Transdisciplinarity: Trying to Cross Boundaries

Helène S. Fine
Bridgewater State College
Bridgewate, MA, U.S.

ABSTRACT

This paper explores the concept of transdisciplinarity, seeing it more as a useful framework than as a distinctly different research approach. As such it can help professionals from a full range of fields and people from all walks of life work together across the boundaries that normally separate them. The boundaries between the sciences and other fields are of the most concern. Because off this, transdisciplinarity is often equated to   Mode 2 Science; i.e., science that engages with humans to solve problems together out in the world. A major concern here is with the strength of prevailing beliefs about the value of expertise and the importance of the specialized division of labor. These are viewed as important tools in the struggle to control one's own work. Of equal concern is the opposite danger that the topic will reify and become just one more academic discipline. Personal examples as well as an analysis of the literature on industrial sociology, the sociology of occupations and professions as well as that on transdisciplinarity itself are presented in this exploration

INTRODUCTION

The concept of transdisciplinarity has surfaced in a number of different knowledge generating channels and in a range of geographic regions (Chan et al. 2006; Nowotny, 2003; MacMynowski, 2007.) While there are different thoughts about the concept's meaning and effectiveness, there is substantial agreement on its appeal.   It would be hard to resist an approach to solving human problems that brings us together across the boundaries of academic disciplines, occupations and professions, or even across different social strata. At the same time it is not entirely clear that any concept, even one as appealing as transdisciplinarity, can really enable us to transcend our individual differences and enable us to identify, let alone correct, the problems that we face together as human beings (Zierhofer and Burger, 2007).   Within the literature there is even some question of whether transdisciplinarity is a specific mode of knowledge production (Zierhofer and Burger, 2007). What is clear is that it expresses a longing for a lost world - one where people of all walks of life can live, work, and play together (Nowotny, 2003; Steinmetz, 2007; Chan et al. 2006).

As someone who has worked across economic, social, environmental, and political boundaries to bring about change at a regional level while incorporating these experiences as the content for academic work in a school of business, transdisciplinarity, however we define it, is most welcome. At the same time, my immersion in organizational change efforts as well as in the study of that change makes me all too cognizant of the inherent difficulty of challenging the mainstream tendency to compartmentalize information, knowledge and experience. Quite to the contrary, people seem to be quite ready to abide by t h e cultural norm of placing a high value on specialization and expertise. They are all too willing to engage in the process of establishing themselves as experts while also conferring expertise on others. At the other extreme I share the worry of some that transdisciplinarity will itself become yet another stand-alone discipline (Nowotny, 2003). This would contradict the spirit of the construct, which implies a repeated tearing down of the boundaries that separate existing disciplines, coupled with a continuous generation of new modes of thinking. Moving between my two concerns of the practicality of achieving

transdisciplinarity in this culture, on the one hand, and the tendency toward reifying and ossifying it, on the other, I can nevertheless embrace transdisciplinarity as an excellent framework with which to explore and resolve complex issues. Without worrying overly much about its exact nature or about whether it represents a fleeting mode of analysis, a process, or just a different way of thinking I will explore its meaning further and, mainly, try to determine just how workable a concept transdisciplinarity is.

Overview

This paper will begin with some examples from the transdisciplinarity literature. It will then turn to some early literature on industrial sociology, drawing from this some social constructs that favor the acquisition of specialized knowledge and expertise, particularly technical expertise, and that confer status on and give power to those that have it. Included in this review will be material from the sociology of occupations and professions as well as from some neo Marxist analyses of this field. In addition to reviewing some earlier sociological writing, the paper will recount both personal and professional experiences that illustrate the challenges faced by those trying to work with transdisciplinary approaches to change. The paper will conclude by accepting transdisciplinarity as a fluid continuous process of transgressing existing boundaries - one that is not yet encased in either a particular methodology or in a field of its own.

TRANSDISCIPLINARITY

Depth and Breadth of its Appeal

A Google search followed by one of some library electronic databases yielded articles that revealed deep interest in the topic at hand. The overarching theme that emerged is that of the expressly felt need for the concept of transdisciplinarity. This need stems from the changing nature of knowledge production and the resulting importance of trying to understand knowledge production in the new terms. Transdisciplinarity, as a

result, generally exists at a particular new place; namely, at the interface between a social and another science (Chan et al, 2007; Nowotny, 2003; MacMynowski, 2007). In fact, the recognition of the change often leads to the definition of transdisciplinarity as a research methodology that is the equivalent of a different mode of science known as Mode 2. There is, however, other work that takes exception to this view. For those who adhere to the Mode 2 view, transdisciplinarity reconnects science to humanity and as its adherents attempt to solve urgent human problems, they create a new field that is greater than the sum of the different fields that come together in the search for solutions (Nowotny, 2007). Those who take exception to this view question the idea that transdisciplinarity is even a distinct approach, let alone a feasible one (Zierhofer and Burger, 2007).

There are also other exceptions to the science methodology definition. The definition put forth in Tamara's call for papers is one of these (http://www.peaceaware.com/tamara/calls/index.htm); another is one that just uses the idea of transdisciplinarity to expand sociology so that it includes all human endeavors. (Steinmetz, 2007).

Finally, there is evidence of an interest in transdisciplinarity (although not necessarily by name) outside the academic research methodology sphere. Two that I would like to mention are the Berkman Center for Internet & Society at Harvard Law School and the soon to open Microsoft Research New England lab. The former brings together "…faculty, students, fellows, and entrepreneurs working at the intersection of technology, law, business, and social sciences" (http://cyber.law.harvard.edu/home/); the latter plans to "…create new fields at the boundary of computer science and the social sciences" (http://research.microsoft.com/news/featurestories/publish/Chayes-Borg.aspx).

Working Definition

Although there does not seem to be a good reason to pin the term transdisciplinarity down too tightly and, conversely, there are many to keep it loose, I will adopt an operational definition for purposes of this paper. Transdisciplinarity here will refer to a process of integrating different approaches to resolving complex, real world problems in a humanly satisfactory way. Although these approaches generally are used by academic researchers that is not a condition for inclusion in this category. Beyond functioning as a contemporary research tool, transdisciplinarity should strive to draw people from dramatically different backgrounds into a team effort that they can all accept as legitimate.

PREVAILING SOCIAL CONSTRUCTS

Genesis of the Prevailing Constructs Unfavorable to Transdisciplinarity

The resistance to transdisciplinarity stems from a number of sources including many that can be understood with reference to some early work in sociology, particularly Marxian industrial sociology and the sociology of occupations and professions. The Marxians put forth a number of ideas, including the following:
☐ With the transfer of power from the aristocracy to the bourgeoisie, those members of society who have successfully served the former ruling class now had to regroup and find a way to sell their services to the newly emerging ruling class.
☐ They did this by offering their skills as the rationale for becoming providers of services to the latter.
☐ Their training and education as professionals provided the skills and enable them to meet the new standard of merit.
☐ The result was the rise of a professional class that staked its claim to legitimacy on its command of esoteric knowledge; i.e. its expertise.

The claim to expertise, for example, enabled those in the medical profession to take power from the herbalists and midwives that had always served the ordinary people. This despite the fact that the professional physician was more likely to kill than cure his patients while the holistic practitioners genuinely helped them (Adrienne Rich, 1995; Margali Larsen, 1977).

While a transfer of power at the macro level was playing itself out in the struggle for legitimacy for professionals to serve the newly emerging middle classes, a similar struggle was going on at the micro level of the workplace.

Other Marxian writers, in their role as ethnographers situated themselves right inside the workplace. As participant/observers they wee able to document the workers' struggle for control of their own work. Not only did the workers ultimately lose but also this struggle ultimately became a continuous process wherein the managers and owners of capital try to remove power from those who do the work and lodge it in the hands of those who oversee and/or benefit from it.

In response to the loss of control, the workers to find ways to take it back. They do this by developing mechanisms for imparting meaning to work in the form of "games" and "making out". To an outsider the meaning might not be clear but it is who work inside these intricate systems (Burawoy, 1979). The struggle continues with those on the top (at least relatively) successively and excessively dividing the tasks of labor. This in turn results in the proletarization of white-collar work (Braverman, 1974). Ultimately control is removed from professionals who become the new laborers.

Historian of technology, David Noble, sees the development of technology as a weapon in the struggle for dominance over work. He makes a convincing case for the fact that even the decision to move away

from analogue to digital technologies was a clear attempt to remove control (and, of course, power) from the skilled machinists and lodge it with the more reliable engineers. (Noble, 1984) Noble agrees with Marxian Industrial Engineer, Seymour Melman, that educational and industrial institutions are more concerned with "command and control" than they are with performance! (Melman, 1971; Noble, 1984)

Finally, there arose within the United States a comprehensive culture of professionalism. With the denial of class and privilege as a factor in occupational selection and mobility merit derived from education, experience, and training formed the basis of control and legitimacy. This hastened the development of a whole culture of professionalism (Bledstein, 1978). The early ethnographers who ultimately entered the training and educational institutions with the prospective professionals attested to the power of education to provide the socialization needed for the new industrial order (Becker, Geer, Hughes, and Strauss, 1961).

The Ethos of Professionalism

The relevant sociological literature, then, revealed a set of beliefs that professionals hold about the work that they do. These include the belief that their claim to control of this work rests on:
1.   Their training.
2.   Their command of esoteric knowledge.
3.   The importance of bringing this knowledge to bear on the problems that their clients, customers, or patients bring to them.
4.   Their superior ability that has been proven by the selection process that they have undergone.

All these factors make them specialists and even experts. They help hem rationalize their claim to power over their own sphere. These, in turn, lead to their feeling of satisfaction with what they do. Because of their belief in the social importance of their skills and their work, they have no qualms about charging fees for their services or accepting the admiration of others. The socialization process that education and training accomplishes, enables them to define themselves and their colleagues as insiders and relegate all others to the role of outsiders. Once they do this, they do not take seriously any judgment about their work that is given by these outsiders. Often their expertise transfers to fields well beyond their own.

The claiming of expertise and with it power spills over into occupations that the society does not always identify as professional. The work of the police, the military, and even that of housewife may also appear to be the basis of expertise by those who perform it. I have been in many a kitchen where the woman of the house claims total control and is wedded to a specific (correct) way of organizing a meal. Administrative assistants in hospitals and universities are generally the only ones who understand how the organization really works, what person in a given office will be able to perform a particular task, and how to locate an important record. It goes without saying that only the custodial staff is allowed to touch a thermostat!

There is a problem for the professional here, however, in that the field of professionals is a fluid one. New work enters as the old loses ground. Medical doctors, for example, once reigned supreme. Now Healthcare and other CEO's often best them. A loss of both status and wealth has driven people away from choosing this profession. Loss of control over the work has hastened the exodus of those already in it.

Loss of control over one's work is another issue that was a topic of great concern to early industrial sociologists. It is worth revisiting this matter here.

The Elevation of Expertise and the Struggle for Control

As I noted above, Marxian sociologists and historians of technology documented the struggle for control of work quite well. Despite evidence that skilled craftsmen traditionally had a significant role in production itself as well as in the design and development of machine tools needed for production, management repeatedly chose to ignore this and bypass them in the development of newer sets of tools. This resulted in the deskilling of existing work and in the elevation of new skills for production. These new ones were then lodged with engineers and other technical professionals (Noble, 1984). This process continued until even technical professionals began to lose ground.

With control over their own work continuously undermined it is not surprising that professionals now feel the need to keep trying to reassert themselves as experts whose advice others should heed. When contemporary information technology consultants, for example, complain about the older computer scientists for being irrationally attached to their own software designs they are unwittingly documenting a small part of this struggle for control. An integrated information system or decision support system might well be more efficient but with the implementation of one, control slips away from the technical professional. Resistance to this change is - and, perhaps, ought to be - - the norm, not the exception.

STORIES TO ILLUSTRATE THE POWER OF EXPERTISE

From Academia

Some years ago my then husband and I were invited to dinner at the home of a London professor. This professor and my ex-husband were both reasonably well known in their respective fields of philosophy. The former had a specialty in aesthetics; the latter, in the philosophy of science. At the time I was a fairly serious, practicing artist. The London professor and I became totally engaged in a conversation about contemporary art, thereby violating the rules of British polite society which mandates equal conversation time with the person seated on each side of you. A few days later, a package addressed to my ex husband arrived. In it was a manuscript for a book about Freud and art as well as a note from our London host inviting my ex husband to write a review of this work for the Times of London! Not only was this way beyond my ex's field of study, but also because he had never been part of our conversation, the professor had no way of knowing whether he had either the interest or the knowledge to offer a reasonable review. I, on the other hand, had revealed that I had both. I did not, however, have the academic credentials and hence, lacked the expertise that he needed.

From the Political and Economic Realm

Lest I be accused of sour grapes, let me offer a story about an instance when others attempted to confer the power of expertise on me. There have been many such cases but I will present a brief a summary of just one. This took place in Ithaca, New York more than thirty five-years ago.

In Ithaca I ran for city office on a third party ticket. I did this as part of a larger protest against the two major parties because of their poor choices of candidates. For reasons that I won't go into I was awarded free radio time each week for fourteen weeks. I used this to speak out quite strongly (and even militantly) against the top down, big business approach to urban renewal - which we referred to as urban removal - that was about to be pushed through local government. My ending tag line was, "This is (my name) saying it is time to return power to the people!" This resonated better than any of us in our third party expected and I become a celebrity almost over night. As a result, I was

invited to appear on local television and radio talk shows and in panel discussions around the city. After a short time of this, spokespeople from the newspapers, radio, television, and many different organizations often approached me to speak on subjects that had nothing to do with the areas of my expertise that included the arts, education, and economic development. It was clear that my expertise on these topics was enough for some to confer expertise on me for others that were far removed from anything in my repertoire.

Examples from Teaching

When I used to teach math based courses like quantitative methods, I generally began by citing literature that shows that students who work in small groups have a better track record for learning math than those who study alone. I would then place them in teams and repeatedly encourage them to use team members as study partners. One time a student irately exclaimed on the evaluation sheet, "She didn't teach me a thing. It was my classmates not the teacher who taught me everything I know!" I had clearly shirked my role as expert!

More recently I generally lead my graduate students in a product development process class through the development of an actual product. During one semester last year I had them complete all the background research for creating a hybrid, alternative energy, flexible minibus system. They investigated the appropriate technologies, located potential bus companies, planned a marketing campaign, did a preliminary feasibility study and presented their plan at a graduate student symposium. This brought them rave reviews. Yet two of them complained that I hadn't taught them anything. Once again, in their minds, I hadn't transferred any of my expertise to them.

CONCLUSION

As I indicated at the beginning of this paper, I view transdisciplinarity primarily as a useful mechanism or process for bringing together people from different disciplines and walks of life to identify and begin to resolve mutually troublesome problems. It could also help establish a mode of operating that encourages mutual respect for different perspectives as well as a genuine regard for these differences. With time we might also be able to reinforce the belief that the results of engaging in this process are better than those achieved in other ways.

As Nowotny has already noted, working together in this way will require great patience (Nowotny, 2003). I would also add that it will require time, an appreciation of the benefit of incremental change, and a willingness for all of us to join one another in relinquishing whatever advantages our own claim to expertise has offered. We will not find it easy to ignore the social ethos of professionalism that pervades our culture.

By biggest concern, however, is with the opposite issue that I noted in the introduction; namely, the tendency to reify a new concept until it ossifies. There is already a hint of that in the literature that often relies on the prevailing modes of analysis within a given discipline to decide whether transdisciplinarity is really a new mode or whether the knowledge yielded is really an improvement over what results from he application of a single type of analysis (Zierhofer and Burger, 2007).

As long as we remain aware of the two sets of problems, however, and agree to use transdisciplinarity as a continuously changing process for pooling our respective modes of analysis and synthesis so that we can transcend them, we should be able to make good use of it.

Fine

REFERENCES

Becker, H. S., Geer, B., Hughes, E. C. & Strauss, A. (1961). Boys in white. Chicago: University of Chicago Press.

Bledstein, B. J. (1978). *The culture of professionalism: the middle class and the development of higher education in America*. London: W. W. Norton.

Braverman, Harry (1974) *Labor and monopoly capital: the degradation of work in the twentieth century*. New York: Monthly Review Press.

Burawoy, M. (1979). *Manufacturing consent: Changes in the labor process under monopoly capitalism.* Chicago: University of Chicago Press.

Chan, K M.A., Pringle,R.M., Ranganathan, J, Boggs, C.L., Chan, Y. L., Ehrlich, P.R. et al . (2007). When agents collide: human welfare and biological conservation. *Conservation Biology* 21 (1): 59-68.

Larson, M. S. (1979). The rise of professionalism: a sociological analysis. Berkeley: University of California Press.

MacMynowski, Dena P. (2007). Power and knowledge at the meeting of social and biophysical Science. *Ecology and Society* 12 (1): 20.

Melman, S. (1971). The war economy of the United States: Readings on military industry and economy. New York: St. Martin's Press.

Noble, D. (1984). *Forces of production: A social history of industrial automation.* New York: Oxford University Press.

Nowotny, Helga. (2003). The potential of transdisciplinarity: Rethinking interdisciplinarity: an electronic conference. http://www.interdisciplines.org/interdisciplinarity/papers/5. Retrieved on 2/05/08.

Rich, Adrienne (1995). *Of woman born*. New York: W. W. Norton andCompany.

Steinmetz, G. (2007). Transdisciplinarity as a nonimperial encounter: For an open sociology. *Thesis Eleven*, 91, 48-65.

Zierhofer, W. & Burger, P. (2007). *Disentangling transdisciplinarity: An analysis of knowledge integration in problem-oriented research*. Science Studies 20 (1), 51-74.