Building on what we know: Staff development in the digital age

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Abstract

This case study reports outcomes of an organizational change project at California Polytechnic State University ("Cal Poly") in San Luis Obispo, California, USA. Interactive planning and systems thinking provide a robust foundation for rethinking workplace activities, so as to prepare staff members for enhanced participation in an increasingly digital information environment. These organizational development tools activate and extend participants' knowledge, skills, and abilities through purposeful dialogue that cultivates holistic perspectives. Enhanced appreciation of campus constituencies' differing needs and preferences, complimented by ongoing user-focused data collection and analysis, informs strategic systems and services redesign. This practice serves to promote continuous learning, even as it advances the organization's digital migration. Results-to-date suggest the efficacy of this staff development approach, which uses constructivist 'building on what we know' learning strategies to develop nimble organizational responsiveness, amidst dynamically changing external circumstances.

Paper type: Case study

Key words: systems design thinking learning dialogue interactive planning
To successfully meet the future, we believe that libraries must change from static resource centers to dynamic centers of instruction, exploration and learning. Achievement of this ideal vision challenges many traditional conceptions of the library as a physical entity as well as a service provider. The relationships with various university constituencies and campus partners must be revisited and reframed, both internally from library staff members’ points of view, as well as externally from faculty and students’ viewpoints. In order to accomplish needed changes in perception and outcomes, we employ interactive planning to advance library staff members’ capacity to make transformative design/redesign decisions. Our dialogue-driven staff development approach is based on systems thinking frameworks that create collaborative learning opportunities in the workplace. This serves to enhance participants’ abilities to share information for innovative knowledge generation within work teams, learning communities, and social networks. Doing so will increase the perceived public value of the library in the academic enterprise.

Organizational Context

In this paper, we report results from the first year of an organizational transformation initiated in January 2004 at California Polytechnic State University ("Cal Poly") in San Luis Obispo, California, USA. We focus on the experiences and accomplishments of the library’s public services division - renamed Information and Instructional Services Group (IIS). Necessitated by diminishing state government funding that required doing more with less, sixteen IIS staff members embarked on an inquiry that has yielded both an organizational roadmap to the future and navigational thinking tools to chart the routes. Ongoing assessment ensures continued realignment of IIS programming with both library and university priorities, amidst continuous changes in the internal and external environments.

Outcomes of this first year experience include creation of improved horizontal collegial communication that does not depend on ‘top down’ direction from library leaders. Rather, peer-to-peer dialogue facilitates information exchange that produces collective insights. Shared context supports well aligned individual and team decision-making. Here we highlight aspects of this reorganizing and repurposing initiative, in which dialogue informs a learning journey (Banathy and Jenlink, 2005) as participants employ interactive design practices to create an ideal library future. With a particular focus on systems co-design, we describe the participatory processes informing decision support, staff education, and interactive evaluation functions, which have heightened engagement among library staff and with campus stakeholders.

Underpinning our organizational transformation strategies are systems thinking which, as the name suggests, encourages viewing the organization as a system. Systems thinking methodologies enable appreciation of the interdependent relationships with customers, supplies, and other stakeholders as well as analysis of influential internal and external environmental factors. Additionally, as this approach requires renegotiation of the boundaries of influence and concern, it also assures reflection on organizational culture, systems, and structures. Below we report on the utilization of user-centered systems thinking tools for collaborative invention of organizational systems and services, which both anticipate users’ needs and ensure ongoing staff learning.
Strategic Library Directions

A new library strategic plan, titled *Creating New Educational Horizons: Building the New Teaching and Learning Environment*, describes the 'destination' for Information and Instructional Services staff. Within the context of profound changes transforming higher education, the document expresses staff recognition that the library organization must reconsider its traditional approaches for enhancing teaching and learning and advancing scholarship. Moving from an inward focus on acquiring books and other printed materials to an outward orientation that emphasizes seamless user access to systems, services, and sources requires questioning fundamental beliefs and values, communication patterns, structures and core working assumptions, as we better align our organization with the priorities of the emerging eUniversity.

The strategic plan’s five organizing initiatives provide further context for aligning individual and group actions with institutional priorities:

Initiative 1. Academic Teaching and Learning Partnerships

**Goal:** Advance student and faculty learning and research through effective knowledge management, including consultation and collaboration on instruction and collections

Initiative 2. Digital Teaching Library Development

**Goal:** Extend the physical library into a digital library that connects users to teaching, collections, research, and services, while building and maintaining valuable core relationships

Initiative 3. Sustainable Funding for Advancement of Shared Goals

**Goal:** Demonstrate the library’s public value to academic constituencies to attain and sustain campus and external funding for advancement of shared goals

Initiative 4. Strategic Physical and Digital Environments

**Goal:** Improve current physical facilities and create digital sites uniting strategic library, academic programs, and computing functions

Initiative 5: Human Resources Investments

**Goal:** Create and increase opportunities for staff to contribute fully to the mission and strategic priorities of the library
As staff grappled with the library’s new roles in knowledge management, knowledge creation, and knowledge integration, they reconsidered operating assumptions and day-to-day priorities. Systems thinking methodologies, enriched by interactive planning tools and techniques, enabled their efforts to frame real world inquiries, inform information exchange, and sustain purposeful dialogue in the workplace. Systems thinking practice serves the additional purpose of encouraging contextualization of real world issues in terms of interactions and relationships. In the past year, this dialogue-driven transformation strategy has shifted organizational attention from collection building to emerging digital age service priorities (Moyo, 2004).

**Systems Thinking Methodologies**

While a variety of systems thinking-based methodologies exist (Jackson, 2003), we apply two primary methods (Somerville and Mirijamdotter, 2005). The first of these, idealized systems design methodology, emerged out of Dr. Russell Ackoff’s consultancy in corporate America. At Cal Poly, we leverage this process for envisioning, planning, and evaluating in a library organization setting. To supplement the learning inherent in this organizational change strategy, we add insights from the field of educational pedagogy – i.e., constructivist teaching strategies that intentionally activate and extend prior understanding.

Soft Systems Methodology (SSM), our second primary methodology, has been in development for over thirty years by Dr. Peter Checkland and his associates at the University of Lancaster in the United Kingdom. It is comprised of an iterative four-stage process – finding out, modeling, comparison, and taking action. Among the numerous outcomes of this rethinking application is clarification of participants’ relationships to each other and to other internal and external stakeholders. These insights emerge quite naturally, as one of the defining characteristics of SSM practice is intentionally bringing multiple perspectives to the table. Furthermore, by its very nature, Soft Systems Methodology creates a relational context that encourages individuals' recognition of the aspects of their workplace expertise that, if shared, advances group understanding. The resulting information exchange fuels collective knowledge creation and integration (Checkland, 1999).

**Interactive Planning Processes**

Our interactive planning process emerges from the applied theory of Dr. Russell Ackoff. He describes the approach thusly, "Interactive planning is directed at creating the future. It is based on the belief that an organization's future depends at least as much on what it does between now and then, as on what is done to it" (Ackoff, 2001, p. 3). This process enables design of a desirable future scenario accompanied by ways of realizing this preferred state. The future is attained through continuously closing the gap between the organization’s current and desired circumstances.

Interactive planning has two parts – idealization and realization – comprised of six interrelated phases: (1) situational analysis, (2) ends planning, (3) means planning, (4) resource planning, (5) implementation design, and (6) interactive evaluation. Situational analysis, the first stage, provokes re-examination of internal and external conditions. Findings inform an envisioning process aimed at imagining an ideal future. The realization processes that follow include inquiring how to achieve that future state. This requires asking: What resources are required? When and by whom will implementation occur? And by what means will outcomes be regularly compared to the ideal to ensure optimal alignment? Since this is a cyclical
process, ongoing monitoring of changing circumstances oftentimes provokes another question: Given changes, how should we revise our ideal future scenario? The new scenario then directs appropriate realignment efforts.

Situational Analysis

Situational analysis is the first stage of idealization. Its purpose is ‘formulating the mess’. This presupposes that every organization is faced with a set of interacting threats and opportunities - a system of problems experienced as ‘a mess’. In the Cal Poly case, this was evidenced by a lack of shared operating assumptions. During this stage, therefore, we asked: Are we owners of collections and gatekeepers of information? - a ‘just in case’ paradigm. Are we intermediaries between users and increasingly electronic and networked resources? - a ‘just in time’ set of assumptions. Or are we architects of adaptive information-rich learning opportunities? - a ‘just for you’ perspective (Mirijamdotter and Somerville, 2003). Analysis prompted our recognition that we were experiencing an organizational identify crisis that prevented confidently moving forward.

Deep reflection, enabled by systems thinking tools, prompted the recognition that our new core business involves learning that focuses on information. For further insight, we looked to the profession’s information literacy principles, practices, and standards at both the national and international levels (Association of College and Research Libraries, 2000, 2003; Bundy, 2004). We were also aided by our membership within the 23-campus California State University (CSU) system, where information competence has been recognized as a desirable graduating senior attribute for over a decade. Recently, through partnership activities with the national Educational Testing Service (ETS), this capability has been reframed as ‘information and communication technology literacy’, which explicitly acknowledges the importance of technologies to access, manage, integrate, evaluate, and create information (Educational Testing Service, 2002, 2003). This initiative recognizes that preparing students to meet the challenges of the future is an increasingly difficult challenge for institutions of higher education. For many (if not most) students, that future will include a wide-ranging assortment of information and communication technologies, including those that are familiar today as well as those not yet imagined.

National leaders in U.S. industry and academe have underscored the importance of information and communication technology literacy. One such conversation group, the Business-Higher Education Forum, has concluded that “building a nation of learners” requires graduates proficient in such cross-functional skills and attributes as leadership, teamwork, problem solving, and communications (Business-Higher Education Forum, 2003). In a complimentary dialogue, Partnership for 21st Century discussants have stated that any consideration of graduates’ requisite skills should recognize that technology and advanced communication have transformed the world into a global community, with business colleagues and competitors as likely to live in India as in Indianapolis (Partnership for 21st Century Skills, 2003). Moreover, flattened hierarchies require employees to work productively in teams and communicate directly with customers. Given these realities, employers now require entry-level employees prepared to acquire new knowledge, learn unfamiliar technologies, rapidly process information, make informed decisions, and communicate information effectively.
Locally, through a qualitative study of conceptions of information held by students, IIS members came to a renewed understanding of the importance of technology-mediated information in Cal Poly students' lives (Maybee, 2004). Findings demonstrated that undergraduates increasingly rely on technology to access and manage information and communicate with one another in the community, in schools, and at home. Additionally, whether gathering information about a political candidate using the Internet, communicating with friends or family via e-mail, managing personal finances through online banking services, or searching for a book in a computerized catalog at the library, they depend on cognitive skills needed to manage, evaluate, create, and integrate information and knowledge - for which they report requiring technical expertise to search, organize, and communicate.

Probing deeply into the library psyche during an obstruction analysis identified organizational characteristics and properties that prevented progress among staff in both developing these requisite knowledge, skills, and abilities themselves and also advancing it in others. For instance, we discovered 'parts mentality' which encouraged actions that were unaligned with the organization's strategic priorities. Our internal focus on library processes and procedures prevented meaningful engagement in the teaching and learning activities of the university. In short, the independence typically associated with professionalism encouraged an absence of teaming skills. The assumptions of our employee reward system encouraged information hoarding, so we did not have group thinking skills. For instance, we did not know how to make sense of the seeming threats posed by Google Scholar or Amazon.com. Even more puzzling were the implications for libraries of such multinational corporations as Barnes and Noble and Starbucks, which promote reading, conversing, and computing in terms of community building, dark espresso, and fresh croissants! Our organizational prognosis was not encouraging. We agreed that, given the steady decline in our operating budget, our future was uncertain if no changes occurred in our current plans, policies, and programs.

**Ends Planning**

During ends planning, organization members imagine what the organization would ideally be like, independent of current realities. In creating this scenario, participants assume that the organization is completely destroyed and they must rebuild it entirely. Then they design a new system, subject to only two constraints - technological feasibility and operational viability - and one requirement - an ability to learn and adapt rapidly and effectively. The remainder of the iterative design/redesign process is directed at removing - or at least reducing - gaps between current realities and the ideal scenario.

IIS group members engaged in idealized design projects with the twofold purpose of planning for advancement of their knowledge, skills, and abilities - especially digital age capabilities in information, communication, and technology - as well as those of campus constituencies. This is expressed as a fusion of information literacy, computer literacy, multimedia literacy, technological literacy, ethics, critical thinking, and communication skills, including:

1. **Tool competence** - the ability to consume and produce print and electronic resources, including new media,
2. Research competence - the ability to formulate effective research questions and search strategies for finding, evaluating, organizing, and communicating information,

3. Publishing competence - the ability to infuse original ideas into a community of inquiry, including web based environments,

4. Resource competence - the ability to select appropriate formats and sources during information retrieval and, following information evaluation and knowledge integration, to choose appropriate channels for dissemination,

5. Social-structure competence - the ability to understand how information is produced, including but not limited to the professional publication process, emphasizing how information exchange fuels knowledge creation,

6. Technology competence - the ability to use information and communication technology tools for effectively finding, organizing, and presenting data, information, and knowledge.

Staff members build these ambitious competencies by looking at their organization holistically (through application of systems thinking) to acquire new knowledge, learn new technologies, make data-driven decisions, and communicate new understandings. Illustrative of progress-to-date is the Research and Information Services and Education (RISE) decision support system (Somerville and Vazquez, 2004), which demonstrates the learning potential of participatory information systems design. Reference desk transaction analysis informed the genesis of the RISE system. Findings revealed that the majority of queries were assignment driven, and therefore predictable, so they could be satisfied by paraprofessional staff. This permitted professional librarians, for whom reference desk service had been their primary responsibility, to reinvent their work (Somerville and Vuotto, 2005).

When reference service responsibilities were assigned to six paraprofessional staff members, they were charged with inventing a system to support the information and instructional service duties. In the beginning, they imagined the system specifications based solely on their previous work experiences. Subsequent iterations of the decision support system were enriched through insights derived from Soft Systems Methodology (SSM), which intentionally incorporates the viewpoints of customers and other stakeholders into system designs.

Through structured conversations guided by Soft Systems Methodology, participants received opportunities to share perspectives. These purposeful conversations explored, questioned, and framed project members' growing understanding of an enlarged workplace context. Their conceptions were captured in visual SSM renderings of the situation. These drawings provided a common reference for renegotiating increasingly more complex nuances, as well as larger and larger boundaries of influence and concern.

The latest system design reflects participants' recognition of the benefits of information sharing for collective advancement in understanding - in this case, as it relates to staff members' abilities to assure students' success in completing assignments. The learning potential of conversations - and, more explicitly, the importance of capturing learning from those discussions prompted staff design and development of a computer-enabled forum.
Following this, staff created a second RISE system component: an assignment database. Coursework documents are captured and stored for access, made accessible by staff-defined metadata and, with the guidance of subject specialist librarians, appropriate research suggestions are recommended. This new program responded to transactional analysis findings that demonstrated, in Cal Poly’s case, that course assignments produced the majority of inquiries at the public services desk. Over time, staff members have gained the confidence to map assignment service strategies onto coursework learning outcomes.

Paraprofessional preparation includes co-design of a third system component.

**Means planning**

Means planning involves inventing the courses of action, practices, projects, programs, and policies needed to implement the organization’s idealized (re)design and guide appropriate resource (re)allocation decisions. At this point in the interactive planning process, paraprofessional participants recognized that the boundaries for their work had extended to include other academic partners such as faculty librarians and academic faculty, as well as undergraduate and graduate student users. In response, staff members initiated planning for a third element for the RISE system, an educational component, to ensure sustainable high quality service.

Planning was initiated in July 2004 as seven technical staff members prepared to provide five hours of public service per week, beginning in the AY2004 fall quarter. The original RISE staff pro-actively recommended content and design for an ongoing education program anchored in an intensive six-week summer course. Course content focused on advancing ICT literacy, as required to successfully aid students in completing course assignments. Course processes underscored that dialogue-driven conversations (face-to-face and computer-mediated) produce insightful improvements in the technical and social systems necessary for responsive information and research consultation services. This notion continues to inform ongoing educational sessions held weekly throughout the academic year.

**Resource Planning**

As the name suggests, resource planning involves determining the resources- i.e., facilities, equipment, materials, services, personnel, funding, information, and knowledge needed to achieve organizational purposes. While Cal Poly participants’ resource allocation decisions are particular to our organization, the values that guided the resource discussions are transferable to other learning organizations.

Resource discussions are predicated on the belief that organizational sustainability can best be advanced through ‘facilitative participation’ (Wellman and Lipton 2004) in which team members purposefully contribute to team learning - i.e., both the process of making resource allocations and the outcome of those decisions equally facilitate the participative growth of all staff members. Exemplary of Cal Poly’s ‘learn by doing’ approach, organizational leaders model the systems thinking underlying these new organizational values (Mirijamdotter and Somerville, 2004). In the role of enabling architects of workplace learning environments, they demonstrate that systems thinking is both a preferred and
successful way to structure individual and group thinking processes. For instance, even when speaking about the personal, they explore situational context. In this way, leaders incrementally build new interpretative frameworks – including new workplace stories - that enable co-construction of rich relational information experiences that produce novel insights and transform workplace culture.

Team capacities for collaboration and community develop as the organization recognizes its shared core business and strategic directions while also enhancing a toolkit for supporting clear thinking and group communication. In the process, trusting relationships within the group are strengthened which sustains dialogue-driven learning. Shared commitment to build upon diverse viewpoints also ensures the psychological safety that further animates collaborative learning.

Implementation Design

Implementation design involves determining who is to do what, when and where. While the particulars of the RISE system design and development are specific to the Cal Poly situation, the workplace implementation philosophy is transferable to other organizations – i.e., system design decisions are informed by earlier learning. In this case, the initial situational analysis revealed that many of the library's systems, structures, and practices were still based on earlier industrial age models. By summer 2004, the workplace culture was increasingly focused on learning and innovation. Within this new context, more appropriate to today's fast paced, rapidly changing circumstances, peers planned an educational approach that leveraged the success realized to that point by proactive information exchange. Dialogue, therefore, was a critically important element of the instructional design. The new organizational climate made temporary obstacles easily negotiable - as illustrated by adoption in AY2004-5 of a formalized weekly program of study that dynamically anticipated service queries and thereby ensured staff success in coaching library users.

Indicative of the extended boundaries in which paraprofessionals now operate, course design also relied on the constructivist pedagogy embedded in the relational information literacy principles, standards, and practices of the 2nd edition of the Australian and New Zealand Information Literacy Framework (Bundy, 2004). The ANZIL approach recommends problem-based learning so course content incorporated actual assignments and queries from AY2003-4. Intentional conversations also encouraged participants to share tacit knowledge and build on what they know, thus making explicit the purpose of advancing collective understanding.

In the process, course participants with upwards to forty-two years of technical services experience, realized that their expertise was transferable to delivering navigation advice and information consultation for digital age systems users. As staff perspectives shifted from only seeing themselves as builders to also viewing themselves as users of library systems and services, they gained a new appreciation for the outcomes of bibliographic systems and other library tools. Reflective of this new understanding, the lower level task of entering descriptive bibliographic data into the online public catalog, PolyCat, was
reframed as a higher level responsibility for 'enabling intellectual access to ideas'. This perspective recognized that interconnected systems of knowledge production and bibliographic access fuel inquiry and produce documents which users access in an OPAC finding tool. New awareness informed a larger, systemic understanding of the purposes behind data entry activities that, in turn, inspired reconsideration of how to better anticipate the variety of ways that potential users of bibliographic records might approach subject matter. Actual experiences with the public ensured more accurate predictions of users' access strategies and assumptions.

Interactive Evaluation

Interactive evaluation requires conducting on-going data collection and interpretative analyses with the intention of applying resulting insights to improvement of specific situations. In the Cal Poly example, the definitions and interpretations of evaluation criteria are increasingly focused outward, making complex and nuanced circumstances more intelligible for systems thinking practitioners. Interactive evaluation is also experienced as an opportunity to engage in conversations about ‘the making of shared meaning’ with users as well as peers for the purpose of stimulating new levels of insight and understanding. The proven usefulness of this holistic framework, populated by practical thinking tools, prompts staff members to regularly engage in dialogue supportive of continuous improvements. The value of interactive evaluation was made explicit in the education course through pre and post course learning assessments, supplemented by weekly course evaluations, which were reported back to participants for their interpretative discussion. Librarian instructors' responsiveness in adjusting the original lesson plans demonstrated the efficacy of learner-directed customization of formal and informal educational efforts. Staff now mindfully apply this service philosophy at the public desk; possessing a heightened awareness of reference interview dynamics, which honors and accommodates individual users' unique needs and preferences.

In their continuing educational program, staff members increasingly direct the content and process of their own learning based on the interactive evaluation questions which guided the summer course: What do we know that is transferable to digital age research and information services? What more do we need to know? And how do we choose to learn this? While this example is framed in terms of requirements for ICT fluency, the underlying logic is easily adaptable to assessing individual and team readiness for any strategic staff-driven library initiatives, independent of particular workplace circumstances. Results-to-date indicate that, when this line of thinking is internalized among team members, their confidence, collegiality, and capability are furthered and this provides a foundation for continuous improvement.

Conclusion

Cal Poly's call to action was precipitated by widespread recognition that the organization's role had shifted from providing collections for potential usages to delivering digital information access and navigation advisement supportive of documented knowledge creation needs. Organizational members realized that if they were to successfully assist others in
their learning journeys, they required ongoing advancement of their own knowledge, skills, and abilities. However, they lacked a road map for navigating this new terrain and were unprepared to make sense of changes in the internal and external environments. This first year experience report introduces and tests systems thinking tools intended to enable improved organizational responsiveness amidst these dynamic changes.

Several guiding principles for initiating and sustaining deep organizational learning have been substantiated by our results to date. First, all organizational participants must hold a shared vision of the organization's core business. They must become capable of engaging in peer discussions, based in systems thinking, to revisit work roles and responsibilities and readjust budget allocations and other resources. These activities involve problem finding, which frames and focuses workplace dialogue. As ideal designs are manifest through ongoing realignment activities, staff members must also continuously reassess needed staff competencies and generate learning strategies that build and extend collective expertise. Lastly, design and development of a technology-mediated system is a particularly fitting activity for staff development, as it both provides hands on practice with incrementally expanding system boundaries and also advances the information and communication technology fluency required of digital age library personnel.

On a more practical basis, in order to optimise the formal and informal conversations that offer 'teachable moments', participants attention should focus on the organizational information, including primary documents, most germane to real world problem-based learning. Beginning with the familiar provides an excellent point of departure and sets the stage for encouraging more holistic enterprise-level thinking, applied to increasingly unfamiliar data and information sources. In addition to moving people beyond parts thinking, this strategy leverages constructivist pedagogy that validates prior learning, even as it builds upon that foundation in constructing new understandings.

Our results suggest that, within an organizational environment animated by active learning opportunities, staff participants adopt attitudes and behaviours conducive to re-inventing their workplace competencies. Concurrently, as staff members discuss the nature of their work with peers, they gain improved understanding of the interrelated roles and responsibilities throughout the organization that encourages "valuing people" (American Library Association, 2003, p. 16) and their expertise. The excitement generated by passionate inquiries motivates sustainable workplace learning.
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