

THE OVERLOOKED ROLE OF LOCAL EXPERTS IN LEARNING TO USE TECHNOLOGY IN PUBLIC ORGANIZATIONS

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ABSTRACT

Information technology (IT) can enhance organizational productivity, but only if it is learned well by employees. Unfortunately, researchers and practitioners have largely neglected the informal social processes through which employees learn to use IT. This is a study of public employees who voluntarily help others to learn. The objective was to learn how these “local experts” assist co-workers and why they do so. It finds they are motivated by both extrinsic and intrinsic factors, including altruism. Local experts seek to enhance their organization’s productivity by taking the lead in learning new technology and helping others to master it. In doing so, they become sophisticated diagnosticians and trainers who are largely overlooked by top management. The findings of this study can be immediately applied by practitioners in nearly all organizations to help their local experts to enhance employees’ learning and productivity.

INTRODUCTION

Chester Barnard (1938) wrote that scholars and practitioners alike need to pay close attention to the social relations that employees create among themselves. Barnard argued that people necessarily create ‘informal organizations’ to share information and solve problems in ways that are essential to the success of their formal organizations. The findings of this study indicate that Barnard’s insights are especially relevant today. When public organizations adopt new information technology, their employees respond by asking helpful co-

workers to help them to learn how to use the technology effectively.

Information technology (IT) can enhance the productivity of governments, but only if employees learn to use it well. To a surprising degree, the processes through which employees learn to use IT have been largely neglected in the literature of IT and of public administration. This is a study of employees who voluntarily help others to learn. These key, but often overlooked, employees are the "local experts." *The research objective of this study is to provide empirical information from public organizations about how local experts train their coworkers and why they do so.* Our findings contribute to theory about how technology-related learning is accomplished in organizations. The findings are also relevant to any public administrators who wish to improve organizational training and position classification practices.

Information technology (IT) includes computer hardware, software, and related communications equipment. IT is a major contributor to the productivity of modern economies (Jorgenson, Ho, & Stiroh, 2007), but IT initiatives are costly and they often fail. Perhaps as much as a quarter of the federal government's annual spending of more than \$70 billion on IT could be "at risk" (GAO, 2006). State and local governments also undergo risks. In 2007, Florida's Chief Financial Officer stopped the procurement of a new financial system into which the state had sunk \$89 million (FDFS, 2007).

Successful implementation of new IT requires appropriate social behaviors, not just resolution of technical issues (Bondarouk & Ruel, 2008; Brown & Brudney, 2003). Organizations become more adept at adopting new technology when top managers facilitate learning (Cho, 2007) and when knowledge is shared among employees (Kim & Lee, 2006). Vonk, Geertman, and Schot (2007) reported that public employees use their immediate social networks to learn about new IT applications. Little is known, however, about how learning is accomplished within those social networks.

LITERATURE REVIEW

Learning must first be accomplished by individuals, in small groups, before it can be shared (Fry & Griswold, 2003). Given the importance of learning new technologies, it would seem likely that the immediate social contexts within which individual end users learn to use new technologies would have been extensively researched. Unfortunately, these learning processes have seldom been addressed in the information technology literature (Claver, Gonzales, & Llopis, 2000). We conducted an extensive review of the literature in public administration and found the same neglect of the topic.

The following is a summary of the literature that was utilized by the authors prior to conducting interviews as well as the literature that was subsequently used to help make sense of the findings that emerged from those interviews. The research method employed was qualitative interviews of forty persons, so it was not possible to statistically reject or accept hypotheses as is possible when using statistical research methods. Interpreting the findings of qualitative research involves what has been called 'sense making' which often requires accessing further literature subsequent to the conduct of field research (Weick, 1988 & 1995). This literature review, therefore, includes that which helped us frame the initial research expectations that guided our conduct of the interviews and the additional literature that was subsequently used to facilitate our efforts to organize and make sense of the findings.

Learning in Organizations

Learning, particularly the ways in which knowledge is attained and disseminated, has been of concern to organization theorists since Weber and especially since the seminal writings of James March and Herbert Simon (1958) and of Chris Argyris and Donald Schön (1978). Learning in organizations spans multiple levels -- from individuals to groups to overall organizations - and it has been linked to both productivity enhancement and success in adapting to environmental change (Dodson, 1993). The pioneer Russian psychologist Lev Vygotsky (1896–1934) believed that humans develop many of

their higher cognitive capacities through social interactions. Boreham and Morgan (2004) have argued that Vygotsky's concepts are fundamental to understanding how learning takes place within organizations.

Learning within organizations begins with the actions of those individuals who first acquire new knowledge. But organizational learning can be said to occur only when individuals' knowledge is shared within groups and subsequently with other groups (Wilson, Goodman, & Cronin, 2007). Dialogue is a fundamental element in the sharing of information among coworkers (Boreham & Morgan 2004). Without the sharing of knowledge, learning does not occur in smaller groups or in the larger organizations of which they are a part.

When knowledge is shared it becomes distributed among group members and makes organizations less vulnerable to knowledge loss due to employee turnover. Understanding how learning occurs and is shared within groups is essential in comprehending how learning occurs in organizations (Edmondson, 2002). It has been argued that facilitating learning within groups is an essential responsibility of human resource development practitioners (Silberstang & London, 2009).

Technology Acceptance and Adult Learning

New technology creates imperatives for learning to occur to enable adaptation and it also presents opportunities to enhance organizational performance. When new technology is introduced, group learning activities typically emerge almost immediately and coworkers can either enhance or impede technology acceptance (Bondarouk & Ruël, 2008; Gallivan, Spitler, & Koufaris, 2005). Vonk, Geertman, and Schot's (2007) study of geographical information systems (GIS) in public planning organizations revealed that some employees had, of their own accord, taken the initiative to learn the new technology and to facilitate its adoption and use among coworkers.

In a study of the acceptance of an expert system in a public agency, Berry, Berry and Foster (1998) found that managerial support and perceived ease of use positively influenced utilization. Support from the top and ease of use are variables that are commonly found in the "technology

acceptance” literature which traces its origins to a book by Fred D. Davis (1986). The technology acceptance perspective assumes that resistance to the adoption of new technology is likely and that scholars need to better understand why people decide to accept or reject it.

Unlike technology acceptance theory which presumes the likelihood of resistance to gaining new knowledge, adult learning theory presumes that adults are predisposed toward obtaining new knowledge (Knowles, 1984). In this, adult learning theory reflects the well-known “Theory Y” assumptions of Douglas McGregor (1960). Adults routinely make use of social relationships to obtain information, especially when learning IT applications (Sawchuk, 2003; Oppermann & Specht, 2006). Adult learning is “situated,” meaning that humans use their social contexts to extend their own mental capacities (Lave & Wenger, 1991). In situated learning contexts, the role played by those who possess and transmit knowledge to others is particularly important (Stein, 2001). In transmitting knowledge, information providers sometimes use diagnostic frameworks to tailor the training that they provide (Jahns, 1981; Lave & Wenger, 1991).

George, Iacono, and Kling (1995) found that learning about IT was enhanced where informal interactions were fostered, but learning lagged where informal communications were suppressed. Lags in learning can be costly as end users need assistance immediately when they encounter problems in using IT (Karuppan, 2000). Informal learning activities, especially learning from coworkers, have been found to be a primary means of learning to use IT in public organizations (Klay & Yu, 1991). An extensive study (Winter, Chudoba, & Gutek, 1997) concluded that an organization's support infrastructure and its provision of formal training were generally not associated with workers' knowledge of computers with one exception -- the presence of a "local resident expert."

Local Experts

Through comparative case studies of eleven American cities, Rocheleau (1988) found that the sharing activities of knowledgeable coworkers were critical to learning about IT.

Novice professionals, such as nurses, have been found to depend heavily on the assistance of ‘helpful others’ who are not formally assigned to be designated helpers (Eraut, et al., 2004). Two qualities seem to be especially important – possession of knowledge and a willingness to share it (Bakardjieva, 2005). Eason (1988) reported that employees prefer to go to knowledgeable coworkers than to professional IT staff persons because the coworkers better understand how to use the IT to accomplish assigned tasks.

Bondarouk’s (2006) detailed studies of IT learning in a hospital, an insurance company, and a university revealed that workers regularly consulted coworkers who were advanced users. Wu and Rocheleau (2001) surveyed end users in 8 private organizations and in 25 municipalities. Finding that obtaining help from knowledgeable peers was the most important method of learning, they recommended that managers should become aware of their ‘key users’ and support their informal training activities.

Advanced users who help others to learn about IT have been labeled as “super users,” “gurus,” “power users,” “local experts” and “key users.” We prefer to use the term “local expert” to emphasize their proximity. In a study of IT learning in various settings in a community in Scotland, Stewart (2007) found that adults regularly seek out others in their informal social networks who are trusted and who are willing to share their knowledge. The local experts, as he called them, need only have relative expertise, to know more than those whom they help. The local experts were among the first in their groups to purchase and experiment with IT. Stewart found that all of the local experts he interviewed saw themselves as playing such a role but that “... none of them set out to be experts; they found that their expertise became valuable to those around them after they had developed it for their own activities (p. 248).” Informal collaborative learning activities by computer users are ubiquitous (Eales, 2003). It was therefore expected that local experts would be, in a sense, ‘self-made.’

Research Expectation 1 – Local experts emerge informally in the public organizations in which they work.

Facilitating Training and Communication

Enterprise Resource Planning (ERP) is a process in which advanced software is used to integrate multiple parts of an organization. The goal is to enable information that is generated in one part of an organization to be readily accessed and utilized in any other part of the organization. Some research on implementing enterprise resource planning (ERP) systems has highlighted the importance of local experts as facilitators of training. Unfortunately efforts to develop and implement ERP systems frequently exceed cost estimates, fall behind, and often fail (Basoglu, Daim & Kerimoglu, 2007). Inadequate planning for learning by end users is a cause for failure in ERP initiatives (Al-Mashari, Al-Mudimigh, & Zairi, 2003). Kumar, Maheshwari and Kumar (2003) indicate that some organizations that have successfully implemented new ERP systems have identified their local experts, trained them first, and used the local experts to develop training approaches and materials for their coworkers. Chand, Hachey, Hunton, Owhoso and Vasudevan (2005) described how an aircraft parts manufacturing company successfully used some of its local experts to develop training materials for their peers. No one, however, has studied how local experts actually function in facilitating training. We expected that local experts would utilize their knowledge of co-workers when providing assistance to them.

Research Expectation 2 – Local experts function as training facilitators for fellow employees, using their knowledge of co-workers to tailor the assistance provided to fit the co-workers' specific needs and situations.

Poor communication is a prime cause of failure in implementing advanced IT applications (Motwani, Subramanian, & Gopalakrishna, 2005) and communications barriers between system developers and users are obstacles to IT success. It has been recommended that employees should be consulted in IT

development and training activities (Kim & Lee, 2006). In their study of ERP development in a Scandinavian accounting firm, Åsand and Mørch (2006) observed how local experts helped to span organizational boundaries and facilitate communication between IT developers and users. Volkoff, Elmes and Strong (2004) and Baskerville, Pawlowski and McLean (2000) have similarly described how some organizations identified and used local experts to work with system developers and inform coworkers. We therefore expected that local experts would sometimes play a boundary spanning role between users and IT developers.

Research Expectation 3 – Local experts sometimes function to communicate users’ concerns and perspectives with their organizations’ IT professionals.

The importance of local experts in facilitating IT learning was first recognized some two decades ago, so it would seem that they would have been well studied by now. Unfortunately that is not the case. With the exception of Stewart (2007) and Bakardjieva (2005) who interviewed local experts primarily in community settings, there seem to be no published studies based on actual observations and interviews of local experts. The local experts they studied were early adopters of IT, had generally positive attitudes about technology, were willing to help others, and were sufficiently knowledgeable to do so. No study has explicitly studied local experts’ motivations or identified the querying processes that local experts would presumably need to engage in to respond to users’ problems.

The best speculation regarding how local experts function comes from Winter, Chudoba and Gutek (1997). They conjectured that local experts develop relationships with end users that might enable them to tailor their responses to each user’s knowledge level. As colleagues who understand end users’ production processes and terminology, local experts might be well positioned to communicate solutions in terms that are familiar to the end users. One of the most venerable assertions in social science theory is that of time constraints and ‘satisficing,’ associated especially with Herbert Simon (1956). Providing help

to others can occupy a good part of local experts' work days (Rocheleau, 1988). Local experts have limited time in which to provide training assistance and they must accomplish their regularly assigned organizational tasks, therefore it was expected that they would satisfice.

Research Expectation 4 – Local experts satisfice in deciding how to respond to co-workers' requests for assistance, choosing responses that are sufficient but do not place greater demands on their time than is necessary.

Motivation

One of the tenets of psychology is that the motivation of human beings is multifaceted. Reviews of the technology acceptance literature have underscored the importance of both extrinsic and intrinsic motivation, but especially the latter (Venkatesh, 1999; Venkatesh, Morris, Davis, & Davis, 2003). Extrinsic motivation is present when a behavior is performed to attain a specific goal; intrinsic motivation is evidenced when performing a behavior is inherently satisfying. A cursory knowledge of human motivation, however, can lead to poorly conceived incentives in organizations. Using offers of promotions and financial rewards to foster competition between employees in an "up or out" manner can impair collaboration in the learning and use of IT (Orlikowski, 2000).

Psychologist Robert J. Vallerand's (1997) 'Hierarchical Model of Intrinsic and Extrinsic Motivation' proved to be heuristically useful in this study. Vallerand posits two categories of extrinsic motivation – 'identified regulation' refers to behaviors undertaken to achieve personal ends and 'external regulation' refers to social expectations and pressures placed on an individual. His model includes three categories of intrinsic motivation – knowledge, accomplishments, and stimulation. 'Knowledge' refers to the inherent satisfaction felt when someone has enhanced what they know. 'Accomplishments' refer to the inherent satisfaction felt when one has done something worthwhile. 'Stimulation' refers to the pleasurable

sensations or emotions that the performance of a behavior might rouse.

Two studies of on-line electronic ‘communities’ have looked at why some participants willingly provide assistance to others whom they do not know personally. Each concluded that one reason was altruism, that leading edge users tend to enjoy helping others (Wasko & Faraj, 2000; Jeppesen & Laursen, 2009). Survey research has indicated that public employees tend to score higher on altruism than do their private sector counterparts (Rainey, 1997; Brewer, 2003). Houston (2006) found that employees of public, and especially nonprofit, organizations are more likely to perform altruistic acts. Such research underscores that studying the motivations of public employees without being open to the possible existence of altruism would be incomplete.

Research Expectation 5 – Persons who become local experts are motivated to do so for multiple reasons, including altruism.

METHODOLOGY

Reputation was the criterion used to identify local experts (Volkoff, Elmes, & Strong, 2004). Messages were emailed, with official permission, to all employees of three state agencies and one mid sized city, asking people to identify the names of coworkers whom they might ask for assistance in learning about IT on the job. A total of 540 requests were e-mailed; 389 employees (72 %) responded and 111 names were identified. The ten most frequently mentioned employees from each organization, a total of 40, were interviewed using a semi-structured interview schedule.

The organizational and social contexts of the local experts were not well known to the researchers. Under such conditions, semi-structured interviews are an appropriate means to learn the stories of research subjects (Heracleous & Barrett, 2001; Bondarouk, 2006). Both the survey instrument and semi-structured interview schedule were pre-tested with employees on a university campus.

Each interview took approximately sixty to ninety minutes. Analyzing qualitative data begins with the transcription of interviews followed by the identification of key themes which, in turn, depends on the process of coding data (Smith & Glass, 1987). With consent, all conversations were recorded, transcribed verbatim, and then analyzed using thematic content analysis. The themes of local experts' 'stories' were organized around the familiar journalistic elements of "who, what, when, where and why." In short, the themes centered on who the local experts are, what they do, when and where they do it, and why they do what they do. The coding of transcribed data was independently done by three individuals.

Following Daniels' (1989) and Bailey's (1977) recommendations, a sample of ten interviews was randomly identified and scored by the three independent coders. The overall reliability for the ten interviews, using the formula recommended by Bakeman and Gottman (1997), was 89%. This procedure enabled rater reliability to be assessed on one-fourth of all interviews conducted, as recommended by Bailey (1977), and the results exceeded Bailey's recommended overall reliability level of 80% or better. The remaining interviews were then divided and rated independently by the raters.

Qualitative research necessarily involves interpretation. In the interpreting of interviews to discern findings, the authors jointly and individually reflected on the data from the perspective of their respective experiences. Each author has been a practitioner as well as a researcher. Tentative findings were discussed with others in formal and informal settings with encouragement given to suggest alternate interpretations.

FINDINGS

Informal Democratic Diversity

Most local experts interviewed did see themselves as key persons to whom others came for assistance (38 of 40; 95%). *None was assigned this role by their organization and no one indicated that they had intended to become local experts.* This finding is in line with our Research Expectation 1. As was the case with Stewart (2007), we found that no interviewee had

intended to become a local expert. The formal education of 38% (15) ended at high school, 22% (9) had either an AA or some college, and 38% (15) held one or more college degrees. Half (20; 50%) occupied clerical/secretarial positions, 40% (16) were professionals, and 10% (4) held managerial positions. They described a democratic process in which assistance routinely moves up and down hierarchies. Every respondent (40; 100%) reported assisting persons in clerical/secretarial positions. Most (33; 82.5%) provide assistance to professionals and the same number (33) reported helping supervisors and managers. Local experts in clerical/secretarial positions repeatedly told of assisting professionals and managers.

Multiple Roles Played

Interviewees' comments revealed that the local experts perform six distinct roles. All (40; 100%) local experts saw themselves as *trainers*, confirming the first part of Research Expectation 2. Almost all (37; 93%) said they saw themselves as *trouble shooters*, helping others to solve problems as they arise. About half (19; 48%) act as *liaisons* between their work groups and their organization's IT staff, somewhat confirming Research Expectation number 3. About a third (13; 33%) said they serve as *counselors* to coworkers, helping them to relieve stress. Slightly more than one quarter (11; 28%) are *advisers*, recommending additional formal training that fits the coworkers' knowledge levels and aspirations. In short, the roles of the local experts extend beyond just sharing knowledge about the tasks at hand. They also seek to help coworkers enhance their mental well-being and grow in knowledge and capabilities. In addition, some (7; 18%) see themselves as active *promoters* of technological innovation.

Episodic Demand

The local experts indicated that they are sought out whenever coworkers encounter hardware or, more likely, software application problems. Such episodes occur throughout the work year, but their frequency greatly increases immediately after formal training on new applications has been delivered. New applications bring new problems, requiring greater

employee engagement in learning. Even so, the local experts emphasized that the specific timing of requests for assistance is not predictable.

The position descriptions of only two of the local experts had been revised to include their training function. All were expected to fully perform all of their regularly assigned job tasks. Only six (15%) reported that their supervisors had made an adjustment in their regularly assigned workloads. Nevertheless, nearly all (37; 93%) reported that they try to respond promptly. They believe that responding swiftly reduces end users' stress and avoids work delays. Many (18; 45%) indicated that they sometimes have to prioritize requests to accomplish a pressing task of their own or lend a hand to another user first.

Sensitive, but Satisficing, Diagnosticians

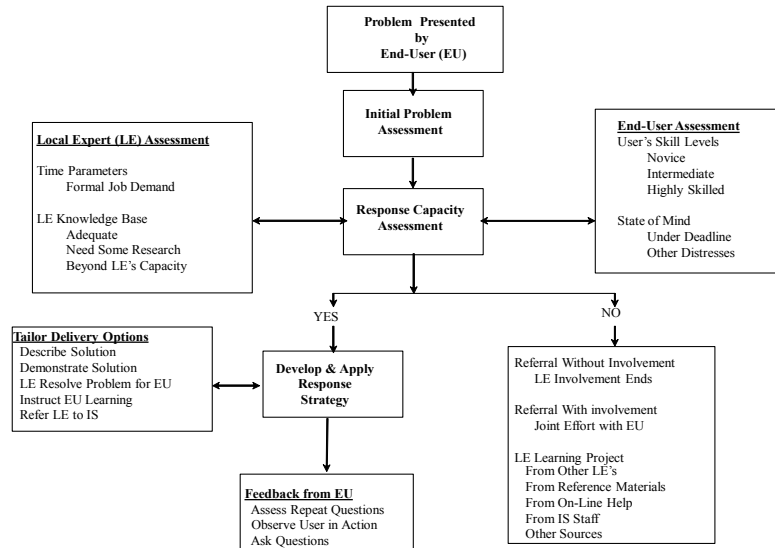
Semi-structured interviewing allows researchers to become aware of emergent patterns that they had not previously suspected. Dialogue is fundamental to organizational learning (Boreham & Morgan, 2004), so the local experts were asked to describe their conversations with end users. Assistance providers sometimes use diagnostic frameworks (Jahns, 1981; Lave & Wenger, 1991), but we did not expect to encounter the sophisticated diagnostic model that we found our interviewees to be using. In the course of conducting the interviews, it became evident that the local experts were describing a complex multi-stage diagnostic process that was in line with our Research Expectations numbers 2 and 4, but their process was more sophisticated than had been anticipated. To our great surprise, the local experts, forty distinct individuals from different organizations and varied educational backgrounds, were describing a single diagnostic model, not multiple diagnostic models.

That model is presented graphically in figure 1. The process begins when coworkers come to the local experts. No local expert reported visiting coworkers to seek problems. Coworkers usually come physically to the local expert's work station but they often use the telephone, especially if physically distant. Coworkers typically need immediate resolution to

problems that interrupt their task accomplishment, so they seldom use asynchronous communications such as email. When approached, local experts immediately engage in dialogue to ascertain the nature of the problem.

Having an on-going relationship with a coworker, the local expert already knows that person's skill level, so dialogue centers on learning the nature of the problem itself. Coworkers are asked to describe what steps they took on their own to remedy the problem. Interviewees repeatedly said they encourage coworkers to first try to resolve problems themselves. In this initial problem assessment phase, local experts ask questions to learn the particular technical aspects of the problem, as well as to ascertain the importance of the work interruption to the individual and unit. A work interruption that is more serious is given a higher priority for response. Some interviewees were concerned that work stoppages had occurred when they were absent. Local experts also gauge the emotional state of the coworker and respond differently when a coworker appears to be stressed.

Once they understand the particular problem, local experts then assess their own capacity for response. They especially consider the amount of time a response will take. Problems encountered by intermediate or advanced IT users might be resolved with brief suggestions. Similar problems encountered by novices might require lengthy interruptions from the local expert's regular tasks while he or she goes to the coworker's work station to assist in resolving the problem. Resolving novices' problems can be time consuming because the local experts indicated that they prefer to respond in a capacity building manner.

Figure 1 Diagnostic Model Used by Local Experts

Very few (5; 13%) reported ever performing a task for a coworker, but nearly half (18; 45%) reported demonstrating how to resolve problems. Dialogue is the primary means employed by the local experts. All but one (39; 98%) said they sometimes go to users' worksites where they can be "talked through" to a solution. The time spent by a local expert seems to be inversely related to the level of the coworker's knowledge. A request from a stressed novice receives high priority even though it is likely to be time consuming. Local experts also engage in self-reflection, evaluating how much time they can spend away from their own tasks and judging their own knowledge levels relative to the complexity of a problem. Most requests seem to be within their knowledge level but some requests trigger learning episodes by the local experts to expand their own knowledge.

When a local expert decides that they lack the time or knowledge to assist a user, they can choose to refer the user to another person and have no further involvement. They also

sometimes become co-learners, joining a user in making joint inquiries to others. When they need to learn more, the local experts engage in on-job experimentation, do additional reading on the job or at home, and consult their own “gurus.”

Local experts repeatedly described tailoring their responses to fit each coworker and the particular problem at hand. Their responses varied with the knowledge and mental state of the coworker, with the complexity of the particular problem, and with the local experts’ own knowledge and job demands. Local experts work to enhance the capacity of their coworkers to accomplish the organization’s purposes. No local expert described providing assistance for non-work related IT problems. They also notice patterns in the requests brought to them that indicate systemic organizational problems to be addressed.

What the local experts do fits the prescriptions of the training literature and adult learning theory very well. Adult learning theory emphasizes such things as facilitating learning in the context of specific problems, assessing learners’ abilities, designing instruction to fit specific situations, and enabling experiential learning and capacity building to take place (Knowles, 1984). Local experts engage in needs assessment, instructional design, development-oriented implementation, and evaluation. They begin by assessing a user’s needs and abilities, they provide individualized training for the user to implement, they often observe users as they follow the suggestions made by the local expert, and they regularly ask questions afterward. It was clear, from their seeking of feedback, that these public servants feel personally responsible for providing effective assistance. Previous research indicates that end users need training assistance on site at the moment they encounter a problem (Karuppan, 2000). Local experts are well positioned to fill that need.

The performance of individual local experts is likely to vary within the overall diagnostic model. For example, those who must devote more of their time to their own assigned job tasks might be quicker to refer a coworker to others. Some might be more adept at helping coworkers to relieve their stress. Highly knowledgeable local experts seem to refer coworkers to others

less often. Local experts who are physically distant from a coworker are less likely to go to his or her job site to help resolve a problem. Nevertheless, all described working within the diagnostic model described here. None described using an alternate model.

Why do the local experts interviewed use only this one diagnostic model? If one assumes that the local experts are adults who seek to enhance personal and organizational capacity and to accomplish unit work tasks, rather than shirk them, then the decision sequences described do have a clear and understandable logic to them. In fact, the model described could only exist if these public employees exemplify McGregor's "theory Y" assumptions (1960). If these employees were inclined to shirk responsibilities and operate solely on self-interest, they would decline to assist coworkers. They are not paid more to do what they do. Self-interest, though, is evident. By adopting a developmentally oriented approach, the local experts enhance coworkers' capacities, thereby reducing the likelihood that the coworkers will interrupt them in the future for the same problems. No local expert interviewed indicated in any way that they promoted dependency on themselves.

What emerged from the interviews was a description of a sophisticated diagnostic model that none of the local experts had learned in a classroom. The one model emerged from the situations in which each found themselves. We believe that part of the answer lies in understanding who the local experts are. Not one interviewee was hired by their organization to function as a local expert. They are self created. Each one individually decided to learn about IT and each one individually decided to respond favorably to coworkers' requests for assistance. Having made the decision to assist others, the local experts found themselves in new relational contexts of sometimes considerable complexity. Further, the decisions of coworkers to come to them suggest that the experts are viewed as both trustworthy and socially responsive.

Among the most complex cognitive functions developed by humans are those that help them to understand a social context in order to fashion appropriate behavioral strategies for operating within it. Vygotsky especially emphasized the

developmental importance of what a person does for others. He wrote, “The individual develops into what he/she is through what he/she produces for others (Vygotsky, 1988, p. 72).” Having made the decision to ‘produce’ assistance to others, the local experts then found themselves in situations that required them to develop diagnostic competence.

The demands of their own job require local experts to ration their time. All have limited time and knowledge, so the local experts must sometimes refer a coworker elsewhere. Local experts must occasionally initiate personal learning projects to sustain their ability to provide assistance. Having chosen to become helpers, yet faced with time and cognitive limits, they had to develop decision routines to facilitate the providing of assistance. Responding to the “logic” of their situations, they became sophisticated diagnosticians. The common elements of their situations led forty distinct individuals to develop a personal diagnostic model that is strikingly similar to that developed by each of the others.

Motivation

There are disadvantages to being a local expert. All but one (39; 98%) said that helping others reduces the time available to accomplish their regularly assigned job tasks. Most (34; 85%) received no reduction in their regular tasks. Being a local expert is a self imposed additional duty. A third (13; 33%) said that being a local expert occupied between a quarter to one half of their time. Why, then, do they commit themselves voluntarily to be local experts?

The path to becoming a local expert seems to begin with an innate curiosity and desire to explore new things. Without prompting by the researchers, a majority (26; 65%) indicated that they enjoy learning new things. The position descriptions of only two of the forty recognize that they provide IT learning assistance to others; none receive higher salaries for serving as local experts. Earning more in their current positions is not probable, but local experts do expect they will be less likely to be laid off and perhaps more likely to earn advancement.

Vallerand’s (1997) typology, discussed in the literature review above, includes illustrative statements that subjects

typically make to reveal the presence of a particular type of motivation. Comments made by the interviewees fell into all five categories of Vallerand's typology. Illustrative comments made by the local experts who were interviewed are presented in Appendix A. Many of the statements made by the local experts could readily be categorized using Vallerand's five categories, but some could not.

Interviewees repeatedly said, in numerous ways, that they found the act of helping others to be an inherently pleasing thing to do. The *Merriam-Webster Dictionary* (2015) defines "altruism" as "unselfish regard or devotion to the welfare of others." That definition fits well the nature of the interviewees' comments that did not fit Vallerand's model. Consequently, we added a category of intrinsic motivation called "altruism." With that addition, it became possible to readily categorize all comments made by the interviewees that related to their reasons for being local experts.

The local experts give their time to others -- even though the likelihood of financial reward is remote and doing so leaves them with less time to accomplish their assigned tasks -- because the act of being of service to others is intrinsically rewarding. Further research, though, will be needed to identify whether local experts in public (or other) organizations are more altruistic than their coworkers. Our research suggests that the presence of altruism facilitates organizational learning about new technology. Without altruism, we suspect these local experts would have been less likely to have come forth to be of service to their coworkers.

One of the clearest findings of this study is that Research Expectation 5 was affirmed; the motives of local experts are multiple and intertwined. All motivational categories posited by Vallerand, as well as altruism, were repeatedly evidenced by the local experts. It would clearly be a mistake to presume simplistic motivational patterns in a process as complex as the emergence of local experts in an organization.

CONCLUSIONS AND RECOMMENDATIONS

In this study, all research expectations were met but the findings went well beyond the researchers' expectations in ways that are of theoretical importance. This is the first study, in public organizations or elsewhere, to look in detail at the motivations of local experts. As expected, it found the presence of several motivators, but altruism seems to be especially important. It is also the first study to discover the presence of a sophisticated diagnostic framework that local experts' use in their provision of training. Future research on learning in organizations should inquire into whether such diagnostic frameworks are being created and used in other settings as well as investigate the importance of altruism as a motivator that seems to facilitate organizational learning.

The findings, especially that local experts provide individually tailored training assistance in ways recommended by adult learning theorists, have implications for any administrators that hope to use new technology to improve productivity. Both authors of this study are experienced administrators and we have observed that employees often have opinions on how to improve organizational training. We, therefore, asked the local experts to share their thoughts on how their organizations might improve formal training. Their ideas helped to frame the recommendations which follow.

Local experts are careful facilitators of learning, yet they do so largely outside formal hierarchical structures. Their insights can enhance the development and implementation of new IT systems, yet careless efforts to induce them through material rewards could lessen the efficacy of the intrinsic satisfaction that motivates them to a considerable degree. Some external rewards, such as social approval, can reinforce behaviors that begin from intrinsic motivations, while rewards that are associated with efforts to control the behaviors of employees can squelch intrinsic motivation (Vallerand, 1997). Using incentives, such as promotions, that foster competition between employees can impair collaboration in the learning and use of IT (Orlikowski, 2000). Practitioners and researchers alike need to explore how organizations might encourage local experts

to come forth and offer their services without lessening their intrinsic satisfactions.

Simply put, local experts have been ‘off the radar scope’ of both administrators and researchers. The conditions that are conducive to the emergence and effectiveness of local experts need to be further studied. The leaders of the organizations studied in this research could clearly do more to facilitate their local experts. Their supervisors were generally (though not always) supportive of their actions, but seldom adjusted their work loads. Top management was mostly unaware of the existence of the local experts in their organizations. *Public administrators, present and future, need to learn that productivity from IT is linked to the social processes of learning in organizations.* The HRM staff members of the organizations studied, especially those who write position descriptions and those who were responsible for training, were generally oblivious to the existence of the local experts who were interviewed. We recommend that HRM staffs be trained to include local experts’ services in job descriptions, thereby giving individual recognition as well as creating better inventories of the learning activities that actually occur in public organizations.

Kim and Lee (2006) recommend that leaders should recognize and reward those who facilitate knowledge sharing. We concur but recommend caution in doing so. In one organization we studied, the IT staff initiated a recognition process in which some local experts were designated “super users.” Though they seemed appreciative of being recognized, some of the identified local experts felt that the recognition process was an effort to increase their own workloads, while decreasing that of the IT staff members. Local experts have voluntarily and willingly accepted additional workloads, but care is needed not to violate their sense of fairness regarding what is expected of them.

Local experts perform in complex social settings that need to be better understood, but their emergence as local experts is due to individual attributes. Their cognitive abilities and curiosity entice them to learn new technology earlier than their counterparts. They become sensitive diagnosticians of others’ situations and needs. Local experts, therefore, should be

studied from both psychological and sociological perspectives – the social setting that creates a need for what they do and the psychological attributes that give rise to their becoming who they are. Further research might help organizations to better recruit future local experts and to better support those whom they have. As indicated in the literature review, the importance of ‘helpful others’ has been noted in organizational situations other than those in which IT is central (Eraut et al., 2004). It has been nearly eight decades since Chester Barnard encouraged researchers to study the informal social contexts of learning and problem solving in organizations. The time is long overdue for researchers to pay more attention to those employees who help others.

Local experts can help improve both systems development and training for advanced IT systems (e.g. Baskerville, Pawlowski, & McLean, 2000; Chand, et al., 2005). Local experts gain valuable insights into the nature of emergent and systemic problems and they work actively to create networks of persons seeking solutions to problems. Our interviewees participated in problem solving networks within and beyond their organizations. How local experts help create these networks has largely been ignored by researchers. Learning more about the networking activities of local experts might enable organizations to facilitate learning and lessen IT system failures.

Kim and Lee (2006) recommended that employees should be involved in the design of both system applications and training strategies. The local experts who were interviewed indicated that they are not usually consulted about new technology applications. Some interviewees believed they could provide useful input to applications design. We also found that the local experts had independently developed very similar ideas for improving training. The local experts repeatedly recommended an iterative “train the trainer” strategy. They have observed that too much formal training tends to be provided in one sitting. They recommended that employees not undergo too much formal training at one time and that the local experts be the first to be trained so that they might be better prepared to provide follow-up support on site to their coworkers.

Local experts “network” to promote learning and problem solving. They provide tailored training on site, as needed, to enhance their organizations’ uses of IT. Adequate justification, therefore, exists for leaders to explore how to better utilize these key employees in systems design and training. Little is known about the networking activities of local experts and even less is known about what contributions they might make to systems design. Both topics seem ripe for future research. Thanks to our interviewees, more is now known about the diagnostic and training activities of local experts, but they need to be studied much more extensively in multiple settings. In closing, we offer these words of advice to practitioners: if you want to promote the activities of local experts in your organizations, promote the creation of organization-wide learning cultures and take care not to inadvertently overburden your emergent local experts or squelch their intrinsic motivation, especially their altruism.

APPENDIX A. Motivation: Why Local Experts Perform their Services

Intrinsic Motivation – Knowledge:

“One thing is that I learn a lot from helping others, and sometimes they teach me by going back to the reference and showing me what they have done.”

“Any time you can help someone else, you are also learning something yourself.”

“If I do not know the answer then I try to facilitate getting the answer for them and we both learn something. So I also look at that as an opportunity to learn more.

Intrinsic Motivation – Accomplishments:

“I like technology. It is a challenge.”

“I like the challenge, and I do not like to sound stupid when people come and ask me questions.”

“I am one of those types of people that, I just, if there is something I am interested in and it is a challenge, I want to be able to do it.”

Intrinsic Motivation – Stimulation:

“I enjoy computers, they are fun.”

“I like working on the computer, I like to experiment with it.”

“I enjoy it; initially the technology was fascinating, then it became apparent that the future lies in computers.”

Intrinsic Motivation – Altruism:

“I love working with associates on computers, one-on-one. It makes me feel good to see I can help somebody.”

“If you happen to know something and you can allow somebody who is searching for something, to get them closer to what they are seeking, it is a very happy feeling.”

“Its part of my make up to try to make things easy for other people, I mean that is just the type of person I am. I hate to see anybody getting so overwhelmed with the computer that, if I can fix it or if I can help them and make it so that they understand, then I enjoy doing that.”

Extrinsic Motivation -- Personal advancement:

“You know these days, if you are not good in computers, it will be difficult to find employment. Career, yes, you can say it is one of my motivations.

“Computers are the wave of the future and the more you know about computers the more chance you have for advancement and job security.”

“Since computers have always fascinated me, so I have worked very hard to be knowledgeable, from a very selfish stand point, so that in times of troubled water I will not get swept over the edge.”

Extrinsic Motivation -- Social expectations:

“Those people are coming to you because they feel comfortable coming to you, and if they are asking your help, then you ought to oblige.”

“I would like to maintain my reputation, so I actively look into information about new programs coming up, just for that reason,

just so I may be one step ahead, and I will be able to answer most questions. It is definitely a motivational factor.”

“If you enjoy the fact that people come to you, and you like that recognition by your peers and co-workers, and if you get to a point where you cannot answer their questions, they will stop asking you.”

Multiple motives present:

“Initially it was just I was fascinated by computers. I would say, it will probably help me in getting a better job whenever I decide to leave this place. But mostly, I just love computers. I like the challenge of learning new things.”

“I just am curious. I enjoy computers, they are fun. Of course I also think my computer skills will provide me some advancement opportunities.”

“Enjoyment, career opportunity. It has given me the opportunity to rise within the department. It also gives you greater self-worth in that you’ve got these people coming to you and you are helping them. It is like a power thing somewhat.”

Professionally, you are staying on top of new applications and new technology and personally, it does enhance your social standing in the team as being a valuable resource.

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