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Teaching Systemic Design Outside the Design School

Abstract

Courses emphasizing systemic design are taught in the Communication Management and Design program at Ithaca College for undergraduate students who seek to positively impact organizations and society through communication and learning. In a first-year course, students engage in a wide variety of learning activities and challenges through which they come to a basic understanding of systems thinking, design, and systemic design. This understanding creates a broad foundation for, and begins to develop connecting threads across, their studies of corporate communication, and workplace learning and performance. Then in their senior year capstone course students engage in a systemic design inquiry, which combines research and design in an attempt to address a critical current issue in organizations. Described here is the pedagogical approach for these courses, including underlying assumptions, links to strategy, and a rich set of concepts and tools that promote systems thinking in design, and which have potential applications beyond pedagogy. Also described is how these have all been informed by research.

Keywords: systemic design, organizational communication, design inquiry

Introduction

My research on systemic design, and my development of courses in the area have been mutually informing over the past twenty years.[1] The results include somewhat unique content and approaches in my courses, and the development of systems and tools for inquiry. To illustrate, I will describe two related courses and the research that informed their designs. I will start by describing my work context, then go back and forth between each course and my research.

To clarify, the conception of systemic design that I use is an extension of Banathy's (1996; 1991) comprehensive social systems design. This is a general view and means thinking holistically as one creates and innovates, for example: expanding boundaries; considering interdependencies and interactions with and impact in the larger system; designing *with* rather than *for* clients; attempting to include in decisions all those who would be affected; working toward ideal images rather than planning based on current trends; seeking to design the whole system including enabling systems, strategies for planned change, and so on. A general definition of systemic design such as this is a better match to the context of the courses described below than more precise alternatives from specific design fields.

I teach at Ithaca College, which is a residential college of about 6000 students with five schools: four professional schools in business, communications, health sciences and human performance, and music, along with a school of humanities and sciences. The College consciously attempts to promote integrated learning, most recently through a common integrated core curriculum, and more broadly through connections between liberal and professional education. My primary teaching is in a program called Communication Management and Design (CMD) within a department that brings together several fields, including my own, educational technology. CMD students are preparing for positions in a wide range of fields, including training and development, instructional technology, corporate communications, public relations, employee communications, and event planning.

At the start and end of the CMD program are courses that address broader issues, integrate the fields, and make connections outside communication. One such course at the beginning is Systems Thinking and Design, and one at the end is Critical Issues in Organizations.

Course 1: Systems Thinking and Design

I developed Systems Thinking and Design approximately twelve years ago to serve as a foundation prior to studying workplace learning and performance, and corporate communication. I originally named the course Undisciplined and Out of Control, after an article by Harold Nelson (1994), but our curriculum committees had no sense of humor. The goal of the course is to help students think holistically as they view circumstances in the workplace and world, and to imagine and take meaningful action to improve those circumstances.

The course includes a variety of components. There are five units: systems and designs in the world, systems thinking, designing, systems design in the workplace, and conscious evolution. For each unit, students explore a wide range of resources, one of which is assigned, and the others they select based on their interests. Then they write short papers that summarize the resources and draw links to concrete personal experiences. On the due dates, students share their insights and we have a rich conversation about what they gained.

The five units are supported by a series of learning activities (as opposed to lectures and exams). Here are some examples for each unit.

We start to explore systems and designs in the world by examining our physical surroundings. We look at door knobs, doors, room arrangements, signs, and so on in the school. Students use their cell phones to take photos of good and bad designs around campus, and we criticize these in class, considering, for example, Aristotle's four causes—material, efficient, formal, and final (see Adler, 1978). Also, in teams they explore accessibility of the campus and apply diffusion of innovation principles (Rogers, 2003) to changes they propose.

For the unit on systems thinking, we use "the wall" exercise proposed by Senge (1990) to appreciate interdependence, then we model various types of systems from multiple perspectives, for example, using Banathy's (1991) suggestion of models of system-environment, structure-function, and process-behavior.

To introduce the unit on design, we have a competition similar to Junkyard Wars (The Learning Channel, 1998-2004). Students attempt to develop self-powered vehicles from sets of random objects. Then we do an activity that compares design approaches: waterfall models, requirements analysis, scenario description, rapid prototyping, and appreciative design. We conclude with a case study (Loch, 2003) that illustrates that conceptualization is not useful without the second part of design—innovation.

To contextualize systemic design in the workplace, we do a series of role-plays. Students learn how typical internal and external consultations might occur in the area of workplace learning and performance. Then they see how functional areas need to work together as they (a) design structures and processes for corporate communication, then (b) attempt to bring those structures and processes together into a single department.

The primary activity for the final unit, conscious evolution, is an extended conversation about the future. For this, we use the Haudenosaunee (Iroquois) tradition of the talking stick, which is especially appropriate for us since our college and community rest on former Haudenosaunee lands.

Major assignments for the course include three increasingly complex challenges. The first is to redesign a physical object that they find to not work as well as they desire. They sketch and describe the object as it is, suggest a wide range of possible improvements, then select and argue for particular changes. The second is to model a natural, designed physical, designed abstract, or human activity system from at least three different perspectives. The perspectives may include Banathy's (1991) suggestions listed above. Importantly, students need to describe how the perspectives combine and reveal things that a single, independent view would not, as well as how their own perspective influenced what they saw. The third

challenge is to create a design that would potentially resolve a significant social issue. Teams choose an issue, model relevant systems from multiple perspectives, generate ways in which the issue might be resolved, then select and argue for one option. In a serious but fun competition at our final session, they present their ideas to a panel of guest experts. For each of the three challenges, students present their ideas and get feedback from their classmates at least once before papers are due.

The course has had several clear impacts. First, we faculty notice the application of systems thinking and design in their subsequent coursework. Second, we hear repeatedly from alumni how they have applied what they learned in the course in their professional work and, often, in their personal lives. Also, the reputation of the course has spread. Students in other majors frequently enroll when seats are available, and colleagues in other departments have often asked for the course to be included in their curricula.

Inquiry informing course 1 design

The approach we take in the Systems Thinking and Design course is a departure from typical content and instructional strategies in the educational technology field. More often systems and design are introduced in the context of a systematic, step-wise (waterfall) process for developing instruction, and typically at the graduate rather than undergraduate level. On my arrival at the college in 1991, I was assigned to teach the course in which this was done, Instructional Systems Development. I did so, and for all but a few students it was a failure. Majoring in corporate communication, which was the department and program name at the time, they had little interest in designing instruction, certainly not enough to sustain motivation as the process steps were revealed. I quickly switched to a series of design exercises, then to learning activities that focused on systems thinking and designing before we talked about instruction. This was far more effective and led me to propose and develop the separate course described above.

I was perhaps more prepared to do this than others in my field might have been because of my dissertation research (Rowland, 1993, 1992). I studied problem-solving expertise in instructional design, mirroring what others had done in various design fields (e.g., Lawson, 1980). Results demonstrated fairly clearly that in terms of expert behavior it was useful to see instructional design as a design field, rather than as an applied social science, which was the typical view at the time. Instructional design experts displayed the same kinds of behaviors as experts in other design fields, for example, challenging givens, problem setting via testing with early solution ideas, and so on. As a consequence, I wondered if the methods of design education, such as the studio, would be a better fit to teaching instructional design. Time has shown that to be the case, at least in my work context.

Simultaneously, I have conducted a series of studies on the nature of powerful/transformative learning experiences (e.g., Rowland, 2013). Emerging from these studies is a sense that, while experiences are highly individual, there are conditions in which powerful learning is more likely, including learning by doing in authentic contexts, supportive relationships with peers and mentors/teachers, deep engagement, and reflection in and on action. These themes are incorporated in the Systems Thinking and Design course, not as prescriptive principles but as heuristics for creating the learning environment. I have done the same in drawing from the literature on learning theory, particularly constructivism (e.g., Wilson, 1996). That literature has served more as a checklist—what am I forgetting?—than a prescription.

Combining the various sources, the pedagogical approach is thus to focus on learning activities, to rely on peer support, to shift the instructor role from content provider to problem-solving facilitator, and to build on learners' already sophisticated problem-solving abilities. The latter involves moving from concrete to abstract, rather than the typical course

that does precisely the opposite. Figure 1 (from Rowland, 1992) illustrates the two paths. My sense is that we can go nowhere in the course until students appreciate that change is possible and that they can meaningfully participate in making change happen. Leaping quickly to the abstract sets up the opposite, and often seems to have more to do with socialization to the academic discipline than with learning.

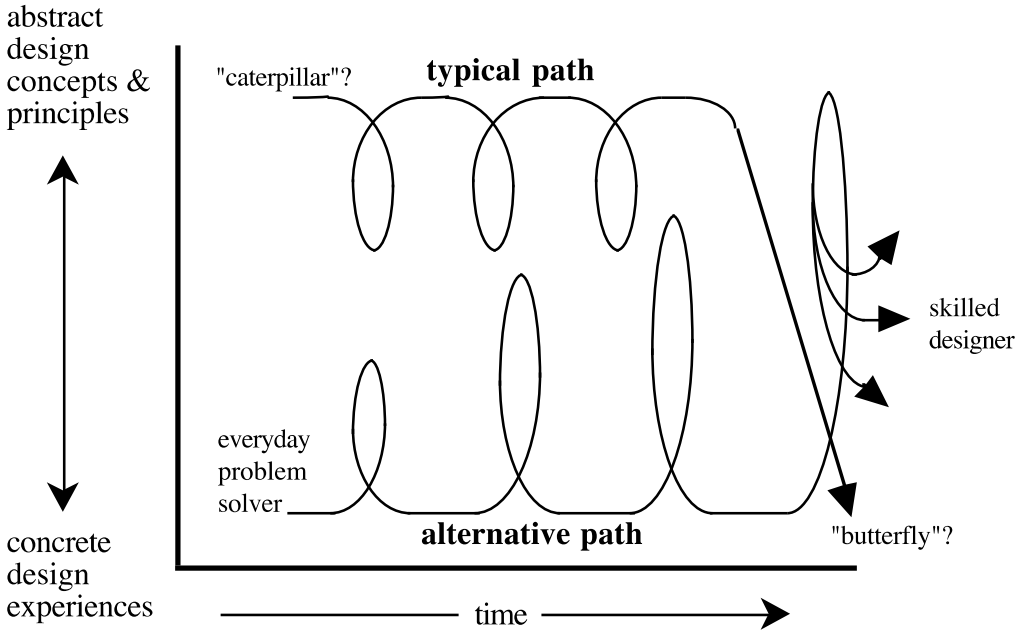

Figure 1. Typical and alternative paths in instructional design education.

One practice that has been invaluable in connecting the course design with my research, and the literature in general, is journaling. For this course, and for every class I have taught over the last thirty years, I have spent 5-10 minutes after class writing about what happened, what worked well and not, and how things might be changed in the future. I read this journal entry before the next class, and the entire journal before I teach the course the next time.

Critical Issues in Organizations

Four years ago, I was assigned to teach one of the senior capstone courses in the CMD curriculum, Critical Issues in Organizations. This opened up an opportunity to bookend the Systems Thinking and Design course with an application that relied on all that students had learned since their first year in the program. Rather than fairly straightforward research into a single issue, as had been the course approach in the past, students are asked to apply systemic design to issues of their choice. The goal is to encourage habit formation, in particular the habit of using their professional practice to take on major issues in our field and do so in a way that ultimately benefited society.

The first time I taught the course, I asked students to focus on the future of our field, broadly defined as communication and learning in organizations. They formed teams to explore various dimensions of what is called an evolutionary guidance system (EGS) (Banathy, 2000). Dimensions included technological, political, social-cultural, economic, moral-ethical, managerial, educational, and quality of life. They explored the dimensions, and they imagined the future of the field along those dimensions. Then they wrote individual papers that summarized their work and attempted to create a whole by making connections between the dimensions. Their work certainly gave us insight into the nature of our field, and we learned a great deal about the process of constructing an EGS. However, results were a bit

mixed in quality, and students' impressions of the course were rather poor. I recognized that the EGS remained abstract to them, that a semester of work restricted to a single dimension didn't match all interests, and also that my candid admission that we were breaking new ground failed to give them confidence. In the three subsequent years, I dropped the EGS and instead let students explore issues about which they are most passionate.

The course has evolved to include two major components. The first is a set of international guest interviews. In a quick survey, my departmental colleagues responded to the question, "If you could talk with anyone in the world about the future of our field, who would it be?" I contacted the people they listed and many agreed to be interviewed by my students. So, once a week a team of students conducts an interview with a guest expert via teleconference (e.g., Skype, WebEx) in front of the class. Prior to the interview, they share a biography of our guest and a paper or two that our guest recommends as representing his or her current work. They construct sample questions and ask other class members to suggest other questions. They conduct the interview, then share a transcription or notes with their classmates.

The second major component is a team-based design inquiry into a current and critical issue facing organizations. The design inquiry combines research to understand *what is*, with design of *what might be*. Some issues that they have chosen to explore the current semester include psychological fear in the workplace, the impact of social media, particularly in hiring, the glass ceiling for women, the shift of service interactions to online, and the relationships between virtual organizations and human needs.

The outcomes of the redesigned course have been very positive, particularly in terms of enriching students' understanding of, and skill in conducting systemic design, and pulling together everything they have learned over the four years of the program.

Inquiry informing course 2 design

There are many ways that research and design can be related (e.g., Sevaldson, 2010). My attempt to combine the two, using the general label "design inquiry," stems from a basic contrast (Figure 2, from Rowland, 2008). Research narrows from an area of interest to a specific study, then that study yields implications for the broader area of interest. The typical design process, on the other hand, tends to diverge from a narrower problem to a range of possible solutions, then converges on a specific option. The two shapes can be overlaid (Figure 3) to suggest an intertwined process in which activities transform one another, as suggested by the transformer symbol in the center. Importantly, the combination seeks to avoid privileging one form of inquiry over the other. For example, in the field of education, or more precisely, learning sciences, some scholars (e.g., Barab & Squire, 2004) pursue what they call design-based research (DBR). Perhaps both theoretical understandings and new designs may result, but design is clearly seen as merely a tool for research.

General approaches of research and design.

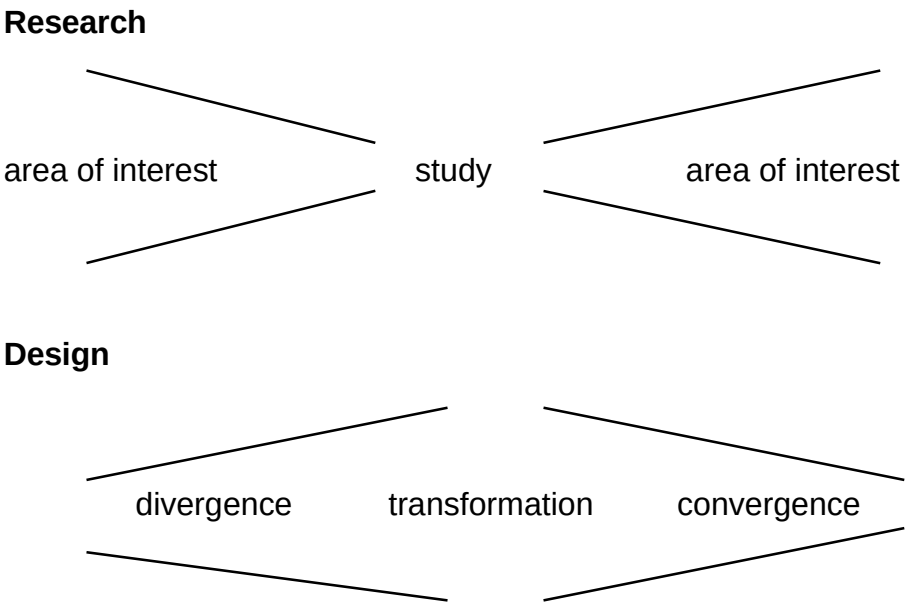

Figure 2. Research and design.

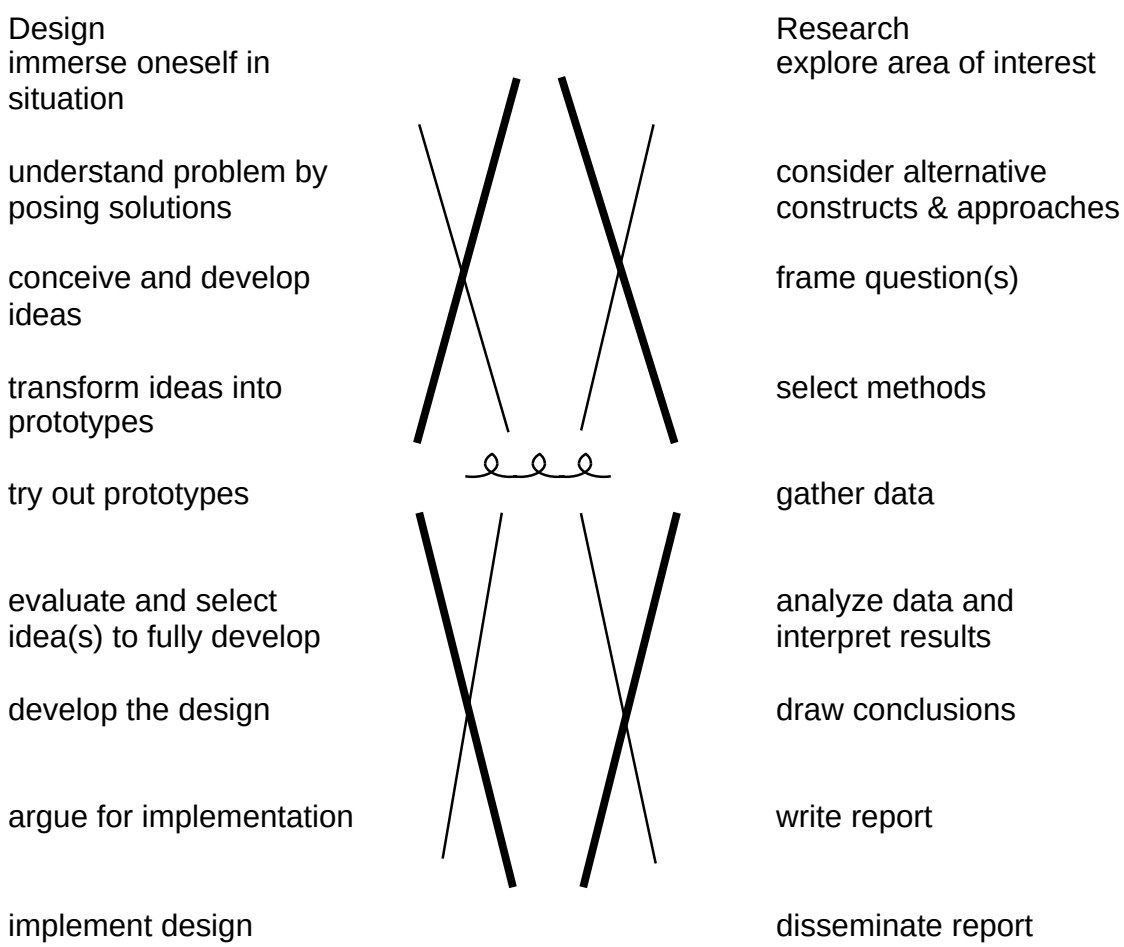

Figure 3. Integrated research and design.

In spite of their differences, DBR, this version of design inquiry, and similar efforts all recognize we require more complex systems of inquiry for increasingly complex problems. Educational research alone, for example, is not leading to educational innovation on a sufficient scale. Perhaps engaging in inquiry that exploits the strengths of research, seeking an understanding of *what is*, and design, imagining and creating *what might be*, has greater potential. For this reason, the notion of systems of inquiry, or inquiry systems (i.e., wholes, composed of synergistic constructs and relationships, dedicated to the search for knowledge), is intriguing.

I have been attempting to create an inquiry system that will help my students in the Critical Issues course. So far it has taken the form of a tool that they can use to strengthen their inquiry, particularly toward its conclusion, named Enhanced Design Inquiry System (EDISYS) (Figure 4, from Rowland, 2014). To use EDISYS, one defines a set of key parts—key constructs of research and design—then examines their relationships. Sets of questions then help to strengthen the parts and the relationships (Appendix A). Research and design processes are thus interdependent, so much so that they are initiated simultaneously from the definition of the issue at hand, concluded simultaneously with a product to respond to the issue, and based throughout on a common core (of values, for example).

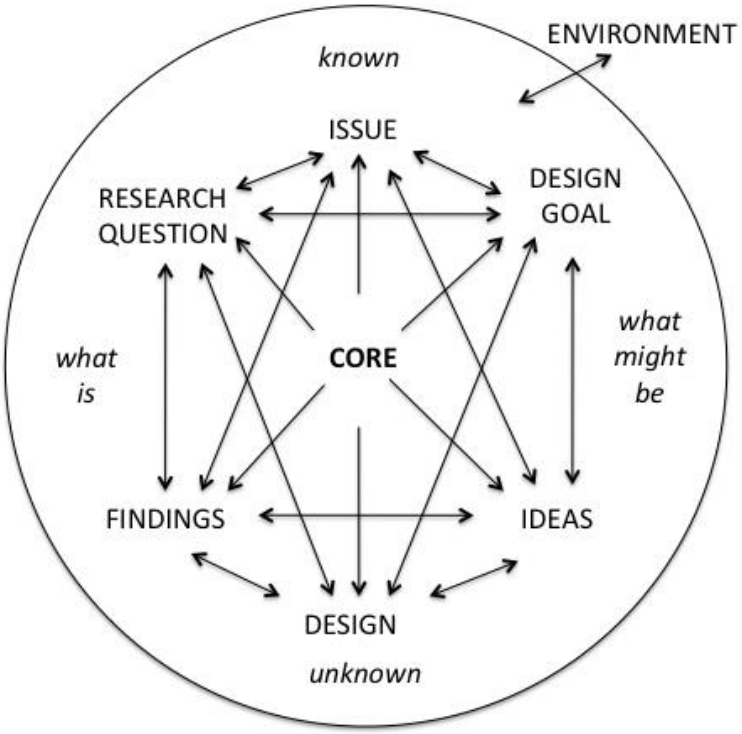

Figure 4. Enhanced Design Inquiry System (EDISYS).

The idea for EDISYS came from research I conducted a number of years ago on systemic relations (Rowland & Adams, 1999; see Figure 5). We sought to determine how expert instructional designers think about relationships during design. We asked them to identify key objects or constructs that they define in the processes of analysis and synthesis, then to describe relationships among them, in the form of questions they might ask. The results suggested that experts consider relationships in far more nuanced and sophisticated ways than the literature of our field, in particular descriptions of systematic process models, would lead one to believe. Consequently, I am attempting to build EDISYS to lead my students toward expertise through sophisticated questioning. The questioning simplifies, in the sense of focusing attention on key constructs and relationships, yet respects the complexity, for example the multidimensionality, of the issue and thus the inquiry.

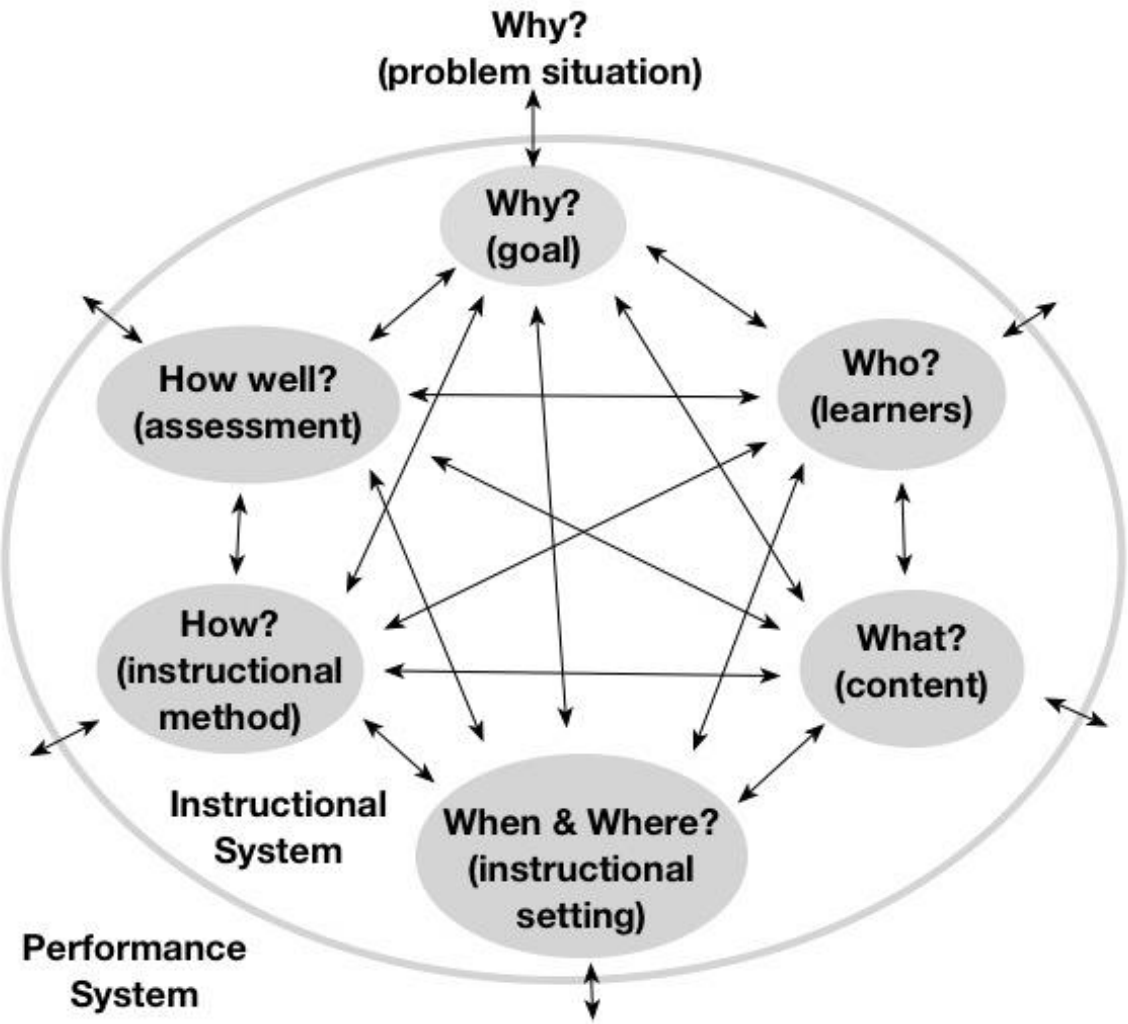

Figure 5. Systemic relations in instructional design.

Next steps

I am fascinated by the potential of inquiry systems, and my present version of design inquiry and the EDISYS tool may continue to be too simple. As Deetz (2009) puts it, approximating Ashby's (1958) Principle of Requisite Variety, "increased complexity of the problem requires increased diversity" (p. 8). The issues we face are incredibly complex. A possible step toward a more complex inquiry system is to add philosophical argument and political debate to scientific research and design, leading to what I have tentatively labeled an evolutionary inquiry system (Figure 6). These forms of inquiry actually map well onto EDISYS and add the questions *What should be?* and *What will be?* These could be placed by the core (What should be?) and between the system and environment (What will be?) in Figure 4.

Table 1. Evolutionary inquiry system.

fundamental question	what should be	what is	what might be	what will be
object of inquiry	values	natural world	artificial world	power
basic process	reflection	analysis	synthesis	evaluation
focus	problem	problem	solution	solution
outcome	criteria	theories	options	strategies
discipline	philosophy	science	design	politics

A second step that is essential is to develop a body of precedent material, which inquirers might use in the same manner as architects and graphic designers. Such precedent is lacking in my field, hence the call for design cases (Boling, 2010).

The two courses described above offer evidence that systemic design need not be the domain of only graduate study and professional practice. Undergraduate students—even those outside the design school—are capable of understanding and applying systemic design concepts and principles. My work implies that we can help them do so through such strategies as moving from concrete experience to abstract concepts and principles, engaging them with complex real-world issues, and scaffolding the two with inquiry systems and tools like EDISYS. By designing such systems and tools not to simplify, but to match the complexity of situations we expand their potential usefulness beyond pedagogy to practice.

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Appendix A. EDISYS questions

Questions to Strengthen Parts

ISSUE: The issue is clearly framed, that is, boundaries are clarified, particular aspects or things are selected for attention, and coherence is developed to guide further moves.
RESEARCH QUESTION: The question directly and in an unbiased manner focuses research on a key unknown(s).
FINDINGS: The findings clearly express something important and relevant that was unknown prior to research.
DESIGN GOAL: The goal clearly expresses the requirements of something of value that could be created through design.
ALTERNATIVE IDEAS: The ideas represent a wide range of possibilities.
DESIGN: The design is clearly described as a strategy, action, tool, or other form of intervention.

Questions to Strengthen Relationships

ENVIRONMENT←→ ISSUE: The issue is important in the systemic environment.
ISSUE ←→ RESEARCH QUESTION: The research question(s) focused attention on the key unknown(s) regarding the issue.
RESEARCH QUESTION ←→ FINDINGS: The methods measured what was intended and lead to valid/trustworthy answers to the question.
FINDINGS ←→ ISSUE: The findings offer new insights into the issue.
FINDINGS ←→ DESIGN GOAL: (a) The findings assisted in the identification of requirements for the design. (b) Requirements of the design are explicitly linked to research findings.
DESIGN GOAL ←→ ISSUE: Achieving the goal would resolve the issue.
DESIGN GOAL ←→ IDEAS: The goal inspired a sufficient range of ideas.
FINDINGS ←→ IDEAS: Ideas are related to findings in such a way that their strengths and limitations are obvious.
IDEAS ←→ DESIGN: The selected alternative has the greatest potential.
DESIGN ←→ DESIGN GOAL: The design satisfies the design goal.
DESIGN ←→ FINDINGS: Implementing the design would alter findings in the future.
DESIGN ←→ ISSUE: The design will resolve the issue.
DESIGN ←→ ENVIRONMENT: The design will have a positive impact in the systemic environment.

The Core

Worldview: What do you believe to be the nature of reality (ontological beliefs)? How do you assume humans come to know anything (epistemological assumptions)? To what types of actions, for example, inquiry methods, do these beliefs and assumptions lead (methodological choices)?
Values and ethical commitments: With respect to work in this area (e.g., in organizational communication and learning), what should be given priority and why?
Theoretical commitment(s): What theoretical lens(es) or way(s) of seeing have you adopted for this inquiry?
First Principles: What first principles of learning, instruction, performance, systems, and/or design do you seek to apply in this inquiry?

Questions to Strengthen the Core and the Overall System

Core ideas and metaphors: What core ideas or metaphors underlie your design and inquiry?
CORE: Beliefs, assumptions, and commitments are clearly articulated.
CORE ←→ ELEMENTS: The elements and the system as a whole are coherent with core beliefs, assumptions, and values. (An example of this would be a consideration of methodology—a rationale for one's choice of methods that connects to epistemological assumptions.)

[1] I use first person predominantly in this article not as a claim of originality but to enhance clarity and openly signify the subjective nature of my perspective of the contents (see, e.g., Lincoln, Y. S. & Guba, E. G., 1985, Naturalistic Inquiry. Newbury Park, CA: Sage Publications.)