An Organizational Analysis of the Future of Educational Technology

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In this special issue, the reader has the opportunity to examine an interesting and diverse set of futuristic scenarios from authors Bowie, Bratton, Knirk, and Reiser. It is a difficult intellectual challenge to compare and contrast them. However, I believe there is merit in such an analysis. There are provocative similarities and differences across the articles, and it seems they can be sharpened by a systematic, organizational analysis. The tool I have chosen is an organizational analysis method developed by some systems analysts a number of years ago (Kurpius, 1985). I currently use the tool as an intellectual template in analyzing complex development projects or assessing organizations for the suitability of organizational and instructional development interventions. The tool is broad enough to analyze these alternate futures and should provide one powerful, integrated perspective of all our authors' predictions.

As illustrated in Figure 1, the analysis tool is used to sort organizational dynamics into five primary categories. The environment, that is, forces external to an organization, is often most important. In many ways, the most significant determinants of our professional futures are outside of our control. We are not large enough as a profession to directly manipulate the organizational structures in which we reside. We may ultimately succeed or fail as a field according to our ability to capitalize on patterns and trends well beyond our immediate control.

We are comfortable in analyzing the purposes or *goals* of our client systems, and in recent years have become quite sensitive to the norms, values, and cultural factors that form the context for expressions of purpose. In some ways, our intellectual pursuit of needs analysis (Mayer & Kaufman, 1985) can be seen as an explicit recognition of the complex manner in which organizations express value, direction, and purpose. Some in our field have argued that our interventions are profound

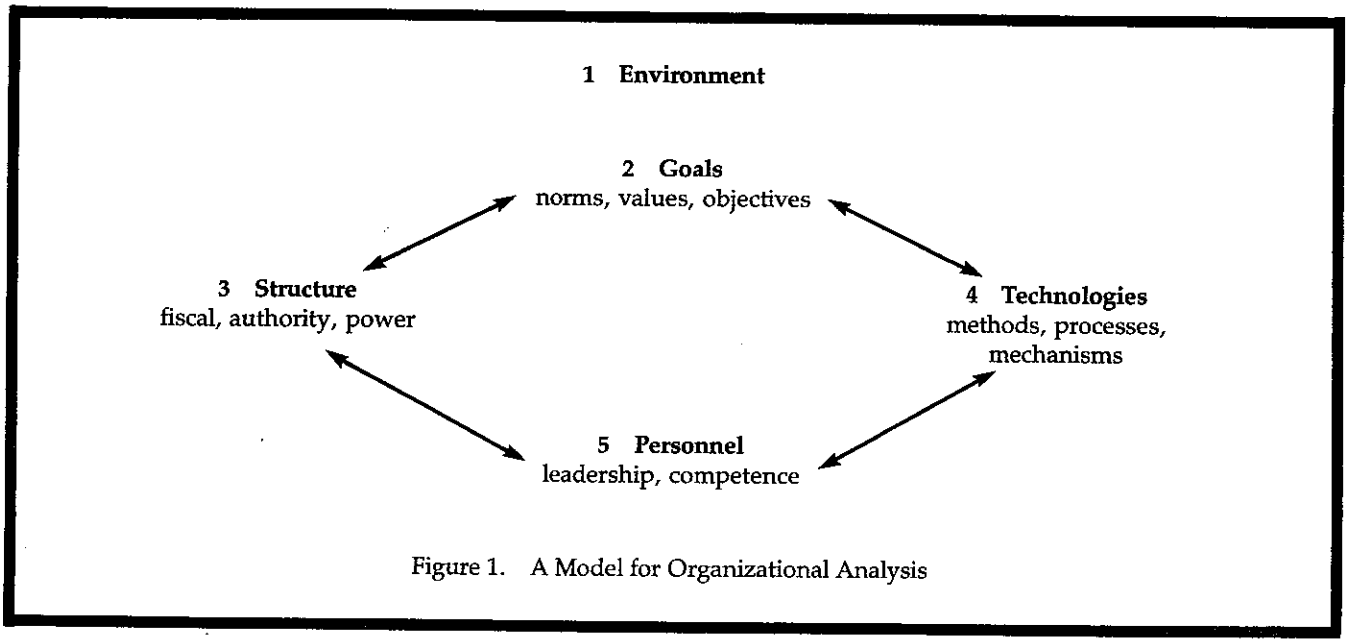

Figure 1. A Model for Organizational Analysis

enough to change the social context in which we perform (Schwen, et al., 1985). If this argument is accepted, we have a professional obligation to anticipate the consequences of our "social" interventions through methods such as needs assessment.

In the descriptions of alternate futures presented in this issue, our authors have engaged in relatively modest speculation about our goals in the future. I believe the authors implicitly argue that the goals of our organizations are more important than our professional goals. In addition, there is reasonable agreement about increased valuing of our profession because of the increased demand for training. There are mixed opinions about how our philosophy of teaching and learning will be valued in schools.

Issues of *structure* are universal in organizational analysis. Our futurists have raised the issue of our relationships as groups of professionals to the organizations in which we reside. The issue seems to be: Do we have enough status in our relative organizational hierarchies to effect the change we believe is appropriate or adequate?

The *methods* or technologies we use have been a profound source of introspection for years. We seem to be less articulate and sensitive as a field to alternate methods or processes for solving problems in complex organizational settings. The point of this sort of systems analysis is that we must step back and simultaneously inventory the strengths and weaknesses of all the methods, technologies, and processes that are in use when we choose to intervene in a new organizational setting. There are interesting differences among our authors as to the legitimacy and appropriateness of alternate methods, and this issue would profit from closer examination.

Personnel issues are classic points of departure in most organizational analyses. Our authors have expressed considerable concern in their alternate futures about the competence of those who use our tools. There is some speculation about developing the leadership potential of our field, particularly by exporting our tools for other personnel groups to use. There is also a kind of moral exhortation to adapt and to work harder to more effectively influence the organizations we inhabit.

These categories of organizational analysis are quite abstract. The power of using such a tool is in the organizational perspective. This analysis raises the issue of organizational determinism in our future. Can we reasonably predict how these dynamic structures and processes mold and shape our future? I have deliberately taken the position that these dynamics will be more influential than our philosophy or our aspirations. Also, the tool allows for some "modeling" of our organizational future. The weaknesses of such a method include a systematic organizational or sociological bias, and the loss of some of the unique or idiosyncratic predictions through adjusting all predictions to the same level of analysis. Perhaps a few useful questions emerge from the trade-off between the strengths and weaknesses of this method.

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Analysis of Environmental Predictions

Knirk speculates most about the environment. His major premises are the most generic, and they could be paraphrased as follows:

1. Our changing demographic patterns (the graying of America) will put differential stress on our schooling and training organizations. Schools will shrink. Training organizations will expand.
2. Biological and technological research and development will provide tools that will dramatically alter and enhance our professional practice.
3. The economy will respond to the changes in items one and two. Our educational structures will come under attack. Active and successful competition for funds will be necessary to create a promising future for our profession.
4. The general culture may demand more efficient and effective structures or alternative organizations to deliver educational services.

As noted earlier, the model of the environment outlined in this issue by Knirk and extended by Bowie and the others forecasts population shifts as the population grays, resulting in fewer school-age children. Technological, political, and economic change will follow the demographic change, creating increased pressures on our adult population for retraining. In the judgment of Bratton and Reiser, schools will become less hospitable to the current crop of educational technologists. Reiser, Knirk, and Bratton all argue that the influence of educational technology will be seen in the schools through the products and processes of educational technologists. In this view, technologists would constitute an external force because they will operate outside the organizational framework of schools. This position is reasonably consistent with Heinich's (1984) longstanding views on the matter. It seems important to come to grips with that point because it bears on a number of issues of national policy, professional organizations, and political alliances to influence funding.

In a manner of speaking, Bowie represents an internal, opposing model of change. She takes the position that librarians and information specialists are

the new breed of educational technologists in the schools. She argues that the expanded role of librarians, information specialists, and educational technologists will lead in the application of educational technology principles in schools. She argues for a change-from-within perspective.

These opposing views are rarely stated in professional dialogue. It is my view that the issue is critical for the organizational agenda of technologists in the future. It is, obviously, a matter of perceived competence and power. If educational technologists align themselves with librarians, as Bowie suggests, we have much unfinished business to attend to in our professional organizations. In this scenario, technologists would need to be convinced that librarians would be competent at using their approaches in schools. Or, if other alliances are important, we need to identify those leaders and segments of the schools we intend to influence with our methods and tools. At the present time there does not seem to be a clear vision or agenda forming about either view of the future. Perhaps the competition for the Center for Technology in Education offers a new opportunity for developing these and other scenarios for change in the schools.

It seems reasonable and safe to predict rapid developments in biological and technological research and development that will provide our professionals with more tools. However, one could take the position that our tools could become environmental or external forces (as postulated by Reiser and Knirk). Computer application tools, expert systems analysis, and related developments could allow us to put our most sophisticated analytic processes in the hands of far less sophisticated practitioners outside of our profession. There appears to be a revolution of that sort developing in the accounting profession (Shpilberg, 1986). Expert problem solving in tax planning, for example, is distilled and made available to business leaders, thereby markedly improving their performance. Exporting knowledge to education and training settings could dramatically alter our organizational agendas and subsequent relationships.

In closing this section on the environment, it is probably wise to question the most fundamental assumption of our authors: the demographic prediction about the graying of America. As I understand it, if one considers increased immigration pressure and differential birth rates by ethnic and socioeconomic class, we could very well see a dramatic shift in our population ratios in the 1990s. It is quite possible that we will have a reversal of status with black and Hispanic populations becoming the majority due to new births and immigration and the white population becoming the minority group. It's very hard to be as confident about the graying of "America" prediction under these circumstances. The environmental pressures on the organizational framework of the schools could include at least regional increases in the school-age population, with the additional issues of bilingual training and managing the problems correlated with low socioeconomic status of the school population. This scenario could include dramatic changes in demographic patterns and agendas for educational technologists.

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Analysis of Goals Predictions

The *goals* systems category is intended to be quite complex, including norms, values, and all forms of expression of intent including vision, purposes, and objectives. Simply stated, the orientation is that organizations express fundamental purposes in a wide variety of ways. The organizational analyst must be quite sensitive to the deeper context of these expressions to truly understand an organization's sense of purpose and identity. Our futurists have not explicitly devoted much of their predictions to this category. Reiser, Bowie, and Bratton have each made observations about the valuing of our professional perspective in schools. By implication, Knirk has raised issues of value that will change as our environment changes.

Paraphrasing the authors involves quite a bit of personal speculation. The following propositions seem to describe most of the authors' views, and some of my own:

1. The general societal values of efficiency and effectiveness will begin to break down current educational structures and hold them up to closer scrutiny.
2. The general cultural fascination with improved effectiveness and efficiency will allow us to share in new monies that will be available in our organizational frameworks.
3. The valuing of technology as a process will be linked to our effectiveness. Our effectiveness will be judged by our products and related teaching/learning processes. We will gain power to the degree that we become more effective and efficient.
4. Public education leaders may well value selected, highly visible products like computers and software, but not our professionals, as players in the public education process [Bowie's observations excepted]. Our professions' valuing of outcomes rather than methods will be more widely held by

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the clients of public educational systems than the leaders and players in these systems.

5. Our value and purpose in training and development settings is more traditional in one important sense. We become the educational system—teachers, designers, and evaluators—although we are not directly linked to the prime purpose of the organizations in which we reside, e.g., the prime purpose of a business is producing its product rather than training.

We have occupied an interesting values/purpose niche in our organizational history. In our first significant organizational niche, public and private education K–16, we were perceived as service providers to faculty, the primary actors. In this reconstructed view of history, we merged with a larger group, librarians, and in the synthesis became less identified with the process of teaching. As noted above, Bratton, Reiser, and Knirk each see the remaining professional hybrid as distinct from our field. Bowie argues that the new librarian has assimilated the old and new roles and values of the merged profession. In any event, all of our authors agree that there are fewer professionals in the schools. Bratton, Reiser, and Knirk see little opportunity for a direct, continuing professional role, while Bowie argues that the professional role is emerging along with changing political alliances. Bratton, Reiser, and Knirk seem to argue that our perspective on process and outcomes will not be valued enough to be institutionalized in professional positions.

In contrast, in training and development we see many professional roles in far more diverse organizational patterns, yet our value is instrumental rather than fundamental. In other words, we are seldom placed in organizations where the primary outcome is training. Our role is to help significant organizational actors learn more so they can produce more in the primary arena of delivering goods or services. In our second niche, we often serve in traditional roles of delivering instruction to clients. I am not convinced that our professions' valuing of technological processes leading to important outcomes is any better understood in the training and development niche than it has been understood or valued in public education.

Analysis of Structural Predictions

The *structures* systems category is as complex as the goals category. In typical organizational analyses, we are obviously interested in classic line-and-staff structures, but we are just as interested in formal and informal reference groups, assimilations of power, information networks, financial dispersion networks, and controlling and review structures. It is often the case that organizational structures are more fluid than our representations of them. It is often quite complicated to discern what are the "real" dynamics of structure. Certainly, with our bent toward practical technology, we have learned that the classic representations of organizational structures are often convenient fictions that bear little resemblance to the actual patterns of organizational relationships.

Although our authors did not expend much of their effort on the issue of structures, they have made a small number of interesting predictions. Paraphrasing their efforts with considerable license, the following propositions are offered:

1. The focus of power in our professional organizations will change:
a) Traditional school-based or affiliated organizations will continue to decline [Bowie's observations excepted].
b) Training and development organizations will continue to increase in size and complexity.
c) The power of influencing schools will move from our school-based organizations to more broadly based constituents and structures [Bowie].
d) Our professional organizations will become more specialized and less powerful [Bratton and Knirk].

2. Our status as service organizations may increase with the influence and cost of our technologies. Our expensive enterprises must be managed by highly placed or influential organizational units, thereby increasing our status and power.

3. The opposite prediction could be made: As our processes and products become more expensive, more traditional structures may own them as an expression of power and primacy of purpose.

4. Our success in training and development could result in our "restructuring" in higher education. Larger, more dominant units such as educational psychology (House & Bratton, 1986) could assimilate our smaller educational technology structures in higher education [Bratton].

If there is a lesson to be learned from American organizational history, it is that power is correlated with size, knowledge, and access to finance. Further, a minimal amount of power is necessary to affect the course of organizational accomplishments. We are not demographically a significant or powerful component in the organizational niches we occupy. The status of our structures reflect this fact. Further, our knowledge is not considered primary or essential in any of the major organizational settings in which we function.

Consequently, we usually operate in the instrumental middle ranges of organizational status or influence. Our access to financial resources is a function of competition with other priorities at the same or higher levels of status. Our tools, processes, and support systems are increasingly expensive and possibly powerful. We may be on the cusp of owning a larger share of our organizations or of being owned.

Analysis of Methodological Predictions

The methods of organizations are the generic *modus operandi*, the conceptual or technological solutions to salient problems. Often organizations that routinize and control the match of problems to applications and simultaneously contain the costs of their methods are most successful. The authors were quite provocative in their predictions about the future of our methods. In paraphrasing the predictions, the following are advanced:

1. Our scholarly methods will become more like mainstream academia. We will be judged like other scholars in higher education. Therefore, we will produce less products and more traditional scholarly products [Bratton].
2. Our methods of analysis and synthesis as well as our products will be disseminated to significant client systems. They will be more influential than our labor-intensive organizations that provide direct service [Reiser, Bratton, and Knirk].
3. Our personnel will become more eclectic than our scholarly traditions suggest. Management, developing funding, competency testing, and more product development skills may be required [Reiser].
4. Interactive technology processes will be in high demand [Bratton and Knirk].
5. Our conceptual process traditions will be the most sustaining or enduring approach to solving problems. Our affection for specific skills associated with hardware technologies may well be harmful, as it has been in the past [Bratton].

If we take seriously the current and projected demographics of our field, the only persuasive influence available to us in the future may be in the exporting of our intellectual tools. With the exception of developing significant model sites, no other organizational avenue seems open to us. Our academic traditions could be subsumed by other fields, our professional niches could be restructured by more powerful organizational elements, we could become indistinguishable as we are merged with other professions, e.g., librarians and computer applications specialists. One positive future scenario would be the distillation of our intellectual tools and their careful dissemination across the various educational organizations open to us. Reigeluth's (1988) notion of influencing textbook design is one example. Also, current extrapolations about distilling our intellectual processes in expert systems are plausible positive scenarios.

Analysis of Personnel Predictions

The personnel issues in organizational analysis focus on the appropriate matching of competence to work roles. Changes in our environment, predominant value systems, methods, and structures will all have a profound effect on both competency and situational variables. Our futurists' predictions relative to personnel may be the most speculative of all. In paraphrasing the wide variety of authors' predictions, the following seem most salient:

1. The challenge of leadership may be the most serious test for our field. Given the observations about our structures and our demographics, the litmus test of our future may be in the emergence of leaders who aspire to broader responsibilities and influence in the organizations we inhabit.
2. Our professionals will likely continue to be sought after in training and development posts in business and industry.
3. The schools will not provide satisfying professional roles for our technologists [Bowie's observations excepted].
4. Higher education will continue to decline as a prime setting for our professionals.
5. The traditional media production role of our field may be subsumed by other fields, e.g., telecommunications and commercial art.
6. Process/consultant roles will expand and sustain our field.

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There is an interesting professional angst abroad in our field concerning our future (Beckwith, 1988). This process of predicting the future certainly has complex psychological overtones. As a species, we seem to accept more credit for the sweep of human events than we apparently merit. Perhaps this is a natural, psychologically necessary process to maintain our sense of self, but I wonder whether the art of futurism is a quirk of human nature for *post hoc* rationalization. The apparent contradiction in terms could be explained by the following: We only have

the past and present to examine. We have a marvelous creative capability of playing infinite patterns and themes on the past and present. The only difference with scholars is that they speculate with formal rules and specialized terminology. We typically play the most favorable, optimistic, or self-serving themes. This process is predominantly one of managing fear rather than self-aggrandizement. We project our future in the least threatening manner and build our "reconstructions" of the past to avoid past failures.

As a profession, we have lost our unique role in schools, we are under continuing stress in higher education, we are finding considerable opportunity in training and development organizations, and we seem to have constructed a moral historic interpretation (Heinich, 1984) in which our successes, but mostly our "failures," can be attributed to our individual and professional actions [Reiser].

anarchical training mechanism in business and industry. We may not be influencing major trends at all. We may be nothing more than flotsam and jetsam in the intellectual history of training. There may be more merit in capitalizing on major trends than in imagining that we will singly or collectively influence those trends as a profession. The act of predicting the future may first and foremost be a process of defining goals that are remotely manageable. Given there is some merit in this hyperbole, the personnel predictions, stated as remotely manageable goals, would be:

1. To attempt to influence powerful personnel who have a chance to influence the schools, e.g., curriculum leaders or textbook publishers.
2. To address the rise and fall of personnel in higher education as an economic and political issue rather than an issue of personnel worth or morality.

We may have inadvertently killed off the artists in our academic organizations because they didn't fit into our social science mold.

We may be taking ourselves altogether too seriously. Much of our history may be a product of unrecognized organizational determinism [Bowie]. We may not be departing from a position of truth or right when we speak about our intellectual traditions (Heinich, 1984). We may have inadvertently killed off the artists in our academic organizations because they didn't fit into our social science mold [Bratton]. We may be succeeding in training and development because the environment is more chaotic [Knirk]. Perhaps our opportunism happens to be matched to the environment. We are probably a very small segment of an extremely large, complex, and Our size and the economic stress in higher education may be more explanatory than our professional practice.

3. To attempt to reach a higher plane of dialogue about training issues. We have a remote possibility of articulating the basic issues.
4. To give up the "Holy Grail" approach to defining technology and the proper roles of technologists (Heinich, 1984) and define the profession on the basis of what works in the field. Our scholars will, as they so often do, reconstruct our theories as we proceed (Clark, 1978).
5. To keep open the possible affiliation with other fields and disciplines, e.g., business and telecommunications, as well as the possibility of residing in other academic units.

Summary and Conclusion

Reanalyzing future scenarios from an organizational perspective introduces a provocative bias into the discussion. At some level, the perspective shifts from philosophic and psychological issues to sociological ones. This isn't entirely true, of course, but there seems to be an interpretable pattern. The future of educational technology becomes delimited by environmental issues that determine the future of the *organizations in which we reside.* Schools, higher education, training and development units within organizations, and business, industrial, and various other organizations will undergo quite different economic, demographic, political, technical, and social stress in the next twenty years. Our future as a profession may be most dependent on defining trends at that level of analysis rather than at the level of our professional practice.

With considerably fewer degrees of freedom, we can predict and perhaps manage our futures in the organizational settings. Since we are seldom primary in defining the most basic goals or purposes of the organizations in which we reside, I have argued that our values and world view will often be dominated by the basic purposes of the organizations which we inhabit. Despite our rhetoric, we have not added our agenda to the fundamental purposes of many of those organizations. We are a part of the instrumental rather than the primary or substantive goal-setting processes.

The implication of this is that our vision of the future may be quite unrealistic or poorly matched to future trends well beyond our influence. Although it is axiomatic that idealism is a desirable trait in our culture, one wonders if the old joke about the gnat crawling up the leg of an elephant for purposes of sexual gratification has relevance here. Our professional success may be less a function of manipulating the future than of anticipating and opportunistically reacting to it.

The structures we inhabit are uniformly of middle to low status in our organizational settings. We are often well outside of the powerful inner circle

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of decision makers. This observation is one of utility rather than value or pessimism. As our tools, techniques, and technologies become more expensive and more central to our organizations, our organizational status may improve. However, these will be the times in which other larger and more powerful structures may attempt to subsume us or merge with us as a natural exercise of power and continuity. This is a plausible interpretation of what happened in the schools with media specialists and librarians. We are not a large demographic subset of most structures we inhabit, and there are predictable, normative consequences that flow from this fact.

Our methods, tools, and philosophy may be potent enough to export and thereby influence much larger educational structures. The new tools of expert systems analysis and the natural advantage of our technological approach may offer us a wider influence than our size would first indicate. Issues of uniqueness, competing sources of knowledge, and control of the organizational environment through certification processes would come to bear on this potential influence. We can optimistically project influence in this vein. The test is whether significant talent in our profession will be focused on such an agenda.

For many of our professionals, current personnel issues seem to revolve around who is in or out of the circle of educational technologists. Larry Lipsitz (1988) recently spoke to a national meeting arguing that the "field" defined by those active and publishing may no longer be definable by certification, training programs, or degrees. He was unable to define leaders by these conventional means. I have argued that future personnel issues may require far more flexible and dynamic alliances between and among "technologists," professionals, and educational leaders. We run the risk of losing our identity, but we are in the midst of a fast and furious process and may have no other choice but to build our future on influence rather than direct participation and control.

In closing, I would assert that the process of "predicting" our future is a valuable, provocative form of scholarship that is essential to our growth and development as a field. Bowie, Bratton, Knirk, and Reiser are to be commended for their efforts. We must take the intellectual risk of building future scenarios if we are to grow and develop as a profession. To ignore this form of scholarship is to concede our future to random and systematic variables we neither understand nor have attempted to anticipate or modify. I hope this special issue will elicit further dialogue and scholarship.

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