

Informed Systems implementation

4

4.1 Organization description

Built in 1976, the Auraria Library is a centralized resource of information and expertise serving three institutions of higher education on the Auraria Campus in the heart of downtown Denver, Colorado, USA. The only such multi-institutional academic library in the nation, it currently houses approximately 650,000 print books; provides access to 140,000 e-books, 60,000 e-journals, and 280 million electronic resource records; and maintains 580 journal and newspaper subscriptions, 350 database subscriptions, and a film and videotape collection of more than 22,000 titles.

These resources serve the students and faculty of the University of Colorado Denver (CU Denver), the Metropolitan State University of Denver, and the Community College of Denver, with a combined enrollment of 54,000 students representing 17% of all college students in the State of Colorado. At each of the schools, populations of “non-traditional” students range from 25% to more than 50%. Whether minority, low-income, first-generation, married with family, splitting time between work and school, resuming an interrupted education, separating from the military, or possibly all of the above, students find that the Auraria Campus institutions are experienced at enabling them to succeed. The Library also actively collaborates with other major research libraries in Colorado to advance discovery and access to unique local holdings, digitized and hosted in institutional repository environments that, collectively, enhance the scope of Colorado collections.

4.2 Organizational reinvention

Across the globe, changes are disrupting traditional practices of information and knowledge professionals throughout the scholarly ecosystem (Somerville, Schader, & Sack, 2012; Somerville & Conrad, 2014). Accelerated diffusion of Internet usage is continuing to challenge traditional library usage patterns and associated workplace priorities, outcomes, and processes. In addition to these global pressures, the Auraria Library was experiencing the national recession further aggravated by regional economic depression and a “print to digital” migration mandate when I assumed the role of Library Director in 2008. These combined global and local changes provided the impetus for comprehensive organizational renewal to satisfy the pervasive need in contemporary organizations for decentralized application of expert skills and understanding.

To create an enabling infrastructure, a collaborative design initiative advanced reinvention of structures, processes, services, and roles throughout the organization, with emphasis on distinctive social, relational, and interactive aspects of workplace

learning. Fostered by appreciative inquiry, enabled by social learning, fortified by systems thinking, and animated by shared leadership, the redesign initiative aimed to advance informed learning, thereby applying theoretical conceptions to transformation of a real-world workplace environment.

Earlier applied research initiatives had demonstrated that advancement of the use of information to learn required furthering information exchange, decision-making, and knowledge creation systems through purposeful organizational redesign. Therefore, the reinvention of organizational culture, collaborative processes, and workplace outcomes intentionally furthered these organizational elements. Changes were firmly grounded in a working understanding of Informed Learning theory and associated professional practices, reflective of prioritization of “using information to learn” (Bruce, 2008) in the workplace, fortified by continuing voracious reading of literatures relevant to the comprehensive organizational redesign initiatives discussed below.

4.3 Organizational learning

To create learning aspirations and learning systems, organizational learning was initiated through “appreciative inquiry” (Pan & Howard, 2010; Somerville & Farner, 2012) and furthered by human-centered systems design processes (Mirijamdotter, 2010; Somerville & Howard, 2010). Intentional, incremental building of conditions necessary for transformative “information experiences” (Somerville & Mirijamdotter, 2014a) in an emergent organizational learning environment supported progressive understanding of “problematical situations” through “opportunity for all participants to be part of the enquiry rather than the objects of the enquiry” (Stowell, 2013) when “finding out” about shared concerns. The phrase “problematical situation” intentionally contrasts informed learning, which describes a continual process, with problem solving, which assumes that there are discrete problems that can be solved once and forever. Therefore, in the spirit of informed learning, “research for change” (Reed, 2007a) within enabling learning systems aimed to advance collective thinking about situations so that concerted action could be taken to bring about local improvements. Mindful of learning, enhancements in professional practices and advancements in topical understanding typically occurred as well.

According to Checkland and Poulter (2006), “The complexity of problematical situations in real life stems from the fact that not only are they never static, they also contain multiple interacting perceptions of reality. This comes about because different people have different taken-as-given (and often unexamined) assumptions about the world. This causes them to see it in a particular way.” Within libraries, this can be expressed as employees seeing the library as a repository of established knowledge or, in contrast, as an environment for knowledge creation. Differing viewpoints produce different assumptions about the nature of the library institution and about the mission of library professionals. In other words, people have different worldviews, “mental and social constructions derived via social interaction” (Guba & Lincoln, 1989). Therefore, informed learning experiences have to include analysis at a level that allows worldviews to be surfaced and examined.

As examples below illustrate, even fixed worldviews can change over time because “All problematical situations, as well as containing different worldviews, have a second important characteristic. They always contain people who are working purposefully, with intention, not simply acting by instinct or randomly thrashing about—though there is always plenty of that too in human affairs” (Checkland & Poulter, 2006). Recognition of the existence of conflicting worldviews and the ubiquity of purposeful actions can inform the exploration of problematical situations through a process of inquiry which, through social learning (Lave & Wenger, 1991), leads to discovery and insight for taking “action to improve” professional practices and real situations. When locally contextualized by values, experiences, and purposes, iterative learning cycles identify changes that are both arguably desirable and also culturally feasible for the people in a particular situation with its particular history, culture and politics. That is to say, this approach to action reflects “a process of finding versions of the to-be-changed situation which different people with conflicting worldviews could nevertheless *live with*” (Checkland & Poulter, 2006).

4.4 Systems thinking

Rethinking together can produce accommodated agreements if four conditions, fundamental to “systems thinking,” are met. These conditions recognize that “the underpinning abstract concept is that of a system as an adaptive whole, which can survive as its environment may change and deliver shocks to it. In such a whole, each functional part will be properly linked to others, and appropriate information will be continuously available to enable adaption to take place in response to the monitoring of performance” (Checkland, 2012).

First, any entity called a “system” may also contain within itself functional sub-systems, and may itself, as a whole, be a functional part of a wider system. For example, an academic library is comprised of units—such as technical, public, technology, and administrative services—and is also an integral part of a higher education institution.

Second, to achieve adaption to change, processes of communication involving both the system and its environment will enable performance to be monitored so that a decision to adapt or not can be taken. In the Auraria Library, purposeful communication systems were co-designed to ensure ready access to data and information, with accompanying processes for dialog and reflection. Elsewhere, such processes are referred to as information practices but here these processes are referred to as professional practices because the intentional conversion of data and information to knowledge and wisdom oftentimes requires other professional knowledge bases, including Soft Systems Methodology (SSM) design tools from systems sciences and charette (workshop) design practices from architecture and landscape architecture.

Third, “if action to adapt is to be taken, the system will have to have available a number of possible control processes (responses to the shocks from the environment and internal failure), which can be appropriately activated to bring about change” (Checkland, 2012). In this instance, a thoughtfully articulated structure for shared leadership, including interactive evaluation, decision-making, and strategic

planning, ensures nimble responsiveness to changing conditions. A workplace culture of evidence-based decision-making, animated and informed by participatory action research studies, serves to further appreciative inquiry possibilities.

Fourth, definable “emergent properties” that characterize the particular system, and which are a result of the interactions between functional sub-systems, must be active. In the case of Auraria Library, adoption of Informed Learning theory ensures attention to learning. The workplace was further enabled for learning by theories for co-designed knowledge systems and professional practices described by both Bruce and Checkland. Within these intersecting theoretical frameworks, these questions provided points of departure: “What information literacy experiences do we want to facilitate or make possible?” and “What information and learning experiences are vital to furthering our own professional work?” (Bruce, 2013).

In the Auraria Library environment, appreciative inquiry, shared leadership, co-design, and systems thinking provided the means to promote discovery. The new library recognizes that academic libraries are a part of a rapidly changing higher education landscape that necessitates active exploration—and responsive transformation—of traditional resource, service, and facility assumptions, with and for campus stakeholders. These theories and elements are described in the following sections, with the aim of ensuring “recoverability” (Checkland, 2012) of the whole course of thinking about this organizational transformation by any interested outsiders.

4.5 Organizational readiness

Assuming the role of University Librarian and Library Director at the University of Colorado Denver provided me with an opportunity to serve as thought leader and knowledge enabler by expressing the lessons learned from previous organizational settings. Earlier research projects had underscored the importance of such seemingly disparate factors as worldview paradigms, shared vision, cultural norms, professional practices, metanarrative stories, and performance behaviors used in determining critical information sources and workplace capabilities required, both for the collective learning process and for the organizational learning system. In choosing to adopt an informed learning orientation, I drew from my prior experience, which illustrated that successful adoption requires leadership to consistently focus on the relationship between the organization’s communication systems and information experiences. Ultimately, this focus provides understanding of what is being learned about the organization and how this learning occurs as a result of those experiences. Therefore, I chose to complement Bruce’s Informed Learning theory with Checkland’s SSM tools to co-design organizational systems to enable knowledge creation, as explicated by Nonaka.

The fundamental aim of the redesign process was to cultivate “information resilient workers” (Lloyd, 2013), which enables nimble workplace responsiveness, even amidst considerable disequilibrium and disruption of “the way we do things here.” I anticipated that, in a synergistic fashion, employees’ enhanced information competences would both build upon and also further reinvent relationships among information, technology, and people. Project highlights below illustrate various strategies

intentionally applied to introduce ideas that extended established but outdated worldviews and their associated assumptions. In addition, the redesign initiative sought to overcome pervasive deficit thinking and silo-ed decision-making. Along the way, entrenched paradigms of librarian as gatekeeper and library as warehouse were challenged and transformed, as they disabled movement forward amidst disintermediated searching and disruptive technologies.

4.6 Reinvention genesis

Since intentions, fortified by enabling structures and processes, are quite influential in determining workplace character, the initial priorities of the capacity building initiative focused on collaborative design and inclusive construction of knowledge that enabled systems to ensure progressive accomplishment of newly envisioned initiatives. From my earlier experiences, I understood the importance of involving all interested employees in the creation of aspirational systems for communication, planning, and governance. While these directions were initiated from “the top” based on action research results in previous institutions, the Informed Systems Approach organically gained “bottom up” adoption and adaption within this holistically co-designed and systems-enabled learning organization.

To begin, I conducted one-on-one interviews with 85 employees, using questions based in Appreciative Inquiry (Whitney & Trosten-Bloom, 2003; Sullivan, 2004). This approach to inquiry recognizes and affirms past and present strengths, successes, and potentials. It invites discussants to perceive that which gives life—such as health, vitality, and excellence—to living systems. By encouraging exploration and discovery, I signaled my openness to seeing new potentials and possibilities and invited others to do so also. I also initiated a coevolutionary search for the best in people and in our organization, as well as the world around us, in the belief that, over time and with practice, this would strengthen workplace capacity to apprehend, anticipate, and heighten positive potential and co-create a shared vision of valued and possible futures.

Thought questions presented in one-on-one meetings and group discussion included these “work life” inquiries, which increasingly explored employee “experience”:

Think of a time when you felt especially creative. Describe what you were doing, what you were thinking, and what you were feeling.

Describe a peak experience in your professional work. What was it about your situation, organization, colleagues, or yourself that enabled this to occur?

Recall a situation in this library when you worked well as a member of a team. Describe this experience. How did you feel? What made this possible?

Recall a successful partnership-like experience outside the library with university faculty or staff. Describe this experience. How did you feel? What made this possible?

Describe a leader who has influenced you. What did that person do? How did that person interact with you? Describe some specific instances in which you experienced this influence.

What are the three or four most important aspirations for the future of the library?

What are the key components for its vision?

In addition to discovering individual dreams, strengths, and aspirations, I was able to utilize the knowledge gained through these experiences to identify the individuals best suited to become Associate Directors. These individuals then conducted similar interviews with employees in their newly constituted units, asking “What is your greatest contribution to this organization?” and, relatedly, “What would you like to contribute to the Library in the future?” Results from these appreciative inquiry sessions clarified the variations in employee expertise and aspiration. In addition, “conversations about the ‘best of what is’ currently and ‘what could be’ in the future provided a foundation for organizational revitalization” (Pan & Howard, 2009a). As a consequence, a significant number of voluntary staffing reassignments were made, and the Associate Directors and I learned to work together to both build their own new units and also develop a big picture appreciation of the whole enterprise. In learning to see the potential of enterprise-level for “working together” (Somerville, 2009), formal organizational leaders learned both to discern the parts in the whole and also the relationship of parts to the whole. They also learned to see those parts and the whole in new ways.

As the following sections will illustrate, an early Appreciative Inquiry intervention served to reinterpret predominant deficit thinking and activate possibility thinking, which assisted employees in learning through a new lens. Progressively, they began to see that the whole and its constituent parts are adaptive. In addition, new professional practices based in evidence-based decision-making produced recognition that academic libraries need to provide the facilities, resources, and services most valued by stakeholders, rather than what employees desire to offer, or believe without analysis that present or potential constituencies require. Therefore, workplace structures and decision-making processes must ensure action-oriented and forward thinking movement toward organizational outcomes expressive of shared vision and enabled by learning systems.

4.7 Participatory systems design

A series of workshops conducted at the Auraria Library in March 2009 by Visiting Research Scholar Anita Mirijamdotter aimed to further creation of an evidence-based organizational culture grounded in shared leadership principles and fortified by reflective decision-making and strategic planning practices. This focus emerged from a previous workshop, facilitated by organizational development consultant Maureen Sullivan in November 2008. In this working session, participants identified desirable features for organizational communication, decision-making, and strategic planning systems within the larger context of shared leadership. Core issues included the need to organize systems for receiving and sending communications, identify what is important to know within an organizational context, and select appropriate tools to achieve desired communication outcomes. (For more information, see Attachment 4.1.)

Over the course of 3 days, Mirijamdotter delivered workshops that built on employees’ prior understanding, following the SSM learning process (Checkland & Poulter, 2006).

Workshop participants first analyzed existing communication channels, including the benefits for each, as well as current structures, processes, and purposes of organizational systems. During dialog and reflection, employees indicated a general preference for face-to-face forms of interaction that permit more personal, direct, and nuanced communication while conversing, deciding, and planning. Real-time interactions were also recognized as most supportive of informed learning, which depends on social exchange for “sense making.” However, workshop participants noted that it is difficult—and sometimes impossible—to schedule large group face-to-face meetings, which necessitates co-creation of vibrant virtual learning environments.

During the workshops, Mirijamdotter guided participants from surfacing general observations about characteristics of various communications channels in the current environment to identifying design characteristics for ideal communications, decision-making, and planning systems. Since ideal systems must satisfy shared needs, she also elicited shared concerns about problematical situations. For workshop participants, these included: to inform oneself and inform others; practice collaborative evidence-based decision-making; avoid duplication of effort; ensure team accountability; solve technological problems; share “big picture” professional frameworks; and disseminate organizational policies and procedures.

In moving from needs finding to system designing, Mirijamdotter employed the SSM “rich picture” tool to elicit mental models from small groups. She thereby created an intentional collective information experience that used information to learn (Somerville & Mirijamdotter, 2014b). The information-focused and learning intensive nature of various SSM tools and techniques guide action research cycles, in which participants address perceived problematical situations. As they explore situations through the lenses of diverse worldviews in a workplace culture rich in dialog and reflection opportunities, participants can find negotiated accommodations that enable collective action to improve. As isolated “learning in action” activities evolve into more widespread “collaborative evidence-based information practice,” persistent learning can catalyze discoveries that support adaption and, ultimately, transformation, as employees learn to “act wisely” (Rowley & Gibbs, 2008).

4.8 Shared leadership

In order to achieve this potential, the long-standing practice of working in isolation had to be transformed into working together collaboratively through “shared leadership” (Cawthorne, 2010; Pearce & Conger, 2003). (For more information, see Attachment 4.2.) Thus, collaborative evidence-based decision-making fortified by appreciative inquiry-based research (Reed, 2007b) and reflective dialog practices was introduced into the workplace. Organization-wide understanding was promoted through active involvement of a newly constituted Shared Leadership Team (SLT), composed of representatives from all levels across the organization, which assumed an oversight role. Monthly library-wide open forums ensured easy access to decision-making processes and resultant outcomes, as well as organization-wide discussion of and reflection on

implications. In these ways, intentional information-focused learning experiences simultaneously offered real-world practice exercising the new cultural values of shared leadership, appreciative inquiry, and organizational learning.

These early experiences also exercised the co-designed communication and planning system built to further organizational learning. When considered holistically, the system consists of both human and technology parts. Reflective of the former, newly constituted committees, task forces, and work groups began to routinely publish meeting outcomes on the new organizational intranet. Since dialog and reflection were deemed essential to evolving collaborative evidence-based information practices, a system of regular face-to-face meetings further enabled making decisions at the lowest appropriate level and leading “from wherever you are in the organization.” “This shared leadership approach moved decision-making beyond organizational hierarchies to distribute influence and authority throughout the workplace, in recognition that organizational success relies upon individuals, teams, departments, and divisions working collaboratively, cross-functionally and across hierarchies” (Pan & Howard, 2009b).

These foundational experiences promoted shared learning through intentional use of information to learn within a co-designed infrastructure for taking action to improve. (For more information about “actions to improve” orchestrated by the SLT, see Attachment 4.3.) Six years later, shared professional practices include collective reflection on, and refinement of information resources, collaboration essentials, and systems functionalities. Interactive evaluation and collaborative redesign activities purposefully develop staff capabilities to further decision-making and advance continuous improvements. Throughout, purposeful connections and sustainable relationships are cultivated among individuals and information within a multi-level systems-based environment for workplace exploration and social learning. The characteristics of the learning environment, reinforced by the social process of defining those elements, underscored “the social nature of using information to learn” (Bruce, 2008) and encouraged “social collaboration or interdependence between colleagues rather than emphasis on individual capability” (Bruce, 2008).

4.9 Shared Leadership Team

The accomplishments of the SLT illustrate the efficacy of distributed leadership and governance. Significantly, despite its short 9-month history in March 2009, during a workshop facilitated by Mirijamdotter, members expressed shared appreciation for the potential of shared leadership and common agreement on the role of this organizational oversight group. They understood that, given the breadth and depth of the SLT charge, members are recruited from across the organization to ensure rich representation from functional unit perspectives, both among formally designated leaders (on the organizational chart) as well as informal thought leaders, knowledge enablers, boundary spanners, and culture shapers throughout the organization. During the workshop, the SLT produced visual renderings (or “rich pictures”) illustrating various aspects of ideal organizational systems (technology and human), including direct and indirect relationships among cross-functional units.

SLT members' "rich pictures" represented a workplace environment of dialog and reflection that provided sufficient time for fruitful discussion enabled by constructive "meaning making" behaviors. The renderings acknowledged the efficacy of inclusive action research processes for addressing perceived problematical situations. Initially, concerns focused on identifying ideal modes of communication for shared leadership through informed learning grounded in effective information experiences which demonstrate that "It's possible to establish shared priorities" (Mirijamdotter, 2009). Over time and with practice, shared experiences further corroborated that no matter what the previous history, every system can be altered and invented, which suggests that "if organizations are constructed, they can be reconstructed" (Norum, 2001). It follows that leadership is responsible for design of organizations, processes, and learning environments to further individual and organizational learning (Mirijamdotter, 2010). (For more information, see the final report, Attachment 4.4.)

After Mirijamdotter's workshops, the process, outcomes, and aspirations of SLT meetings continued to evolve with the intention of more deliberately creating shared information experiences in which disciplinary (and transdisciplinary) questions inform, and are informed by, evolving professional practices. For example, agendas are collectively constructed and centrally posted in advance of meetings. Agenda items are identified as information, with the aim of encouraging dialog and reflection, or action, with the intention to follow dialog and reflection with decision-making to inform action taking. Library meeting rooms have been equipped with laptops and monitors, permitting simultaneous note taking that support collective sense making because minutes are read and reviewed, before publication on the intranet, at the conclusion of each meeting. To ensure organization-wide benefit, SLT minutes are also regularly discussed in various face-to-face meetings to ensure ample dialog and reflection on organizational governance outcomes.

In combination, agenda building, meeting minutes, and dissemination strategies constitute a designed organizational learning system, comprised of humans, technology, and learning (Bruce, 2012, 2013), which fulfills "the way we do things together" (Gherardi, 2009a). One SLT member described her experience of this organizational design as "flourish[ing] like an ecosystem, with the SLT as a primary source of energy radiating" (Mirijamdotter, 2009).

4.10 Professional information practices

Building on Mirijamdotter's earlier capacity building work, 18 months later, an Australian Fulbright Scholar-in-Residence, Hilary Hughes, coached Shared Leadership Team members on workplace applications for informed learning. To enhance the potential of the "practice lens" (Gherardi, 2009b) to animate connections-in-action that transform "organizational learning to knowing in practice" (Gherardi, 2006), she facilitated learning experiences on user needs analysis, learning space design, and service model evaluation. Hughes' approach demonstrated the twofold value to professional practices of informed learning: to expand one's workplace learning framework and to

apply this theory to enhancing others' learning experiences. In a subsequent evaluation of SLT members' experiences and outcomes, she found that the three key principles of informed learning (Bruce & Hughes, 2010) were present.

Principle #1: Informed learning builds on learners' own experiences of using information to learn.

Principles were applied to practice through SLT members' expansion of their professional knowledge through enhanced conversance with Informed Learning theory that explicitly connects information with learning. This encouraged further attention in SLT oversight discussions and decisions to ensuring the redesigned programs and services enable others, such as co-workers, students, and professors, to expand their experiences of using information to learn in more varied academic contexts and in more critical, ethical, and creative ways.

Principle #2: Informed learning promotes the simultaneous learning of discipline- or profession-related content or practices, and learning about the experience of using information.

Through participating in informed learning workshops, discussion, and projects, SLT members enhanced their own disciplinary knowledge and practice of informed learning as an emergent theory and practice within the field of library and information science. Through encouraging collaborations in informed learning-based curriculum development and teaching, they aimed to enable others, such as co-workers, students, and professors, to extend their experiences of using information to learn about their discipline in academic programs, course assignments, or research topics.

Principle #3: Informed learning is about the changing learners' experiences to become in order to be reflective learners, helping them to develop new and more complex ways of working with information.

Through developing and implementing innovative new policies and practices, and evaluating, discussing, and reflecting on these experiences, SLT members gained new understandings about their own use of information. Through sharing insights gained, they enabled others, including co-workers, students, and professors, to experience and to understand different ways of using information to learn in academic study, library research, and professional practice.

In the years following these facilitated evaluation workshops, SLT members continue to evaluate and redesign systems and practices. Members' varying perspectives on a problem situation and its improvement explore such questions as how to build heightened awareness of information experiences through using information to learn, rather than merely acquiring generic information literacy skills. In addition, to further cross-functional teamwork, SLT agendas consider how to advance social collaboration and interprofessional interdependence, rather than emphasizing individual capability.

In complementary activities, formal and informal library leaders explicitly cultivate dialog and reflection expertise and opportunities for sense making and knowledge creation. They encourage and support, with fiscal and human resources, robust partnerships among organizational employees, campus leaders, and project beneficiaries, which further and extend collaborative Informed Systems practices and ensure their sustainability through ongoing learning relationships. In addition, professional development and organizational effectiveness opportunities are created, which focus on

intellectual use of transdisciplinary collaborative information practices, exercised within a workplace culture that further enables cross-disciplinary knowledge sharing, fortified by human resources and resource allocation incentives (Bruce, Hughes, & Somerville, 2012). The following examples detail the processes and outcomes of initiatives fostered by applications of Informed Learning theory and enabled by co-designed communications systems and co-created professional practices.

4.11 Web-scale discovery service

Given the importance of electronic resources management, discovery, and access to the entire organization, Technical Services staff members were first to initiate a collective reorganization process to “reinvent themselves” and their workplace. As a consequence, the acquisitions, e-resources and serials, and cataloging and metadata services were combined. Under this unified management, the processes associated with ordering, receiving, processing, cataloging, and other access and discovery management functions could be coordinated into a single workflow, visually represented as an e-resources lifecycle model. To accomplish this, group experiences of constructing solutions together were initially provided through reorganization activities that simultaneously cultivated shared leadership. “These cooperative efforts presented new opportunities to break down traditional silos; work collaboratively and cross-functionally; create more efficient workflows; establish backup training for continuous service; and promote increased communication within the department and library” (Pan & Howard, 2010). (For more information, see Attachment 4.5.)

Recent experience of designing “work around” workflows for non-unified workplace systems heightened Technical Services employees’ awareness of the need for a unified discovery system for library researchers (Somerville, 2013a). So they naturally assumed leadership responsibilities for selecting, customizing, and enhancing a Web-scale discovery service offering a Google-like single search box. Having learned the importance of supporting the full e-resources lifecycle through well-aligned workflows, these thought leaders also achieved consensus on the committed engagement needed across the organization to realize the promise of the discovery service as the place to go for full text, video, and images. Throughout the 2-year process from product evaluation to Web site launch, the collaboratively designed organizational learning system for sharing information, taking action, and generating insight, ensured progressive change in understanding the work-to-be-done together. For example, Web design professionals now regularly contribute Google analytics evidence that improves user experiences, as Technical Services employees continue to curate pre-indexed content and ensure its access.

“The active collection curation and interface customization roles assumed by public and technical services libraries illustrate their new professional responsibilities as collaborative content developers and system designers” (Somerville, 2013b). While engaging with new information types, workflow processes, and professional practices, Technical Services members necessarily established productive information-sharing relationships beyond the boundaries of their usual work teams. They learned

to appreciate the interrelated elements of robust workplace information experience: its context-situated nature; its connection with informed learning, which uses information to learn; its potential for transformative outcomes; and its social dimensions. Such critical and creative information use, when applied to the generation and sharing of new knowledge, can also inform programming decisions, of benefit to others, as illustrated in an inclusive planning process for facility renovation.

4.12 Facility space redesign

The need to anticipate and support rapidly changing higher education learning and teaching patterns necessitated redesign of library facilities. In keeping with the Library's inclusive collaborative design philosophy, action-oriented investigations engaged organizational beneficiaries and campus stakeholders in visioning activities using information to learn (informed learning). For this purpose, participatory action research was selected to guide information gathering, interpretation, and dissemination, in a continuous learning cycle (Argyris & Schön, 1991; Heron & Reason, 2001). As this initiative demonstrates, reflective practitioners can learn through collaborative inquiry processes that engage co-workers in conducting research with, and for, concerned others.

Over an 18-month period, to exercise systems thinking and advance holistic understanding, librarians solicited various constituencies' points of view. Data collection methods included online and "paper and pencil" surveys, semi-structured interviews, "library as lab" course assignments, formal meetings, and participant observation logs, culminating in an architectural charette (design workshop). Participants included senior academic leadership at the provost and vice chancellor level, senior and middle management in student support services, elected officers of student governance assemblies and committees, campus master planners, and academic deans and directors. All were engaged around such questions as: How should the library, and its services and collections, serve the institutions? What programs not in the library at present, should be in the facility in the future? How does the library add value to the academic experiences of the students and faculty? How is the library building presently perceived, and how can it function in the future as an interdependent facility with other learning and teaching opportunities on campus? How much of the traditional library program must remain in the centralized facility? How does the library reflect the vision of the institution of which it is a part? (Somerville & Brown-Sica, 2011; Howard & Somerville, 2014).

In a "signature" Auraria Library approach to evidence-based decision-making, which engages students enrolled in academic courses, the evolving purpose of the library facility in the academic enterprise was collaboratively reconsidered, guided by such questions as: How might this space enrich educational experiences? What are the learning essentials that can happen in this space that compels building or remodeling a brick and mortar learning space, rather than relying on a virtual one? How might this physical space be designed to encourage students to spend more time studying and

working more productively? For what position on the continuum from isolated study to collaborative study should this learning space be designed? Should this space be designed to encourage student/faculty exchanges outside the classroom? (Somerville & Brown-Sica, 2011).

In addition, students in two graduate-level architecture studios focused on the following provocative questions: “What type of physical environment, technology, and services are needed to support and enhance the learning and research experience of the Auraria Library community?” and “How could the Library involve campus students, faculty, staff, and administrators in cocreating the re-design concept?” (Brown-Sica, Sobel, & Rogers, 2010). Such engaging questions also catalyzed lively conversations on the larger question: “What is a library?”

Collective learning, guided by discovery questions and enabled by professional practices, underscored that library facilities must be conceived as an integral part of the institution as a whole. Therefore, the conceptual program phase of a facility—whether a new building or a facility renovation—must consider not only anticipated learning patterns but also institutional goals and aspirations, including the type of learning environment that faculty and students desire. It follows that, once the potential role and value for the library in the educational experience are clarified, alternatives for spatial organization can be explored through an architectural design workshop known as a charette, as a means to fulfilling educational vision, mission, and goals. (For more information, see Attachment 4.6.)

A number of facility improvements were incorporated into newly envisioned space utilization plans, informed and inspired by the preceding data collection and interpretation activities. For instance, building more collaborative study spaces, through de-selecting seldom or never used physical collections and then constructing technology-enabled study rooms, advanced the shared goal of improving learning spaces. Informal social learning opportunities were further encouraged through the addition of comfortable seating and initiation of café services. New outward focused public services were initiated through integration of research and technology assistance desks. Capacity building across functional units was advanced through relocating most staff to a shared work environment equipped with collaboration tools and meeting spaces. Viewed through the magnifying lens of the information experience, library employees collectively expanded their information horizons through engaging colleagues and stakeholders in library repurposing conversations and redesigning activities.

4.13 Organizational capacity building

The significant outcomes of the discovery services and facility design initiatives challenged and changed employees’ collective lenses for viewing the world and, ultimately, experiencing and knowing it. Workplace transformation evolved through more complex experiences of using information to learn. Over time and with practice, emergent curiosities and remarkable insights stimulated novel inquires and furthered collaborative explorations. Therefore, changing individuals’ lenses and, ultimately, the

collective worldview, progressively transformed employees' attention—and cultivated their enthusiasm—as informed learning became integrated into the workplace culture, thereby sustaining capacity for innovative discoveries and organizational redirections.

The possibility of organizational transformation through informed learning was initially catalyzed through appreciative inquiry. Upon this foundation of possibility thinking (i.e., of “the glass as [more than] half full”), a “soft” (human-centered) systems design process was introduced to create a unified workplace learning system. Within that enabling infrastructure, situated experiences of contextualized information now promote collegial exchange for taking action and building knowledge. In other words, “collaborative systems design and collaboratively designed systems ... enable and sustain informed learning—‘using information to learn’—in the workplace” (Somerville, Mirijamdotter, Bruce, & Farner, 2014).

Informed learning focuses on people's experience of using information to learn in different contexts, including what is necessary to make sustainable learning possible. Therefore, the values of collaboration and action were integrated into systems co-design and informed learning. As a consequence, the use of information for learning in ever expanding professional contexts has consistently grown collective capacity for knowledge advancement and, ultimately, workplace reinvention, despite volatility, uncertainty, complexity, and ambiguity in the scholarly landscape and in higher education.

Early on, the Associate Directors and I, with advice and counsel from SLT members, recognized the importance of purposefully enriching informed learning experiences, with the aim of furthering information exchange for knowledge creation. In addition to ensuring the co-design of an enabling systems infrastructure (human and technology), we encouraged co-workers to release outdated worldviews and embrace new ways of seeing, thinking, and knowing. This was encouraged through evidence-based decision-making processes supplemented by generous professional development and workplace training programs. Exposure to and engagement with new ideas informed the evolution of new professional worldviews and associated professional practices that privileged revitalizing—and “life giving”—informed learning experiences within an enabling reinvented culture. Over time, leadership was understood to be an organizational quality rather than an individual attribute.

4.14 Informed leadership reflections

The Auraria Library's forward thinking approach to shared leadership is imminently transferable to information- and knowledge-based professional work in other industries, which also require the decentralized application of expert skills and understanding. In response, the Informed Systems Leadership model recognizes that information work today requires that employees draw from a wide range of information sources and engage with information related activities that enable them to know the information landscape of the workplace; to understand how information is situated within it; and to connect with the performance of work as it happens (Lloyd, 2013). The model therefore recognizes that there are many ways of knowing how work happens. It acknowledges the many ways of understanding, experiencing and conceptualizing it

(Lloyd, 2005), as well as enacting it in practice, and therein anticipates the changing nature of leadership requirements in contemporary organizations.

The conception of “information” in Informed Systems is seen as embedded and embodied in different social practices with associated artifacts and activities that assume meaning within the context of specific workplace practices (Lloyd, 2010). When everyday information experiences become intentionally informing and action-oriented outcomes are purposefully enabled, this can produce a vibrant social learning system (Wenger, 2000). As preceding examples illustrate, organizational members can learn for a world of constant change as they co-create dynamic and robust workplace systems and practices dedicated to “using information to learn.” Within this enabling infrastructure, they can experience information use as transformative if they necessarily exercise and elaborate their informed learning through cocreation of synergistic information experiences.

This application of informed learning in the workplace acknowledges that employees’ capacities build on intentions and behaviors directed by internalized worldviews. It follows that as shared intentions, collective behaviors, cultural groundings, and professional processes evolve, employees gain more complex understanding of their work and worldviews, and those of others. Using information thereby requires and extends shared leadership principles and practice, activated by appreciative inquiry aspirations and action research intentions. Collaborative design of enabling learning systems that harness technologies and promote discourse ensures collective capacity for knowledge advancement and, ultimately, workplace reinvention.

According to one employee’s assessment, “With the force of our collective dreams, explorations, research, vision, outreach, and collaborations, the Library is evolving into both an intellectual and physical ‘destination’. ... We are at the confluence of many forms of information and its usage, ... the future of workplace learning and organizational transformation, amidst rich diversity of local and global thoughts and ideas.” This unsolicited testimonial reveals, as this chapter describes, a vibrant workplace animated by informed leadership activities, purposeful information experiences, enabling learning systems, and associated professional practices. These accomplishments underscore that learning is a socio-cultural process which facilitates “the construction and reconstruction of the learner” (Lloyd, 2006) through interactive relationships among information, technology, and people. Therefore, forward thinking organizational leaders are ultimately responsible for construction of learning, of learners, and of the environments in which they operate (Hager, 2004).

The information interaction or use and what is being learned, as well as the professional practice that guides learning outcomes, are vital elements in informed learning. This is all the more so because in drawing deliberate attention to the relationship between information and learning, intentional information experiences can simultaneously advance both situated domain knowledge and transferable learning capacity. In addition, the characteristics of the learning environment, reinforced by the social process of defining those essential elements, serve to underscore “the social nature of using information to learn” (Bruce, 2008) and encourage “social collaboration or interdependence between colleagues rather than emphasis on individual capacity” (Bruce, 2008).

4.15 Concluding observations

The Informed Systems Leadership model identifies organizational processes that create and sustain co-designed learning systems and collaborative information experiences to evolve employees' ability to adopt and adapt, create and recreate, contextualize and recontextualize (Lloyd, 2003). As learning occurs, employees can see the world in new and more complex ways, transforming worldviews, and therein advancing new ways of seeing, knowing, and being in the world.

More specifically, Informed Systems recognizes the value of a collaborative design approach for socially enacted learning and action to enable workplace inquiry to explore, engage, and extend relationships among people and ideas. This oftentimes requires employing technologies and always requires exercising practices. Ideally, the latter occurs “with and for” organizational beneficiaries, in the spirit of collaborative discovery, through a participatory action research orientation. When embedded in organizational culture, this approach to “working smarter” (Somerville, Howard, & Mirijamdotter, 2009) enables robust information exchange and knowledge creation practices that persistently improve and enhance enabling systems, activities, and processes, so learning—and learning how to learn—advances.

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