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Unmasking Barriers to Knowledge Sharing Using a Communication Framework

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UNMASKING BARRIERS TO KNOWLEDGE SHARING USING A COMMUNICATION FRAMEWORK

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Abstract

This proposal outlines the development of a field experiment and survey to investigate barriers to knowledge sharing within an organizational environment. In particular, this study will evaluate knowledge workers' perceptions regarding the relative importance of different types of barriers to knowledge sharing and investigate a possible relationship between the perceived relative importance of the barriers and the knowledge-sharing context. The purpose of this study is to inform researchers and practitioners so that future research and management efforts can be focused on reducing or eliminating barriers that have the most prohibitive effects on intraorganizational knowledge sharing.

A field experiment is proposed where knowledge workers in a large service organization are presented with four hypothetical situations that represent different knowledge sharing contexts. A Q-sort technique is proposed to evaluate the relative impediment that each of the barriers present in that context. The results of the quasi-experiment will be validated by surveying a different set of knowledge workers in the same organization.

Keywords: Knowledge sharing, barriers, communication framework, Q-methodology

Introduction

Knowledge Management (KM) research remains a new endeavor. It spans many disciplines and has been studied from a variety of perspectives. Cognitive psychologists research attitudes toward knowledge sharing. Organizational theorists examine structural factors that influence KM success. Computer scientists seek the perfect combination of hardware and software that would make sharing knowledge simpler. In a manner very similar to the six blind men who encountered an elephant and drew strikingly different conclusions about the animal (Saxe 1963), researchers in each of these (and many other) disciplines view KM as something quite distinct. This research will attempt to bridge these perspectives by investigating the way knowledge is shared by viewing knowledge sharing as a communication process. Specifically, this study will attempt to identify and evaluate barriers to the process of sharing knowledge within an organization.

Research Questions and Approach

In order to manage knowledge, researchers must develop an understanding of the way that knowledge flows through an organization. The flow of knowledge is reflected in the most basic construct of this study, knowledge sharing. This construct will be clearly defined in the literature review and an attempt will be made to identify barriers to knowledge sharing that exist in an organizational setting. To understand the way these barriers impede the flow of knowledge through an organization, one primary and one secondary question concerning these barriers must be addressed:

RQ1: Are some of the barriers to knowledge sharing relatively more important than others?
RQ2: Does the relative importance depend upon the context of the knowledge-sharing event?

In order to answer these questions, the act of sharing knowledge will be evaluated as a communication event, using a circular model of communication as a framework. Knowledge sharing will be analyzed in terms of communicating a message where the

knowledge is the message, an expert is the sender, an apprentice is the receiver, one or more channels is employed, the process is subject to noise, and the apprentice may provide feedback to the expert. It is recognized that the communication framework neglects consideration of the complexity of the message and the context in which the message is shared. Thus, the purpose of this research is not to suggest that knowledge sharing can be fully described in terms of a communication process, but rather that the communications research may provide additional insight applicable to KM. Note that the framework shown in Figure 1 is not an experimental model, it was adopted solely to help ensure the barriers to knowledge sharing which will be tested are representative of a full set of potential barriers to the knowledge sharing process.

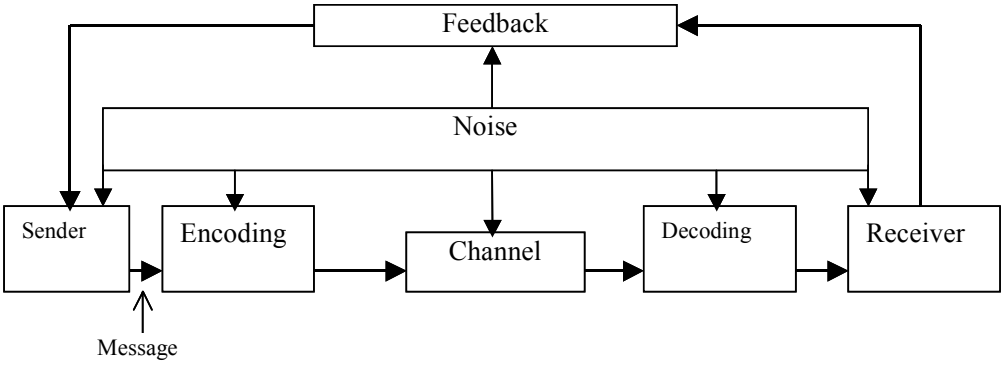

Figure 1. Communication Model

Literature Review

With just a little more than a decade of research, KM remains a new frontier. In fact, there is still not a commonly accepted definition of "Knowledge Management" (Bennett & Gabriel 1999). It is a phrase that means many different things to many different people. At one end of the spectrum, software engineers view the field strictly as the codification of tacit knowledge, mainly through the use of software applications that collect and categorize data created during the performance of some organizational task. In the middle of the spectrum one finds managers who consider KM to be the establishment of organizational systems or procedures that can be used to monitor and control the flow of knowledge. At the other end of the spectrum are forward thinkers who proclaim KM as the primary organizational task, people who maintain that everything the organization does can be evaluated as some element of creating and applying knowledge.

Accompanying these practical issues is a problem in academic research, where there is some concern that the study of "Knowledge Management" does not deal specifically with knowledge, management or the combination (Alvesson, Karreman, & Swan 2002). This study is aimed to reverse that trend by avoiding the semantic issues associated with KM and focus specifically on the process of sharing knowledge in an organizational context. In this research, barriers to knowledge sharing are actually measured in terms of knowledge workers' *perceptions* of barriers to knowledge sharing.

Importance of Context in Knowledge Management

Following a review of the state of research into KM and KM systems, Alavi and Leidner (2001) provided a framework for analysis of organizational KM processes. They identified four knowledge processes: creation, storage/retrieval, transfer, and application. All four processes are considered ways to share knowledge:

- Creation is an interaction between individuals, and includes the exchange of tacit and explicit knowledge.
- Storage/retrieval focuses on issues relating to organizational memory – tacit and explicit.
- Transfer includes a variety of interactions: individuals and groups; within, between, and across groups; and from groups to the organization.
- Application as knowledge integration to create organizational capability: Directives, organizational routines, and self-contained task teams.

These processes will be adopted in this research where they will each represent a "knowledge-sharing context." That is, the subjects of the experiment will be asked to consider one of these contexts as they evaluate barriers to knowledge sharing.

Knowledge Sharing

The concept of knowledge sharing in this research will be consistent with that used by Foy (1999) – "facilitating learning, through sharing, into usable ideas, products and processes". This definition implies that the focus will be on sharing knowledge within an organization for a specific purpose.

Barriers to Knowledge Sharing

Consistent with a goal of MIS research and the framework provided by Barson, et al., (2000), most of the barriers to knowledge sharing seem to address people, organizations, and/or technology. In particular, attitudes toward knowledge sharing (of both the sender and the receiver) and usefulness/ease of use of the technology emerge as dominant themes of KM research. Also, there are some conflicting factors such as expected rewards. Weiss (1999) and Barson, et al. (2000) determined that rewards were important factors for encouraging knowledge sharing while Bock and Kim (2002) found rewards were not significant. A summary of the barriers to knowledge sharing that have been identified in the KM literature is in Table 1.

Table 1. Summary of Barriers to Knowledge Sharing from KM Research

Study	Potential Barrier
Anonymous (1998)	simplicity, access, usability, motivation to participate
Okunoye & Karsten (2002)	operating environmental factors, national culture and beliefs, local orientation
Bock & Kim (2002)	associations, contribution, (but not reward)
Fraser Marcella & Middleton (2000)	lack of a "knowledge-sharing facility"
Weiss (1999)	time limitations, lack of rewards, common practices in professional services, lack of recognition, lack of reciprocity
Ellis (2001)	contribution, accuracy, recognition
Dixon (2002)	absorptive capacity, understanding of context, perception that gaining knowledge is of worth, confidence in the knowledge, feeling that the knowledge fits into current context
Hall (2001)	user friendliness
Levina (2001)	low trust, lack of contextual clues, memory loss, discontinuity in progress toward goals, inability to voice relevant knowledge, unwillingness to listen, and differences in: unit subculture, unit goals, local problem constraints, professional cultures, professional goals, specialized languages and methodologies, national cultures, languages
Dyer & Nobeoka (2000)	network that motivates participation, prevention of free riders, and reduction of the costs of knowledge search
Barson, et al., (2000)	Personal - internal resistance, self-interest, trust, risk, fear of exploitation, fear of contamination, proprietary thinking, skepticism toward sharing, lack of common ground, and fear – of exploitation, contamination, penalty, becoming redundant, losing power, losing resources, losing confidentiality, Organizational - targeting, costs, proprietary knowledge, distance, and Technological - available technology, legacy systems, efficiency and effectiveness of system, compatibility of system, Multidimensional - culture, rewards, and existing resources
McDermott & Odell (2001)	obvious link between knowledge sharing and business problems, tools and structures for knowledge sharing consistent with the overall style of the organization, reward and recognition systems that support knowledge sharing, availability of time
Cabrera & Cabrera (2002)	payoffs for contributing, enhanced efficacy perceptions, strengthened group identity and personal responsibility

Communications

The Communication Process

In order to facilitate the identification of a complete set of potential barriers to knowledge sharing, a communication model was developed and the barriers to knowledge sharing mapped onto the model. The communication model in Figure 1 is based upon the Shannon & Weaver (1949) transmission model of communication as adapted by Schramm (1965) to model human communication. In recognition that human communication is subject to a far wider range of interferences, Figure 1 accounts for noise within each step of the communication process. Finally, to acknowledge the importance of meaning, a feedback loop based on the Osgood-Schramm circular model of communication (McQuail & Windahl 1981) is included.

Barriers to Communication

As defined by Jablin (1979), communication is the process used to transfer information and influence from one entity to another. Research on barriers to communication may have the potential to supplement research on barriers to knowledge sharing since knowledge sharing can be viewed as the transfer of information and influence from one entity to another. The additional potential barriers which were derived from research in this area are presented in Table 2.

In order to validate the assertion that these barriers are representative of a complete set of barriers to communication, they have been subjectively categorized using the elements of the communication model.

Table 2. Additional potential barriers to Knowledge Sharing derived from Communications Research

Category	Barrier	Study
Sender	ambiguity regarding peers and ethical situations	Johlke et al..(2000)
	status or position, poor organization of ideas	Golen & Boissoneau (1987)
	power and status relationships	Blagdon (1973)
Encoding	poor communication skills (lack of clarity & conciseness)	Bennett & Olney (1986)
Channel	appropriateness of a channel, effectiveness of a channel	Westmeyer, DiCioccio, and Rubin (1998), Weiss (1999), Gupta & Govindarajan (2000)
	communication mode	Johlke et al..(2000)
Decoding	defensiveness, differences in perceptions, emotional reactions, inability to understand nonverbal communication, information overload, prematurely jumping to conclusions	Golen & Boissoneau (1987)
	state of mind, passive listening, preoccupation with an ongoing task	Messmer (1998)
	tendency of the receiver to evaluate	Rogers and Roethlisberger (1991)
Receiver	conflict	Golen, Catanach, & Moeckel (1997)
	personality conflicts, prejudice or bias	Golen & Boissoneau (1987),
Message	communication content, direction, and frequency	Johlke et al..(2000)
Feedback	improper feedback	Messmer (1998), Golen & Boissoneau (1987)
	sensemaking and feedback	Lewis (2000)
Noise	ambiguity regarding the knowledge sharing task or procedures	Messmer (1998)
	creating and communicating vision	Lewis (2000)
	physical noise and distractions, informal social groups or cliques, poor spatial arrangements	Golen & Boissoneau (1987)

The Communications literature presents a more broad perspective concerning these barriers to communication, and they can readily be considered barriers to knowledge sharing. These potential barriers will be tested along with the barriers identified in the KM research to determine their effect on the knowledge sharing process.

The Hypotheses

Evaluation of Barriers to Knowledge Sharing

As discussed, the barriers to knowledge sharing can be categorized as Personal, Technological, and Organizational. Interestingly, the "most important" of these barriers are often considered to be those that fall within the subject area of the researcher. By adopting a communication framework for knowledge sharing, a set of barriers to knowledge sharing that spans all research areas can be generated and presented to knowledge workers, allowing them to indicate which are most important. The most efficient development of tools to manage knowledge would begin by identifying barriers that have a greater negative impact on the knowledge sharing process. To explore this issue, three competing hypotheses are presented:

H1a: Organizational factors are perceived to present greater barriers to knowledge sharing than personal or technological factors.

H1b: Personal factors are perceived to present greater barriers to knowledge sharing than organizational or technological factors.

H1c: Technological factors are perceived to present greater barriers to knowledge sharing than personal or organizational factors.

Relative Importance of Barriers to Knowledge Sharing

It is possible that KM may be too large a field to make a single, encompassing statement regarding the "most important" barriers to knowledge sharing. While such a finding would dramatically simplify future KM research (and application), there is no theoretical basis that would lead to an expectation of a fixed ranking. Indeed, the importance of context in knowledge sharing situations cannot be overstated. Given such importance, it is expected that the knowledge sharing process could differ for differing contexts, making it unlikely that a static list of the most important barriers to knowledge sharing may be constructed. To investigate this, a proposition is offered to investigate the stability of the relative influence that each of the different types of barriers have on the knowledge sharing process. The corresponding hypotheses create a family of 12 hypotheses of the general form:

H2i: In context (I), barriers to knowledge sharing related to (J) are perceived to be more prohibitive than other types of barriers,
Where I is the knowledge context (Creation, Storage, Transfer or Application)
And J is the type of barrier (Organizational, Technological, or Personal)

Research Method

The research will be conducted in a combination of three phases, each employing a different method. In the first phase, a literature review and interviews with experts will be used to develop a definitive set of barriers to knowledge sharing. The second phase will employ a field experiment to investigate knowledge workers' perceptions of these barriers to knowledge sharing and the possible relationship between these barriers and the knowledge-sharing context. The final phase will use a survey of knowledge workers to validate the findings of the experiment. Figure 2 shows the variable relationships for this experiment.

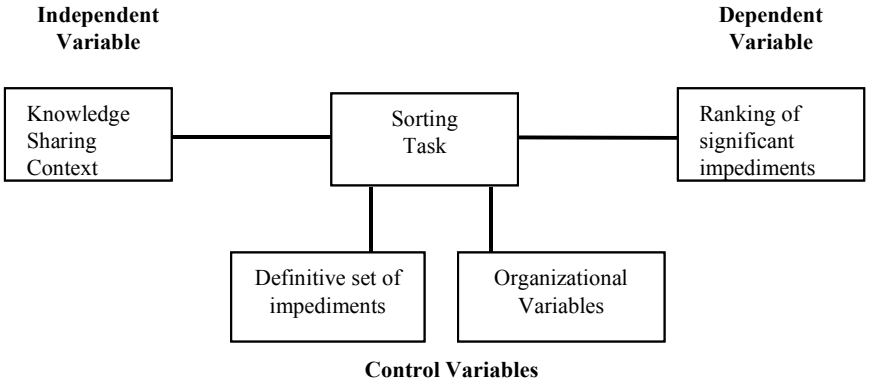

Figure 2. Variables and Variable Relationships

Variables and Variable Relationships

In the experiment, each subject will be asked to read a vignette representing one of the knowledge sharing contexts and then perform a Q-sort procedure to rank each of the potential barriers (the elements of the definitive set of impediments) according to the subject's perception of each barrier's relevance to that context. The experiment will require each subject to read and respond to vignettes corresponding to four different knowledge-sharing contexts.

Independent Variables

Because it is hypothesized that the ranking of the barriers to knowledge sharing may be context-sensitive, different knowledge sharing contexts must be represented in the experiment and manipulated as the independent variable. Knowledge sharing context, the independent variable in this experiment, will take the form of vignettes. Manipulation of the independent variables will be accomplished by creating a vignette to represent each knowledge-sharing context. Four vignettes will be developed to represent the four knowledge-sharing contexts (Knowledge Creation, Knowledge Storage/Retrieval, Knowledge Transfer, and Knowledge Application) that form the core processes of KM (Alavi & Leidner 2001).

Dependent Variables

The outcome variable for this experiment is the raters' perceptions of the relevance of the barriers to knowledge sharing for each process. This will be measured by the rankings achieved using a Q-sort technique. Each potential barrier to knowledge sharing will be sorted into one of nine categories on a scale of "most important" to "least important" which will be assigned integral values from +4 to –4. A forced distribution (a somewhat flattened normal curve) will be mandated to ensure that the raters carefully consider each potential barrier.

Control Variables

The primary controlled variable will be the definitive set of barriers to knowledge sharing. In order for the Q-sort procedure to be a valid measure of the perceptions of the subjects, each subject must given the same set of barriers to consider and rank. Demographic and organizational characteristic data will be collected to help account for the effects that the organization may have on the result, and also to help compare the results of this study with those of future similar studies.

Experimental Design

The unit of analysis for this study is the individual, and the data will be collected using a literature review, interviews with experts, a field experiment (Q-sort), and a survey. The field experiment and survey will employ the Contrastive Vignette Technique

(CVT) developed by Burstin, et al. (1980). This method is an excellent way to explore the perceptions of knowledge workers regarding the knowledge sharing process while minimizing the effect of the organization. Thomas and Watson (2002) specifically recommend the Q-sort methodology for MIS research, especially for examining human subjectivity. This method has been used to research knowledge workers' perceptions regarding the ownership of organizational information (Jarvenpaa & Staples 2001).

The Contrastive Vignette Technique will also be employed to validate the results of the Q-sort. A survey will be created that presents the same vignettes used in phase two, but rather than require the participants to perform a Q-sort procedure, six statements will follow each vignette and participants will be asked to indicate the degree to which they agree or disagree with each statement using a seven-point Likert scale. The statements associated with each vignette will be selected based on the outcome of the Q-sort rankings. Two statements will be taken from those found to be most important, two statements will be taken from those found to be least important, and two will be taken from those found to be of moderate importance.

Subjects

The only absolute requirement for subjects of this study is that they be (or have been) knowledge workers and have developed some perceptions concerning the sharing of knowledge. Many prior studies have used college students, especially upper division or graduate students, as proxies for knowledge workers. This research will aim for a more broad representation of knowledge workers by sampling actual knowledge workers employed in a large (>2000 person) governmental service organization.

Analysis of Results

Factor analysis with rotation will be performed on the Q-sort rankings. The survey results will be analyzed using Multiple Analysis of Variance to determine whether the subjects' perceptions of barriers to knowledge differ significantly. Internal consistency will be investigated using inter-rater reliability (for the vignettes) and Cronbach's alpha values (for the survey).

Limitations

The primary limitation is concerned with the generalizability of the findings. The generalizability of this research is suspect for two main reasons: The Q-methodology is not considered to be generalizable, and the field experiment with subsequent validation will be conducted in a single organization. Since no attempt will be made to generalize the results, use of a single organization (which facilitates greater control of the organizational variables) is preferable for this experiment. Future research in other organizations will be required in order to develop results that are generalizable. The Q-methodology was designed to gain greater understanding of subjective judgments using small, non-random samples. As that is the express goal of this research, the appropriateness of this methodology is deemed sufficient to justify the cost of generalizability.

Contributions to Knowledge and Future Research

The first contribution of this research is the use of the communication framework. By adopting a broad perspective of the knowledge-sharing process, a set of barriers can be examined to determine whether some of the barriers have a more significant impact on knowledge sharing, and this has significant implications for research and practice. This study may also help reveal the importance of context in KM research. Should the barriers to knowledge sharing be found to be constant, then context may be overlooked by future research. However, if differing knowledge contexts result in differing relative importance of barriers, this will call for more careful handling of context in future research. Finally, the specific results of the experiment may yield insight for managers who seek to improve knowledge sharing within their organizations.

It is expected that this dissertation will promote KM research by applying principles of a closely related research field in order to visualize a more broad perspective of the discipline. Knowledge sharing will be viewed as a communication process and known barriers to communication will be evaluated as possible barriers to knowledge sharing. A definitive set of barriers to knowledge sharing will be developed and validated through the use of a literature review and expert interviews. The field experiment will be performed in an organization populated with actual knowledge workers, but will present hypothetical situations to the participants in order to avoid specific organizational effects. This empirical study of perceptions toward knowledge sharing can help establish a foundation for a research stream in KM that is independent of the complexities of knowledge. By learning more

concerning the relative importance of barriers to knowledge sharing, researchers and practitioners may be able to focus their efforts on the areas that will provide the most benefit. By investigating the relationship between barriers to knowledge sharing and the knowledge-sharing context, the KM field can begin moving away from a "one size fits all" mentality and toward a future of practical KM solutions.

References

Alavi, M., and Leidner, D. E. "Review: Knowledge management and knowledge management systems: Conceptual foundations and research issues," *MIS Quarterly* (25:1), 2001, pp. 107-136.

Alvesson, M., Karremen, D., and Swan, J. "Departures from knowledge and/or management in knowledge management," *Management Communication Quarterly : McQ*, (16:2), Nov 2002, pp. 282-291.

Anonymous. "Buckman's knowledge sharing philosophy," *HRMagazine*, (43:2), 1998, p. 92.

Barson, R. J., Foster, G., Struck, T., Ratchev, S., Pawar, K., Weber, F., and Wunram, M. "Inter- and intra-organisational barriers to sharing knowledge in the extended supply chain," In: Stanford-Smith, B., Kidd, P.T. (Eds.). *E-business: Key Issues, Applications and Technologies*, Amsterdam: IOS Press, 2000. pp. 367-373.

Bennett, J. C., and Olney, R. J. "Executive priorities for effective communication in an information society," *The Journal of Business Communication*, (23:2), 1986, pp. 13-22.

Bennett, R, and Gabriel, H. "Organisational factors and knowledge management within large marketing departments: An empirical study," *Journal of Knowledge Management*, (3:3), 1999, pp. 212-225.

Blagdon, C. "Barriers to communication," *American Business Communication Association ABCA Bulletin*, (36:3), 1973, p. 12.

Bock, G. W., and Kim, Y. G. "Breaking the myths of rewards: An exploratory study of attitudes about knowledge sharing," *Information Resources Management Journal*, (15:2), 2002, pp. 14-21.

Burstin, K., Doughtie, E.B., and Raphaeli, A. "Contrastive vignette technique: An indirect methodology designed to address reactive social attitude measurement," *Journal of Applied Social Psychology*, (10:2), 1980, pp. 147-165.

Cabrera, A., and Cabrera, E. F. "Knowledge-sharing dilemmas," *Organization Studies*, (23:5), 2002, pp. 687-710.

Dixon, N. "The neglected receiver of knowledge sharing," *Ivey Business Journal*, (66:4), 2002, pp. 35-40.

Dyer, J. H., and Nobeoka, K. "Creating and managing a high-performance knowledge-sharing network: The Toyota case," *Strategic Management Journal*, (21:3), 2000, pp. 345-367.

Ellis, K. "Dare to share," *Training,* (38:2), Feb 2001, pp. 74-80.

Foy, P.S. "Knowledge management in industry," in J. Liebowitz, ed. *Knowledge Management Handbook*, New York: CRC Press, 1999, pp. 15.1 – 15.10.

Fraser, V., Marcella, R., and Middleton, I. "Employee perceptions of knowledge sharing: Employment threat of synergy for the greater good? A case study. *Competitive Intelligence Review*, (11:2), 2000, pp. 39-52.

Golen, S. P., and Boissoneau, R. "Health care supervisors identify communication barriers in their supervisor-subordinate relationships," *Health Care Supervisor*, (6:1), 1987, pp. 26-38.

Golen, S. P., Catanach, A. H. Jr., and Moeckel, C. "The frequency and seriousness of communication barriers in the auditor-client relationship," *Business Communication Quarterly*, (69:3), 1997, pp. 23-37.

Gupta, A., and Govindarajan, V. "Knowledge flows in multinational corporations," *Strategic Management Journal*, 21, 2000, pp. 473-496.

Hall, H. "Input-friendliness: Motivating knowledge sharing across intranets," *Journal of Information Science*, (27:3), 2001, pp. 139-146.

Jablin, F. M. "Superior-subordinate communication: The state of the art," *Psychological Bulletin*, 86, 1979, pp. 1201-1222.

Jarvenpaa, S. L., and Staples, D. S. "Exploring perceptions of organizational ownership of information and expertise," *Journal of Management Information Systems*, (18:1) 2001, pp. 151-183.

Johlke, M. C., Duhan, D. F., Howell, R. D., and Wilkes, R. W. "An integrated model of sales managers' communication practices," *Journal of the Academy of Marketing Sciences*, (28:2), 2000, pp. 263-277.

Levina, N. "Sharing knowledge in heterogeneous environments," *Reflections: The SoL Journal*, (2:2), 2001, pp. 32-42.

Lewis, L. K. "Communicating change: Four cases of quality programs," *The Journal of Business Communication*, (37:2), 2000, pp. 128-155.

McDermott, R., and O'Dell, C. "Overcoming cultural barriers to sharing knowledge," *Journal of Knowledge Management*, (5:1), 2001, pp. 76-85.

McQuail, D., and Windahl, S. *Communication Models for the study of mass communications*, London, UK: Longman, 1981.

Messmer, M. "Improving your listening skills," *Management Accounting*, (79:9), Mar 1998, p. 14.

Okunoye, A. and Karsten, H. "Information technology infrastructure and knowledge management in sub-Saharan Africa: Research in Progress," in proceedings of the Second Annual Global Information Technology Management (GITM) World Conference, Dallas TX, USA, 2001.

Rogers, C. R., and Roethlisberger, F. J. "Barriers and gateways to communication," *Harvard Business Review*, (69:6), 1991, pp. 105-111.

Saxe, J. G. *The Blind Men and the Elephant; John Godfrey Saxe's version of the famous Indian legend*. New York: Whittlesey House, 1963.

Schramm, W. "How Communication Works," in *The Process and Effects of Mass Communication*, 6th ed., Wilbur Schramm, ed., Urbana, IL: University of Illinois Press, 1965, pp. 3-26.

Shannon, C. E. and Weaver, W. *The Mathematical Theory of Computation*, Urbana, IL: University of Illinois Press, 1947.

Thomas, D. M., and Watson, R. T. "Q-sorting and MIS research: A primer," *Communications of the Association for Information Systems*, 8, 2002, pp. 141-156.

Weiss, L. "Collection and connection: The anatomy of knowledge sharing in professional service firms," *Organization Development Journal*, (17:4), 1999, pp. 61-77.

Westmeyer, S. A., DiCioccio, R. L., and Rubin, R. B. "Appropriateness and effectiveness of communication channels in competent interpersonal communication," *Journal of Communications*, (48:3), 1998, pp. 27-36.