” *ibid.* p,12).

Learning disabilities refer to organizational barriers in the generation and generalization of ideas. *Failures in generation* include, (i) *Blindness*: the difficulties in the identification and perception of performance gaps between the actual and desired states of the organization; “an inability to accurately identify potential problems or opportunities in the organization's environment through poor scanning processes”. (ii) *Simplemindedness*: the failure of the organization to “use elaborate and sophisticated analytical procedures, routines, and programs” for the analysis of threats and opportunities and for the invention of solutions to address them; a failure “to consider the organization as a complex system with multiple feedback loops,” consequently overemphasizing one cause among many; the application of “simple heuristics to complex situations without careful analysis” (*ibid.* p. 50). (iii) *Homogeneity*: the failure to address the complex issues facing businesses in today's dynamic environment from different sources and perspectives; a restriction in the variety of information and perspectives available to the organization. Whereas “simplemindedness concerns the quality of the analysis, homogeneity indicates the quantity of information present” (iv) *Tight coupling*: the tight control to which different departments and subunits are subjected such that there is “little difference between policies and procedures in the various units. Rigid hierarchical structures, highly centralized decision-making, and highly formalized rules and procedures all cause tight coupling” (*ibid.* p. 51). Such tightly coupled organizations are extremely inflexible and unadaptive. They present a uniform analysis and response to complex situations (Weick, 1979). In contrast, loosely coupled organizations allow departments and subunits some autonomy to deal with their own unique circumstances but maintain a degree of oversight and compatibility with the whole.

Failures in generalization include (i) *Paralysis*: “an inability of the organization, for whatever reason, to take action or implement new procedures. It occurs when an organization holds on to “tried and proven ways of doing things” long after their “usefulness has expired” - “the rule of repeated action” (Hornstein, 1986). (ii) *Superstitious learning*: “the inability to interpret accurately the meaning of experience”, stemming from the use of “limited data, fabricated meanings, or irrational mythologies” (Yeung et al. 1999, p.52), with wrong ideas being generalized. (iii) *Diffusion deficiency*: the inability to disseminate information either “through the communication system,

computer network, training, socialization, or cross-functional teams” to all relevant areas of the organization. This develops when learning occurs in an individual or unit of the organization but is never spread to other portions of the organization. “Political fiefdoms, power dynamics, and rigid pyramidal organization structures can restrict the diffusion of ideas and procedures across the organization” (*ibid.* p. 53).

The present study explored the relationship between trust at the organizational, managerial and coworker level and organizational learning capability, by examining the extent to which the dimensions of trust at these three levels relate to the generation and generalization of learning and failures to do so. Here, *interpersonal trust* was defined as “a belief in the trustworthiness of the other person(s); a belief in the willingness and ability of the other person(s) to advance the common good, leading to trusting behaviors that imply a reliance on, or confidence in some process or person(s).”

Organizational trust and organizational learning capability

Organizations need a framework around which everything else is constructed and top management plays a key role in providing that framework - the core values that underlie norms, policies, decisions, behavior within the organization. Each member of an organization constructs his or her representation or image of the theory-in-use of the whole and individuals jointly construct shared descriptions of the organization, which guide inquiry and define the context within which organizational learning occurs. Does the organization value the suggestions of individuals, encourage them, enhance them, combine them to create new ideas, store them, promote them, generalize them, adopt them?

A system that is rigid and bureaucratic, and is based on the assumption that people will abuse power if entrusted with it, is inimical to interpersonal trust. That which triggers defensive action is inhibitory to learning, it moves us away from the truth about ourselves, and thwarts our potential for growth and learning. On the other hand, an environment that is conducive to the detection and correction of error, as also the acquisition and dissemination of knowledge will enable informed decisions in rapidly changing and uncertain contexts. The system must allow for corrective action that not only makes existing techniques more efficient and effective; looks for other strategies within the existing framework (single loop, incremental, adaptive, exploitive change) but also for corrective action that questions that very framework - those strategies and operating mechanisms that are often taken for granted (double loop, generative,

transformational, exploratory change) (Argyris & Schön, 1978; March & Simon, 1958; Senge, 1990). When individuals within an organization experience a problematic situation they must inquire into it on the organization's behalf. Learning that results from individual inquiry "must become embedded in the images of the organization held in the minds of its members and/or in the epistemological artifacts (the maps, memories, and programs) embedded in the organizational environment." (Argyris & Schön, 1978, p.16). Insights must be conceptualized so that they become public knowledge, 'open to challenge and further improvement' (Senge, 1990, p. 356). Storing the new beliefs, knowledge, or patterns for action, or adopting new "routines" (policies and procedures), and disseminating it as valid and valued knowledge is in turn is easier when there are common goals, shared control, open communication, inclusion in decision making, participation in the design and implementation of action, sharing of critical information, feelings and perceptions, surfacing of conflicting views, reporting of problems and mutual influence; interpersonal trust as the 'theory-in-use' (Argyris, 1993).

Nevis, DiBella and Gould (1995) in their discussion of the structure and processes that affect the ease or difficulty of learning and the amount of effective learning that takes place consider the identification of performance gaps, a concern for measurement, an experimental mindset and a climate of openness as a few of the facilitating factors for organizations as learning systems.

In accordance with this and the definition of interpersonal trust proposed earlier, *organizational trust* was defined here, as the core values of top-level management not merely 'espoused' but 'theory in use' that largely determined how "things get done around here". The core values included (i) *Openness*: the spontaneous expression of feelings and thoughts, and sharing of these without defensiveness. (ii) *Confrontation*: facing and not shying away from problems; deeper analysis of interpersonal problems; taking up challenges. (iii) *Trust*: maintaining the confidentiality of information shared by the other person and not misusing it; a sense of assurance that others will help when needed and will honour mutual obligations and commitments. (iv) *Authenticity*: the congruence between what one feels, says and does; owning ones actions and mistakes, unreserved sharing of feelings. (v) *Proaction*: initiative; preplanning and preventive action; calculating payoffs before taking action. (vi) *Autonomy*: the freedom to plan and act in one's own sphere; respecting and encouraging individual and role autonomy. (vii) *Collaboration*: giving help to, and asking help from others; team spirit, working together (individuals and groups) to solve problems. (viii) *Experimenting*: using and encouraging innovative approaches to solve problems; using feedback for

improvement; taking a fresh look at things encouraging creativity (Pareek, 1992, p. 4-5).

Trust based managerial practices and organizational learning capability

Senge (1990) argues that learning organizations require a new view of leadership. In a learning organization, leaders are responsible for learning, for *building organizations* where people continually expand their capabilities to understand complexity, clarify vision, and improve shared mental models. Learning organizations will remain a 'good idea'... until people take a stand for building such organizations. Taking this stand is the first leadership act, the start of *inspiring* (literally 'to breathe life into') the vision of the learning organization (Senge 1990, p. 340).

Building a shared vision is crucial early on as it 'fosters a long-term orientation and an imperative for learning' (*ibid.* p. 344). The leaders' task primarily requires designing the learning processes whereby people throughout the organization can deal productively with the critical issues they face, and develop their mastery in the learning disciplines' (*ibid.* p. 345). Another task is relating *the story*: 'the overarching explanation of why they do what they do, how their organization needs to evolve, and how that evolution is part of something larger' (Senge 1990, p. 346). Seeing 'the big picture' and appreciating the structural forces that condition behavior, leaders can cultivate an understanding of what the organization (and its members) are seeking to become. When there is genuine vision (as opposed to the all-to-familiar 'vision statement') people excel and learn, not because they are told to, but because they want to (Senge, 1990, p.9).

In addition, leaders need to continually reinforce, refine and enhance new capabilities, for which they need to support reflection, the practice and dissemination of ideas and experience; allow the team to experiment with new processes and materials and capture their learning for others. Hence, managers who inspire a shared vision, challenge the process, model the way, encourage the heart and enable others to act will facilitate the ability to 'reflect-in-and-on-action' which would further action learning or meaningful learning on the job. Nevis, DiBella and Gould (1995) identify involved leadership and multiple advocates as facilitating factors in their model of organizations as learning systems.

In this study, *Managerial trust* was based on Kouzes and Posner (1987) and reflected the manager's belief in the willingness and ability of the subordinates to advance the

common good. The dimensions included (i) *Challenging the process*: (a) searching out challenging opportunities to change, grow, innovate, and improve; (b) experimenting and taking risks and learning from the accompanying mistakes. (ii) *Inspiring a shared vision*: (a) envisioning an uplifting and ennobling future; (b) enlisting the support of others in a common vision by appealing to their values, interests, hopes, and dreams. (iii) *Enabling others to act*: (a) fostering collaboration by promoting cooperative goals and building trust; (b) strengthening others by sharing information and power and increasing their discretion and visibility. (iv) *Modeling the way*: (a) setting an example for others by behaving in ways that are consistent with stated values; (b) planning small wins that promote consistent progress and build commitment. (v) *Encouraging the heart*: (a) recognizing individual contributions to the success of every project; (b) celebrating team accomplishments regularly.

Coworker trust and organizational learning capability

In the organizational context the only learning that matters is in groups because the results produced by any organization are produced collectively. The knowledge of an organization is in its social networks - in the networks of relationships. If people do not trust each other and cannot turn to somebody for help, there is less knowledge. If people cannot talk openly about a difficulty, there is less capacity to learn. Knowledge is a social phenomenon. We generate and live our knowledge in networks of personal relationships. Research has shown that people prefer to turn to other people rather than impersonal sources for information. Engineers and scientists were roughly five times more likely to turn to a person for information than to an impersonal source such as a database or file cabinet (Allen, 1977).

Effective knowledge creation and sharing in turn depends on interpersonal trust, trust in a coworker's competence and benevolence (Abrams, Dross, Lesser, & Levin, 2003). Seeking information amounts to admitting a personal lack of knowledge; making oneself vulnerable to the benevolence of the knowledge source (Lee, 1997), e.g., in terms of their reputation (Burt & Knez, 1996). Further, trust of the knowledge source decreases defensive behaviors that have been shown to block learning for both individuals and groups (Argyris 1982; Edmondson 1999).

Coworker trust in this study was defined as the trusting attitudes and trustworthy behaviors displayed among coworkers namely, (i) *Openness*: sharing one's innermost thoughts and feelings with others and being receptive to data, ideas, perceptions, and feelings. (ii) *Supportiveness*: being encouraging, reassuring, and understanding of

others, their agendas, and their goals rather than one who tries to bind others to his or her desires and wishes, operating on the assumption that others are inadequate and need to be dominated by someone who "has it together." (iii) *Willingness to risk*: entrusting one's well-being to another person, making oneself vulnerable rather than plying it safe. (iv) *Respect*: acknowledging people for who they are and for what they have to contribute. (v) *Genuineness*: being a person of integrity whose thoughts, feelings, and actions are consistent. (vi) *Cooperativeness*: an attitude wherein an individual works toward mutually desired shared goals, sharing relevant information openly, clearly, and honestly. (vii) *Mutual*: considering others as equals. (viii) *A Problem-centered attitude*: working collaboratively to define problems, explore alternatives, and arrive at solutions; encouraging others to set goals, make decisions, and evaluate progress in the light of the nature of the problem and the various alternatives open to them rather than being solution-minded. (ix) *Acceptance and Warmth*: a belief that no matter what they share, others will respond in an accepting, nonjudgmental manner. (x) *Dependable*: a belief that others can be relied on, that one can predict how others will respond, whether the situation is simple or complex. (xi) *Expert*: seeing oneself and others as knowledgeable and experienced in the area in which trust is to be granted; as possessing and exercising "relevant wisdom." When people are inept with respect to the substantive knowledge, interpersonal qualities, skills, and abilities needed to work collaboratively, they often blame others for their ineffectiveness. Lack of expert technical and relational competencies, results in poor communication dynamics and a hostile, defensive environment. (xii) *Accountable*: an individual's belief that others would meet deadlines and performance standards; that they hold themselves responsible for their work (Chartier, 1991, pp.145-147).

The crucial question: how does the operational level of trust and trustworthiness in organizations impact organizational learning?

H1: Interpersonal trust at the (i) organizational (ii) managerial and (iii) coworker levels is (a) directly related to organizational learning style and learning dimensions and (b) inversely related to learning disabilities.

Methodology

Sample:

This study was done on 147 managers (M = 81, F = 19) from the manufacturing and service sector. The mean age of the sample was 38.94 (S.D = 8.87), mean experience

as managers was 16.64 years (S.D. 9.17). 25.8% were undergraduates, 38.1% were graduates and 36.1% were postgraduates. Respondents were guaranteed confidentiality and completed the set of measures anonymously and voluntarily on organization time or at home if it was difficult to find time during work hours.

Measures:

(i) Octapace (Pareek, 1992): 'Octa - eight steps (pace)' to create functional ethos, has forty items that measure organizational ethos in terms of Openness, Confrontation, Trust, Authenticity, Proaction, Autonomy, Collaboration and Experimentation (three items on values and two on beliefs on each of the eight dimensions). Respondents rate their organization on eight aspects, using a 4-point scale (1 = given a very low value, to 4 = highly valued/1 = few persons or none have this belief, to 4 = very widely shared belief). Sample items include "facing and not shying away from problems" "Encouraging employees to take a fresh look at how things are done" The scores range from 5 to 20 on each aspect. The reliability of the scale has been established by the author (Pareek, 1992).

(ii) *Leadership Practices Inventory* (Kouzes & Posner, 1988): contains thirty statements, with six statements measuring each of the five leadership practices. Sample statements include: "I seek out challenging opportunities which test my skills and abilities," "I let others know my beliefs on how to best run the organization I manage," and "I treat others with dignity and respect." Each statement is responded to on a five-point Likert scale: (1) Rarely or never do what is described in the statement, (2) Once in a while do what is described, (3) Sometimes do what is described, (4) Fairly often do what is described, and (5) Very frequently, if not always, do what is described in the statement. Factor analyses indicated that the scales were generally orthogonal.

(iii) *Trust Orientation Profile* (Chartier, 1991): contains twenty-four items, each consisting of two statements. Respondents distribute five points between the two alternatives (A and B) based on how they actually behaved or felt or how they actually perceived the situation. Sample items include " (A) ___ My coworkers have all the knowledge and experience they need to do their jobs effectively (B) ___ My coworkers seem to lack the knowledge and/or experience they need to do their jobs effectively" "(A) ___ When faced with a problem, I find out the best solution and present my idea to my coworkers (B) ___ When faced with a problem, I collaborate with my co-workers to define the problem, explore alternatives, and arrive at a solution". Trust orientation

(trust minus mistrust) is calculated on each of twelve dimensions: open-closed, willingness-unwillingness to risk, cooperative-competitive, expert-inept, accountable-unaccountable, supportive-controlling, respectful-disrespectful, genuine-hypocritical, mutual-superior, problem-solution centered, dependable-capricious. Cronbach's alpha for the sub scales ranged between .71 and .90 except for willingness to risk ($\alpha = .64$).

(iv) Organizational Learning Capability-Learning Styles and Dimensions (Yeung, Ulrich, Nason, & Glinow, 1999): contains twenty-four questions based on six learning dimensions; namely, where learning occurs: within / across boundaries (six items), who does the learning: individuals / teams (collectives) (six items), when learning occurs: mastery / ongoing (two items), what learning focuses on: improving existing processes / inventing new processes (two items), how we learn: expert / experimenter / innovator / copier (seven items), why we learn: strategic / operational (one item). Subjects responded to a five- point scale ranging from 1 = to very little extent to 5 = to very large extent to the question: To what extent do the following statements characterize your business? Sample items include "We primarily learn new ideas within the boundaries of our team" "We constantly seek new ideas even before old ones are fully implemented". Four organizational learning types were derived from the 24 questions: experimentation ($\alpha = .77$), continuous improvement ($\alpha = .75$), knowledge/skill acquisition ($\alpha = .75$) and benchmarking ($\alpha = .70$). Factor analysis confirmed the existence of four organizational learning types derived from the 24 questions.

(ii) Learning Disabilities (Yeung, Ulrich, Nason, & Glinow, 1999): contains thirty-four questions based on learning disabilities. Confirmatory factor analysis identified eleven learning disabilities, seven of which have the most significant relationships with business context and performance. Subjects responded to the question: To what extent do the following statements characterize your business? (on a 5-point scale ranging from 1 = to very little extent to 5 = to very large extent). Item 7 "If it ain't broke, don't fix it" would represent the general attitude here pretty well' was reworded: 'If things seem to be working well, don't try to bring about improvements, would represent the general attitude here pretty well'.

Results

Separate canonical correlation analyses between (i) the learning styles (ii) the learning dimensions and (iii) the learning disabilities sets and each of the interpersonal trust sets: organizational, managerial and coworker trust sets was undertaken. After the first pair of canonical variates was determined, no further significant combinations seemed

to exist for learning styles and learning dimensions. The structure correlations (canonical factor loadings) and the canonical coefficients were both used in interpretation.

Organizational trust and learning styles

For the learning styles set and organizational trust set, the maximum canonical correlation was .72, ($\chi^2_{(32)} = 118.50, p < .0005$). The proportion of variance accounted for by the correlation between the respective canonical variates (R_c^2) was 52%. The loadings and weights in Table 1 suggest that the organizational trust dimension of confrontation was associated with the continuous improver and skill acquirer learning styles. The percent of variance explained by the canonical variate of the organizational trust set, was slightly greater (60%) than the percent of variance explained by canonical variate of the learning styles set (56%); that is, set 2 was a slightly better representative of its set. Looking at the redundancies, the canonical variate of set 2, explained 31% of the variance in set 1. The variate of set 1 explained 29% of the variance in set 2.

Table 1: Canonical correlation analysis between the learning styles set and the organizational trust set.

	Canonical variate	
	Correlation	Coefficient
Learning Styles Set		
<i>Experimenter-Innovator</i>	.80	.22
<i>Competency worker-Skill Acquirer</i>	.85	.47
<i>Copier-Benchmarker</i>	.28	-.41
<i>Expert-Continuous Improver</i>	.89	.60
Percent of Variance	.56	
Redundancy	.29	
Organizational Trust Set		
<i>Openness</i>	.85	.06
<i>Confrontation</i>	.97	.70
<i>Trust</i>	.76	-.06
<i>Authenticity</i>	.69	.17
<i>Proaction</i>	.83	.09
<i>Autonomy</i>	.34	-.04
<i>Collaboration</i>	.77	.02
<i>Experimentation</i>	.82	.15
Percent of Variance	.60	
Redundancy	.31	
Canonical correlation	.72	

$$\chi^2_{(32)} = 118.50, p < .0005$$

Managerial trust and learning styles:

Here, the canonical correlation failed to reach significance at the .05 level.

Coworker trust and learning styles:

The maximum canonical correlation between the coworker trust set and the learning styles set was .59 ($\chi^2_{(48)} = 93.16, p < .0005; R_c^2 = .35$). The loadings and weights in Table 2 indicate that higher levels of the coworker trust dimensions of accountability and expertise were primarily associated with the continuous improver and skill acquirer learning styles. The percent of variance explained by the canonical variate of the learning styles set of the variance in its set was 56%. The total variance explained by the canonical variate of the coworker trust set of the variance in its set was 20%. Thus set 1 was a better representative of its set than set 2. Looking at the redundancy, Set 1 explained 19% of the variance in set 2. Set 2 explained 7% of the variance in set 1.

Table 2: Canonical correlation analysis between the learning styles set and the coworker trust set.

	Canonical variate Correlation	Coefficient
Learning Styles Set		
<i>Experimenter-Innovator</i>	.72	-.06
<i>Competency worker-Skill Acquirer</i>	.84	.45
<i>Copier-Benchmarker</i>	.35	-.26
<i>Expert-Continuous Improver</i>	.95	.79
Percent of Variance	.56	
Redundancy	.19	
Coworker Trust Set		
<i>Open-Closed</i>	.30	-.20
<i>Willing-Unwilling to risk</i>	.18	.03
<i>Cooperative-Competitive</i>	.62	.28
<i>Accepting, Warm-Rejecting, Cold</i>	.21	-.12
<i>Expert-Inept</i>	.81	.62
<i>Accountable-Unaccountable</i>	.80	.49
<i>Supportive-Controlling</i>	-.05	-.05
<i>Respectful-Disrespectful</i>	.32	-.16
<i>Genuine-Hypocritical</i>	.29	.03
<i>Mutual-Superior</i>	.22	-.27
<i>Problem-Solution Centered</i>	.41	.34
<i>Dependable-Capricious</i>	.31	-.09
Percent of Variance	.20	
Redundancy	.07	
Canonical correlation	.59	

$\chi^2_{(48)} = 93.16, p < .0005$

Organizational trust and learning dimensions

Here, the maximum canonical correlation was .75, $\chi^2_{(72)} = 161.84$, $p < .0005$; $R_c^2 = .56$, see table 3). The loadings and weights in Table 3 indicate that higher levels of confrontation were associated with the learning dimensions of inventing new processes, individual learning, and mastery learning. Set 2 was a better representative of its set and the canonical variate of set 2, explained more of the variance in set 1 than vice versa.

Table 3: Canonical correlation analysis between the learning dimensions and the organizational trust set.

	Canonical variate	
	Correlation	Coefficient
Learning Dimensions Set		
<i>Within Boundaries</i>	-.58	-.12
<i>Across Boundaries</i>	-.24	.12
<i>Individual Learning</i>	-.84	-.35
<i>Team Learning</i>	-.83	-.21
<i>Mastery Learning</i>	-.76	-.34
<i>Ongoing Learning</i>	-.47	.11
<i>Improving existing processes</i>	-.72	.21
<i>Inventing new processes</i>	-.83	-.39
<i>Strategic learning</i>	-.69	-.17
Percent of Variance	.47	
Redundancy	.27	
Organizational Trust Set		
Openness	-.76	.19
Confrontation	-.95	-.67
Trust	-.76	-.02
Authenticity	-.60	-.06
Proaction	-.86	-.22
Autonomy	-.23	.13
Collaboration	-.77	-.06
Experimentation	-.85	-.30
Percent of Variance	.57	
Redundancy	.32	
Canonical correlation	.75	

$$\chi^2_{(72)} = 161.84, p < .0005$$

Managerial trust and learning dimensions

The maximum canonical correlation between the managerial trust set and the learning dimensions set was .50, ($\chi^2_{(45)} = 65.79$, $p = .023$; $R_c^2 = .25$, see table 4). The loadings

and weights in Table 4 indicate that the leadership practices of enabling others to act to a large extent and challenging the process to a lesser extent were associated with higher levels of the learning dimensions of strategic learning, inventing new processes, learning within boundaries. Interestingly these same outcomes were associated with lower levels of the leadership practice of encouraging the heart. The canonical variate of set 2 was a better representative of its set, explaining 52% of the variance in its set and 13% of the variance in set 1. The canonical variate of the learning dimensions set explained 13% of the variance in its set and 3% of the variance in set 2.

Table 4: Canonical correlation analysis between the learning dimensions and managerial trust set

	Canonical Correlation	Canonical variate Coefficient
Learning Dimensions Set		
<i>Within Boundaries</i>	.52	.48
<i>Across Boundaries</i>	.33	.31
<i>Individual Learning</i>	-.05	-.65
<i>Team Learning</i>	.17	-.44
<i>Mastery Learning</i>	.27	-.05
<i>Ongoing Learning</i>	.07	-.33
<i>Improving existing processes</i>	.40	.26
<i>Inventing new processes</i>	.50	.58
<i>Strategic learning</i>	.56	.60
Percent of Variance	.13	
Redundancy	.03	
Managerial Trust Set		
<i>Challenging the Process</i>	.77	.36
<i>Inspiring a Shared Vision</i>	.64	.11
<i>Enabling Others to Act</i>	.93	1.01
<i>Modeling the Way</i>	.67	-.12
<i>Encouraging the Heart</i>	.53	-.42
Percent of Variance	.52	
Redundancy	.13	
Canonical correlation	.50	

$$\chi^2_{(45)} = 65.79, p = .023$$

Coworker trust and learning dimensions:

The maximum canonical correlation between the coworker trust set and the learning dimensions set was .58 ($\chi^2_{(108)} = 142.88, p = .014; R_c^2 = .34$). The loadings and weights in Table 5 indicate that primarily lower levels of the coworker trust dimensions of accountability; expertise and cooperativeness were associated with lower levels of team learning and inventing new processes. The percent of variance explained by the

canonical variate of the learning dimensions set of the variance in its set was 42%. The total variance explained by the canonical variate of the coworker trust set of the variance in its set was 20%. Thus set 1 was a better representative of its set than set 2. Looking at the redundancy coefficient R_d , Set 1 explained 14% of the variance in set 2. Set 2 explained 7% of the variance in set 1.

Table 5: Canonical correlation analysis between the learning dimensions and the coworker trust set.

	Canonical variate	
	Correlation	Coefficient
Learning Dimensions Set		
<i>Within Boundaries</i>	-.49	-.03
<i>Across Boundaries</i>	.02	.39
<i>Individual Learning</i>	-.73	-.13
<i>Team Learning</i>	-.85	-.46
<i>Mastery Learning</i>	-.65	-.11
<i>Ongoing Learning</i>	-.43	.07
<i>Improving existing processes</i>	-.76	-.12
<i>Inventing new processes</i>	-.81	-.36
<i>Strategic learning</i>	-.64	-.12
Percent of Variance	.42	
Redundancy	.14	
Coworker Trust Set		
<i>Open-Closed</i>	-.38	.04
<i>Willing-Unwilling to risk</i>	-.06	.14
<i>Cooperative-Competitive</i>	-.68	-.31
<i>Accepting, Warm-Rejecting, Cold</i>	-.23	.14
<i>Expert-Inept</i>	-.78	-.46
<i>Accountable-Unaccountable</i>	-.86	-.64
<i>Supportive-Controlling</i>	.02	.02
<i>Respectful-Disrespectful</i>	-.37	.06
<i>Genuine-Hypocritical</i>	-.22	.15
<i>Mutual-Superior</i>	-.24	.20
<i>Problem-Solution Centered</i>	-.32	-.17
<i>Dependable-Capricious</i>	-.31	.06
Percent of Variance	.20	
Redundancy	.07	
Canonical correlation	.58	

$$\chi^2_{(108)} = 142.88, p = .014$$

Organizational trust and Learning Disabilities:

The first two canonical variates were significant, $R_{c1} = .74$, $\chi^2_{(56)} = 172.37$, $p < .0005$ and $R_{c2} = .44$, $\chi^2_{(42)} = 67.79$, $p = .007$; $R_{c1}^2 = .55$, $R_{c2}^2 = .19$ (see table 6). For the first canonical correlation, the independent canonical variable was able to predict only 34% of the variance in the individual original dependent variables. The dependent canonical

variable accounted for 22% of the variance in the individual original independent variables. Also, the independent canonical variable explained 61% of the variance in the individual original independent variables whereas the dependent canonical variable explained only 39% of the variance in the individual original dependent variables.

Table 6: Canonical Correlation analysis between the Learning Disabilities set and the Organizational Trust set

	First Canonical Variate		Second Canonical Variate	
	Correlation	Coefficient	Correlation	Coefficient
Learning Disabilities set				
Generation				
<i>Blindness</i>	.51	.13	-.47	-.25
<i>Simplemindedness</i>	.44	-.08	-.59	-.32
<i>Homogeneity</i>	.60	.41	-.58	-.33
<i>Tight Coupling</i>	-.63	-.36	-.55	-.44
Generalization				
<i>Paralysis</i>	.74	.17	.16	.48
<i>Superstitious Learning</i>	.64	.05	-.31	-.53
<i>Diffusion Deficiency</i>	.76	.45	.11	.22
Percent of Variance	.39		.19	
Redundancy	.22		.04	
Organizational Trust Set				
<i>Openness</i>	-.82	-.13	.04	-.51
<i>Confrontation</i>	-.86	-.25	.22	.05
<i>Trust</i>	-.77	.05	.10	-.23
<i>Authenticity</i>	-.68	-.08	-.14	-.37
<i>Proaction</i>	-.73	.10	.60	1.49
<i>Autonomy</i>	-.55	-.14	-.19	.05
<i>Collaboration</i>	-.92	-.45	-.04	-.66
<i>Experimentation</i>	-.87	-.29	.20	.34
Percent of Variance	.61		.06	
Redundancy	.34		.01	
Canonical correlation	.74		.44	
$\chi^2_{(56)} = 172.37, p < .0005$		$\chi^2_{(42)} = 67.79, p = .007$		

For the second canonical correlation, the independent canonical variable was able to predict only 1% of the variance in the individual original dependent variables and only 6% of the variance in the individual original independent variables. The dependent canonical variable accounted for 4% of the variance in the individual original independent variables and 19% of the variance in the individual original dependent variables. The loadings and weights in Table 6 indicate (1) less emphasis on

collaboration, experimentation and confrontation was associated with the learning disabilities of diffusion deficiency and homogeneity, while less emphasis on collaboration, experimentation and confrontation was associated with less tight coupling; (2) that lower levels of proaction were associated with primarily with the learning disabilities of generation, namely tight coupling, homogeneity, simplemindedness and blindness.

Learning disabilities and managerial trust:

The first two pairs of canonical variates were significant, $R_{c1} = .46$, $\chi^2_{(35)} = 75.48$, $p < .0005$, $R_{c2} = .36$, $\chi^2_{(24)} = 42.99$, $p = .010$; $R_{c1}^2 = .21$, $R_{c2} = .13$ (see table 7). For the first

Table 7: Canonical Correlation analysis between the Learning Disabilities set and the Managerial Trust set

	First Canonical Variate		Second Canonical Variate	
	Correlation	Coefficient	Correlation	Coefficient
Learning Disabilities set				
Generation				
<i>Blindness</i>	-.72	-.59	-.36	-.58
<i>Simplemindedness</i>	-.41	.06	.04	-.18
<i>Homogeneity</i>	-.67	-.35	.25	.38
<i>Tight Coupling</i>	-.27	-.38	-.09	.17
Generalization				
<i>Paralysis</i>	-.34	-.39	.63	1.03
<i>Superstitious Learning</i>	-.24	-.11	-.08	-.59
<i>Diffusion Deficiency</i>	.21	.50	.14	.15
Percent of Variance	.20		.09	
Redundancy	.04		.01	
Managerial Trust Set				
<i>Challenging the Process</i>	.64	.82	-.44	-.99
<i>Inspiring a Shared Vision</i>	.09	-.80	-.42	-.57
<i>Enabling Others to Act</i>	.75	.93	.16	.27
<i>Modeling the Way</i>	.45	-.03	.03	.36
<i>Encouraging the Heart</i>	.38	-.36	.32	.85
Percent of Variance	.27		.10	
Redundancy	.06		.01	
Canonical correlation	.46		.36	

$\chi^2_{(35)} = 75.48$, $p < .0005$

$\chi^2_{(24)} = 42.99$, $p < .01$

canonical correlation, the independent canonical variable was able to predict only 6% of the variance in the individual original dependent variables and explained 27% of the variance in the individual original independent variables. The dependent canonical variable accounted for 4% of the variance in the individual original independent

variables and explained 20% of the variance in the individual original dependent variables.

For the second canonical correlation, the independent canonical variable was able to predict only 1% of the variance in the individual original dependent variables and explained only 10% of the variance in the individual original independent variables whereas the dependent canonical variable explained 9% of the variance in the individual original dependent variables and accounted for 1% of the variance in the individual original independent variables. The loadings and weights in Table 7 indicate (1) primarily higher levels of the leadership practice of enabling others to act and challenging the process were together associated with lower levels of the learning disabilities of blindness and homogeneity to a large extent and paralysis to some extent; 2) lower levels of challenging the process, inspiring a shared vision and higher levels of encouraging the heart were associated with higher levels of paralysis and lower levels of blindness.

Learning disabilities and coworker trust:

Here again, the first two pairs of canonical variates were significant, $R_{c1} = .53$ ($\chi^2_{(84)} = 140.85$, $p < .0005$), $R_{c2} = .48$ ($\chi^2_{(66)} = 97.99$, $p = .006$); $R_{c1}^2 = .28$, $R_{c2}^2 = .23$ (see Table 8). The independent canonical variable was able to predict only 6% of the variance in the individual original dependent variables and explained 20% of the variance in its set. The dependent canonical variable accounted for 9% of the variance in the individual original independent variables and 30% of the variance in its set.

For the second canonical correlation, the independent canonical variable was able to predict only 2% of the variance in the individual original dependent variables and explained only 8% of the variance in the individual original independent variables, whereas the dependent canonical variable accounted for 3% of the variance in the individual original independent variables, and 14% of the variance in the individual original dependent variables.

The loadings and weights in Table 8 indicate (1) primarily lower levels of dependability, accountability, expertise, respect, openness (and problem centeredness to a small extent) were associated with the learning disabilities of paralysis, superstitious learning and homogeneity; (2) lower levels of accountability, supportiveness and cooperativeness corresponded to higher levels of blindness, superstitious learning and diffusion deficiency.

Table 8: Canonical Correlation analysis between the Learning Disabilities set and the Coworker Trust set

	First Canonical Variate		Second Canonical Variate	
	Correlation	Coefficient	Correlation	Coefficient
Learning Disabilities set				
Generation				
<i>Blindness</i>	.23	-.22	.58	.66
<i>Simplemindedness</i>	.45	-.06	-.06	-.27
<i>Homogeneity</i>	.65	.43	-.06	-.28
<i>Tight Coupling</i>	-.24	.03	-.17	-.01
Generalization				
<i>Paralysis</i>	.84	.58	-.02	-.53
<i>Superstitious Learning</i>	.75	.54	.59	.66
<i>Diffusion Deficiency</i>	.27	-.30	.50	.37
Percent of Variance	.30		.14	
Redundancy	.09		.03	
Coworker Trust Set				
Open-Closed	-.56	-.21	-.05	.12
Willing-Unwilling to risk	-.20	.01	.17	.26
<i>Cooperative-Competitive</i>	-.32	.27	-.56	-.50
<i>Accepting, Warm-Rejecting, Cold</i>	-.21	.12	-.29	-.18
<i>Expert-Inept</i>	-.69	-.29	-.14	.22
<i>Accountable-Unaccountable</i>	-.66	-.42	-.50	-.67
<i>Supportive-Controlling</i>	.32	.32	-.49	-.62
<i>Respectful-Disrespectful</i>	-.51	-.25	-.16	.00
<i>Genuine-Hypocritical</i>	-.34	.15	.10	.36
<i>Mutual-Superior</i>	-.10	.33	-.05	.43
<i>Problem-Solution Centered</i>	-.37	-.26	-.01	.13
<i>Dependable-Capricious</i>	-.63	-.44	-.08	-.07
Percent of Variance	.20		.08	
Redundancy	.06		.02	
Canonical correlation	.53		.48	

$\chi^2_{(84)} = 140.85, p < .0005$

$\chi^2_{(66)} = 97.99, p = .006$

Conclusions

The results of this study on the relation between interpersonal trust and organizational learning capability suggest that interpersonal trust at all levels, although particularly at the organizational and coworker levels is crucial to knowledge acquisition, sharing and utilization - the generation and generalization of ideas. The organizational trust set accounted for 31% of the variance in learning styles (confrontation - facing and not

shying away from problems was related to skill acquisition and continuous improvement); 32% of the variance in learning dimensions (confrontation and to some extent experimentation were related to inventing new processes, individual learning, and mastery learning); and 35% of the variance in learning disabilities (lower levels of collaboration were related to higher levels of homogeneity and diffusion deficiency and interestingly lower levels of tight coupling). In comparison, managerial trust was not significantly related to learning style and explained only 13% of the variance in learning dimensions and 7% of the variance in learning disabilities; whereas coworker trust explained 7% of the variance in learning styles and dimensions and 8% of the variance in learning disabilities.

Interestingly, redundancy analyses indicated that learning orientation and disabilities also accounted for some of the variance in organizational, managerial and coworker trust which show that interpersonal trust levels may be influenced by the existing organizational learning capability.

The results provide support for models of organizational learning that underscore the need for a trust-based system to facilitate learning, and corroborate earlier research on the importance of trust in knowledge management. Organizational learning capability is facilitated by a system committed to the truth, one that encourages confrontation, that fosters openness, transcends politics and game playing such that problems, errors, lessons are shared, not hidden; debate and conflict are acceptable ways to solve problems; 'failures' are accepted not punished; a system that supports curiosity, trying new things, changes in work process (Nevis, DiBella & Gould, 1995; Senge, 1990).

There are, however, some interesting findings at the managerial and coworker trust levels (i) the relationship between higher levels of the *managerial practice* of enabling others to act, challenging the process, lower levels of encouraging the heart and *strategic learning*; lower levels of challenging the process, inspiring a shared vision and the generalization failure of *paralysis* and (ii) the relationship between the *coworker trust* dimensions of accountability, expertise and cooperativeness and *team learning*; which was stronger than that observed for managerial or organizational trust. These findings have implications for organizational learning initiatives.

In conclusion, the contribution of this research is twofold: (i) a corroboration of the importance of interpersonal trust as a 'theory-in-use'; a core value permeating the system and (ii) a proposal of the links between specific dimensions of organizational,

managerial and coworker trust and learning capability (orientation and learning disabilities), which provide a direction for organizational learning investments which may focus on any stage of the learning cycle- knowledge, acquisition, dissemination or utilization.

One of the main limitations of this study is size of sample. A sufficiently large sample size is required to obtain reliable results with canonical correlation analysis; if there are strong canonical correlations in the data (e.g., $R > .7$), then even relatively small samples (e.g., $n = 50$) will detect them most of the time. However, in order to arrive at reliable estimates of the canonical factor loadings (for interpretation), Stevens (1986) recommends that there should be at least 20 times as many cases as variables in the analysis, if one wants to interpret the most significant canonical root only. To arrive at reliable estimates for two canonical roots, Barcikowski and Stevens (1975) recommend, based on a Monte Carlo study, to include 40 to 60 times as many cases as variables. Further, canonical solution rotations lead to a simpler structure. However, this was not done since it violates the fundamental logic of canonical analysis; "the importance of keeping separate the independent and dependent sets of variables" (Thompson, 1984, p. 38).

Further research with larger samples carefully selected across industry, size or age of an organization or the nature of its technology can use path analysis or structural equation modeling to extend these findings and more specifically delineate the linkages between interpersonal trust at the organizational, managerial and coworker levels and organizational learning capability.

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