Fall 11-15-2001

Generating environmental knowledge and inquiry through workshop processes

Peter J. Taylor
University of Massachusetts Boston, peter.taylor@umb.edu

WORKING PAPER on Science in a Changing World

Paper # 6 -2001

Generating environmental knowledge and inquiry through workshop processes

PETER J. TAYLOR

GRADUATE PROGRAM IN CRITICAL AND CREATIVE THINKING
University of Massachusetts, Boston, MA 02125, USA
http://scholarworks.umb.edu/cct_sicw/6

Generating environmental knowledge and inquiry through workshop processes

Peter J. Taylor
Program in Critical and Creative Thinking
Graduate College of Education, University of Massachusetts, Boston, MA 02125, USA
peter.taylor@umb.edu
November 2001

Abstract

Since the late-1980s many scholars in Science and Technology Studies have accounted for the validity of scientific knowledge or the effectiveness of technologies by discussing the heterogeneous resources mobilized by diverse agents spanning different realms of social action. In the environmental arena such "heterogeneous construction" is, in effect, self-consciously organized through the frequent use of workshops and other "organized multi-person collaborative processes" (OMPCPs). This paper describes my own process of making sense of the workshop form for generating environmental knowledge and further inquiry. This process was catalyzed by participating during the spring and summer of 2000 in four innovative, interdisciplinary workshops. By reflecting on these workshops and drawing on other experience I identified six angles for thinking about why a workshop (or OMPCP) might be needed to address the complexity of environmental issues. The angles relate both to establishing knowledge ("product" in the paper title) and to developing the capacity for further inquiry ("process") through participation in OMPCPs ("process").

Introduction

How do people establish scientific knowledge or the effectiveness of technologies? Since the late 1980s many writers in the social studies of science and technology (STS) have accounted for this in terms of heterogeneous resources mobilized by diverse agents spanning different realms of social action (Law 1986, Latour 1987, Clarke and Fujimura 1992), that is, what I call "heterogeneous construction" (Taylor 1995). In the environmental arena heterogeneous construction is, in effect, self-consciously organized through the frequent use of workshops and other "organized multi-person collaborative processes" (OMPCPs). This paper describes my own process of making sense of the workshop form for generating environmental knowledge and further inquiry.

Before proceeding, notice that heterogeneous construction expands the object of inquiry to include the actual process of generating knowledge, not only the final product (*contra* the conceptual primacy

philosophy of science still gives to justification over discovery). Moreover, the heterogeneity of resources, agents, and realms of social action means that it is not possible for that process to contribute solely to the generation of knowledge. There are always many other products, one of which is highlighted in this paper, namely, the capacity to pursue further inquiry. Thus "knowledge and inquiry" in the title. (Science educators face an equivalent tension between conveying established product and generating capacity to inquire.)

My process of making sense of the workshop form was catalyzed by participating during the spring and summer of 2000 in four innovative, interdisciplinary workshops. By reflecting on these workshops and drawing on other experience I identified six angles for thinking about why a workshop (or OMPCP) might be needed to address the complexity of environmental issues. I used the six angles to review the four workshops. This led me to dig deeper into how workshops work when they do work and to assemble a list of heuristics and some open-ended questioning. One of these heuristics, as will become evident shortly, involves making space for the audience to bring their own knowledge to the surface. One member of the audience for my first presentation on this topic offered to help me develop a more systematic set of principles for bringing about successful workshops. The outcome, included as an appendix, provides a basis for further inquiry on workshops and the process-product relationship more generally.[1]

Warming up audience involvement: Two contrasting cases

Before I describe the four workshops or the six angles with which I reviewed them, I want to make space for readers' thinking about the process and product of environmental analysis. My intention is to engage readers--perhaps critically--with what I subsequently present. This involves an exercise, preceded, in order to warm up your thoughts, by a brief account of two contrasting cases.

Case 1: As a young researcher I was hired by the "Institute"--an economic and social research organization based in Melbourne, the major city of the southern Australian state of Victoria--to help undertake a detailed analysis of the future of a salt-affected irrigation region. The Kerang region, 240 kilometers north of Melbourne, is an agricultural region where farmers irrigate some pasture, for grazing by beef or dairy cattle and sheep, and irrigate some crops. Soil salinization is a chronic problem; during the middle 1970s, after some very wet years, the problem was acute. The rise in salinity, following a decline in beef prices, threatened the economic viability of the region. In late 1977 the Ministry of the state government responsible for water resources commissioned the Institute's study. An agricultural economist from the Ministry and the principal investigator from the Institute formulated a project to evaluate different government policies, such as funding regional drainage systems, reallocating water rights, and raising water charges. This evaluation would take into account possible changes in farming practices, such as improvements in irrigation layout, drainage, and water management, and changes in the mix of farm enterprises. The analysis was to be repeated for different macroeconomic scenarios as projected by the

Institute's national forecasting models.

The central part of the project--my main task--was the construction of the Kerang Farm Model (KFM), which, using an optimization technique called linear programming, would determine for representative farms the mix of farming activities that produced the most income. Different factors, such as water allocation, could be changed and the effect on the income and mix of activities ascertained. Although some refinements were omitted to meet the Ministry's deadline, the KFM was sufficiently flexible to allow evaluation of the required range of factors, yet not so complex so as to be unmanageable.

At the public meeting to present the study's findings some local agricultural extension officers raised objections to the study's having endorsed irrigation of pasture over irrigation of crops. This ran contrary to the advice they had been giving to farmers ever since the decline in beef prices. Subsequent reanalysis, incorporating generous increases in crop yields into the KFM's parameters, was completed rapidly. The result favoring pasture irrigation was robust and could be attributed to beef prices having recovered by this time in the late 1970s. The Ministry, meanwhile, focused its attention simply on results indicating that water charges were not a primary limiting factor on farm enterprises or viability. These results eclipsed others concerning the larger range of options that the Institute had been commissioned to analyze and additional issues about the environmental future of the region that emerged during the study. Their focus suggests that justifying an increase in water charges had been the Ministry's primary concern all along. In any case, the Ministry was unable to implement this change and nothing more then became of our analysis (Taylor 1995).

Case 2: Three years ago I made time to begin facilitation training with the Canadian Institute of Cultural Affairs (ICA). ICA's techniques have been developed through several decades of "facilitating a culture of participation" in community and institutional development. Their work anticipated and now exemplifies the post-Cold War emphasis on a vigorous civil society. ICA workshops elicit participation in planning in a way that bring insights to the surface and ensures the full range of participants are invested in collaborating to bring the resulting plan to fruition (Burbridge 1997, Spencer 1988, Stanfield 1997).[2]

This outcome was evident, for example, in community-wide planning during 1993 in the West Nipissing region of Ontario (300 kilometers north of Toronto), sponsored by the Economic Development Commission (EDC). At that time, industry closings had increased the traditionally high unemployment to crisis levels. Although the projects resulting from the 1993 planning process are too numerous to detail, a follow-up six years later concluded that there were many accomplishments in the areas the process had identified. Overall, the economic base was stronger and more diversified, depending less on provincial and national government social welfare programs. Moreover, the initial projects spawned many others, allowing the EDC to shift from a superintending role to that of a catalyst. The community now sees itself

as responsible for these initiatives and developments; the initial EDC-ICA planning process has become lost in the past (West Nipissing Economic Development Corporation 1993, 1999).

Although the economic future is the focus of both these cases, the contrast between them raises many issues shared in environmental analyses. I tease these issues out later in the paper. For now, it is time for the exercise.

Guided freewriting about workshop experiences

Freewriting is a powerful way to clear mental space so that thoughts about an issue can emerge that had been below the surface of your attention. In a freewriting exercise, you should not take your pen off the paper. Keep writing even if you find yourself stating over and over again, "I don't know what to say." What you write won't be seen by anyone else, so do not go back to tidy up sentences, grammar, spelling. You will probably diverge from the topic, at least for a time while you acknowledge other preoccupations. That's OK--it is one of the purposes of the exercise. However, if you keep writing for seven to ten minutes, you will probably be pleasurably impressed by the insights you have (or remind yourself of)--that is another of the aims of the exercise (Elbow 1981). For those of you who are rolling your eyes and are tempted to skip the exercise, let me ask you to subject your skepticism to empirical test and try it. Please continue for seven minutes where this sentence leads off: "When I look back on workshops in which I have felt really engaged--or, from the negative side, really disengaged--the thoughts or feelings or experiences that come to mind include..."

Now draw a line and identify a workshop in which you were really engaged. Finally, formulate a word or short phrase that captures what made the workshop work for you. Email that to me if you can. The exercise is over.

Six angles on the need for workshops—or organized multi-person collaborative processes

As mentioned in the introduction my reflection on workshops led me to identify six angles for thinking about why a workshop (or OMPCP) might be needed in some environmental issue:

a. The knowledge and research skills of more than one person are needed, as recognized in particular when multi-disciplinary teams are established.

b. More than one party is involved in the environmental issue, as recognized when meetings include stakeholder representatives.
c. Environmental complexity requires ongoing assessment (as against a one-time analysis) and so an ongoing organization or group is needed to conduct the assessment, as recognized in in the field of Adaptive Environmental Assessment and Management (AEAM).[3]
d. Knowledge can be generated that is greater than any single participant or sum of participants came in with, by, for example, bringing unacknowledged knowledge to the surface.
e. To ensure investment in the product of the collaboration, which might include ongoing collaboration.
f. To create greater capacity for productive engagement in OMPCPs.

Let me review the Kerang and West Nipissing cases from these angles.

	Kerang	**Nipissing**
> 1 person's knowledge and research skills needed	Y*	Y
> 1 party involved in environmental issue	X	Y
Conduct ongoing assessment that environmental complexity necessitates	X	Y
create knowledge > sum of participants' > any single participant's	X	Y
ensure investment in the product of the collaboration	X	Y
create capacity for productive engagement in multi-party collaborations	X	Y

(* circumscribed fields only)

It is not surprising that the Kerang study scores so few Ys. It was not set up as a OMPC*Process*. There was a multi-person collaboration, but we had a clear division of labor and our collaboration was not expected to change the questions or the character of the product. Against this backdrop, let me now describe each of the four interdisciplinary environmental workshops I attended and review them in light of the six angles.

Four interdisciplinary environmental workshops

1. "Rethinking the 'and' in 'Humans and Nature': Ecology at the Boundary of Human Systems," Santa Barbara, 10-13 March 2000

Innovative features: The diversity of participants—from Native American studies to Sociologist of boundary work in science. Role for facilitator-participant. Apparent openness to group defining its favored process and product.
Organizer (O): Gay Bradshaw, Visiting Researcher, National Center for Ecological Synthesis and Research (NCEAS), 1999-2000, with assistance from Denise Lach, Center for Interdisciplinary Studies, Oregon State.
Facilitator (F): Denise Lach

Program

	Morning	Afternoon	Evening
Pre-workshop	Participants contributed key articles for others to read, but these were not distributed in advance		
Day 1	Introductions from F on dialogue & ground rules	O on one possible product being the process of interaction, once that is articulated & communicated. Group (hereon: G; led by O): Different approaches explored using restoration ecology as a shared case.	Social, in small groups
Day 2	(O nixed suggestion by F and others for sessions in which participants would learn from each other.) F: More on dialogue O: What do we want to say to the outside? -> G: Discussion	G: More discussion	Social, in small groups
Day 3	O: Needed--Synthesis, Achieving visions & Communication G: Discussion on role of narrative (re-story-ing)	G: More discussion	Social, as whole group
Day 4	F: Reflection on becoming ready to speak O: Product needed -> G: Work on one participant's suggestion--American Science Foundation (ASF) founding document ("Declaration of Independence")	G: ASF proposal & farewells	--
Post-workshop	Key articles still not distributed. OpEd by O & another participant in Denver Post (July). A well-attended symposium at the August meetings of the Ecological Society of America included six of the workshop participants and two additional people. No further products or interaction among participants.		

.

2. "How does nature speak?," Pori, Finland, 22-24 May 2000

Innovative features: Clear product, but indirect route taken to promote it, involving extensive individual reflection and exploration of connections through writing and small group discussions.

Organizer: Yrjö Haila, Professor of Regional and Environmental Studies, University of Tampere

Facilitator: Peter Taylor, Acting Director, Critical & Creative Thinking Program, University of Massachusetts, Boston

Program

	Morning	Afternoon	Evening
pre-workshop	Workshops with international guests each August since 1996. Sub-project: Finnish anthology of new essays by Finnish participants; target--spring '01 May Days (presentations by Environmental Social Science Doctoral students from Finland & two international guests) immediately preceding Pori workshop		
Day 1	Day 1 F: Process Themes to chew on concerning our interactions and process as a group. O: How does nature speak? Themes & Topics G(F): Freewriting -> Go around on "What the project looks like to me."	G (F): Continue to elaborate on "what the project looks like to me" G (F): Connections--where the projects of others connect with yours. G (F): "Focused conversation" review (Stanfield 1997)	Homework (F): Read and prepare idea regarding a shared case: Developing a local climate change policy for Tampere
Day 2	G (O): Freewrite: "I know what I can do to help move from individual view to common project" G: Concept maps of each person's project.	G: Discussion of shared case study on Tampere local climate change policy. G: Freewrite: "What is stabilizable & needs more playing with" -> shared reflection.	-
Day 3	O: Book back on the agenda G (O/F): Freewrite on tension b/w individual pieces & book as common project G (F): Report on the case for your essay. G (F): Compose 5 statements you are taking away -> Go around G: Appreciations	Lunch before departures.	-
Post-workshop	Products not known to the author.		

3. "Developing an NSF Research Agenda for Linking Biogeophysical and Socio-economic Systems," Tempe, 5-8 June 2000

Organizer/Facilitator Ann Kinzig, Biology, Arizona State University, with steering committee of 8 others

Innovative features Extensive use of active working groups, with evolution from challenges to criteria to research areas. Apparent openness to unprogrammed suggestions.

Program

	Morning	**Afternoon**	**Evening**
pre-workshop	Precirculated O's proposal plus white papers		
Day 1	G: Introductions & brainstorming about challenges requiring interdisciplinary research.	Pre-assigned Working Groups (WGs) on criteria to select challenges & research areas G: Reports from WGs.	Social
Day 2	WGs on challenges & research areas	New pre-assigned WGs: mapping research areas to challenges.	Social
Day 3	WGs mapping research areas to challenges + overlooked areas.	G: WG reports O: Presented Outline	Social
Day 4	G: WG reports G: Discussion of Areas covered in WGs but not in outline; Other overlooked areas; Title; Reaching a broader audience; Writing.	G: discussion (cont.)	-
post-workshop	Report "Nature and Society: An imperative for Integrated Environmental Research" produced by Kinzig (O) following her outline (see day 3), with greater and lesser input from steering committee. Released November.		

4. "Helping Each Other to Foster Critical Thinking about Biology and Society," Cambridge, 29-31 July 2000

Organizer/Facilitator Peter Taylor, Acting Director, Critical & Creative Thinking Program, University of Massachusetts, Boston

Innovative features Exploration of ways that placing developments in science and technology in their social context could enliven and enrich science education, science popularization, and citizen activism. Guiding principle was that participants benefit more when professional development opportunities allow them to connect theoretical, pedagogical, practical, political, and personal aspects of the issue at hand.

Program

	Morning	Afternoon	Evening
pre-workshop	Participants invited to submit proposals for experiential sessions, in which "instead of telling us what you have thought or found out, you will lead other participants to experience the issues and directions you are exploring."		
Day 1	-	-	G: Brief introductions Longer spoken autobiographies, centered around how each participant connected with the focus of this workshop. Freewriting: "What the 'Helping Each Other to Foster Critical Thinking' endeavor looks like to me"-> Go around
Day 2	Autobiographies continued.	Two participant-led sessions	Third (abbreviated) participant-led session
Day 3	G: Freewriting: "What is stabilizable and what needs more playing with"-> Go around Sub-groups: Remaining participants presented on their concerns. Focused conversation review of experience	_	_
post-workshop	One participant initiated a project with two others to monitor the curriculum development each is undertaking with a view to increasing representation of women and their perspectives in biology.		

Review of workshops from the six angles

	Santa Barbara	Pori, Finland	Arizona	Cambridge
> 1 person's knowledge and research skills needed	Y	Y	Y	Too small & short
> 1 party involved in environmental issue	~	~ (soc. sci. researchers only)	~ (unrepresentative of researchers or others)	Too small & short
Conduct ongoing assessment that environmental complexity necessitates	-	-	-	-
create knowledge > sum of participants' > any single participant's	~	Y	~	Y
ensure investment in the product of the collaboration	X	Y	X (except $$ for researchers)	~
create capacity for productive engagement in multi-party collaborations	X	Y	?	Y (incrementally?)

Open Questions

The West Nipissing plan, described at the start of the paper, built from straightforward knowledge that the varied participants had been able to express through the facilitated participatory process. Unlike the Kerang study, detailed scientific or social scientific analysis was not needed. Moreover, the process was repeated, which presumably allowed the participating community members to factor in changes and contingencies, such as the decline in the exchange rate with the USA. And, most importantly, the process has led the participants to become invested in carrying out their plans and to participate beyond the ICA-facilitated planning process in shaping their own future.

Some difficult questions for me were opened up by this contrast, given that my own environmental research has drawn primarily on my skills in quantitative methods. What role remained for researchers to insert the "translocal" into participatory planning, that is, their analysis of changes that arise beyond the local region or at a larger scale than the local? For example, if I had moved to the Kerang region and participated directly in shaping its future, I would still have known about the government ministry's policy-making efforts, the data and models used in the economic analysis, and so on. Indeed, the "local" for professional knowledge-makers cannot be as place-based or fixed as it would be for most community members (Harvey 1995). What would it mean, then, to take seriously the creativity and capacity-building that seems to follow from well-facilitated participation but not to conclude that researchers should "go local" and focus all their efforts on one place? In other words, the challenge is to make creative or generative the tension between local and trans-local knowledge in OMPCPs.

When I first presented the West Nipissing-Kerang contrast, I asked the audience to explore this question through some guided freewriting. My own freewriting on that occasion produced a new term, "flexible engagement." This seemed to capture the challenge for researchers in any knowledge-making situation of connecting quickly with others who are almost ready to foster-formally or otherwise-participatory processes and, through the experience such processes provide their participants, to enhance the capacity of others to do likewise. The term plays off the "flexible specialization" that arose during the 1980s, wherein transnational corporations directed production and investment quickly to the most profitable areas, discounting previous commitments to full-time employees and their localities. Would flexible engagement constitute resistance or accommodation to flexible specialization?-this remains an open question.

This line of questioning above and angles 4-6 from the review of the four workshops led me to dig deeper into how workshops work when they do. I assembled a list of heuristics that I include in a suggestive "appendix." A member of the audience for my first presentation of this paper, Tom Flanagan, offered to help me develop a more systematic set of principles for bringing about successful workshops. The process he led me through involved:

a. Defining my criteria for a successful workshop;

b. Rephrasing the heuristics as conditions that might contribute directly or indirectly to these criteria being fulfilled;

c. Answering a set of questions of the form: "Would addressing condition A significantly help in achieving condition B?"

These questions were generated by software [4] that analyzed my responses and then arranged the conditions from "deep" to "top," where deeper conditions are helpful for the ones above them. This constitutes the structural model.

Tom's intention was only to introduce me to the concept, not to lead me systematically through the full process so I do not want to over-interpret the outcome. I include in the appendix only the deepest three layers and the top of the model to help readers picture a structural model. Let me simply draw attention to the deepest condition, "quiet spaces that occur are not filled up." It is no small challenge for someone organizing or facilitating a workshop or OMPCP to ensure that this condition is met. Conversely, if it is not met, it should not be surprising that the criteria for a successful workshop are not achieved. In the same spirit, given that I am interested in stimulating further inquiry about OMPCPs and, more generally, about the relationship between knowledge and inquiry—product and process—I will say no more at this point.

Appendix: Conditions for a Successful workshop

a. Criteria of success

i) the outcome is larger and more durable than what any one participant came in with. Durable means

a) the participants are engaged in carrying out or carrying on the knowledge and plans they develop; and

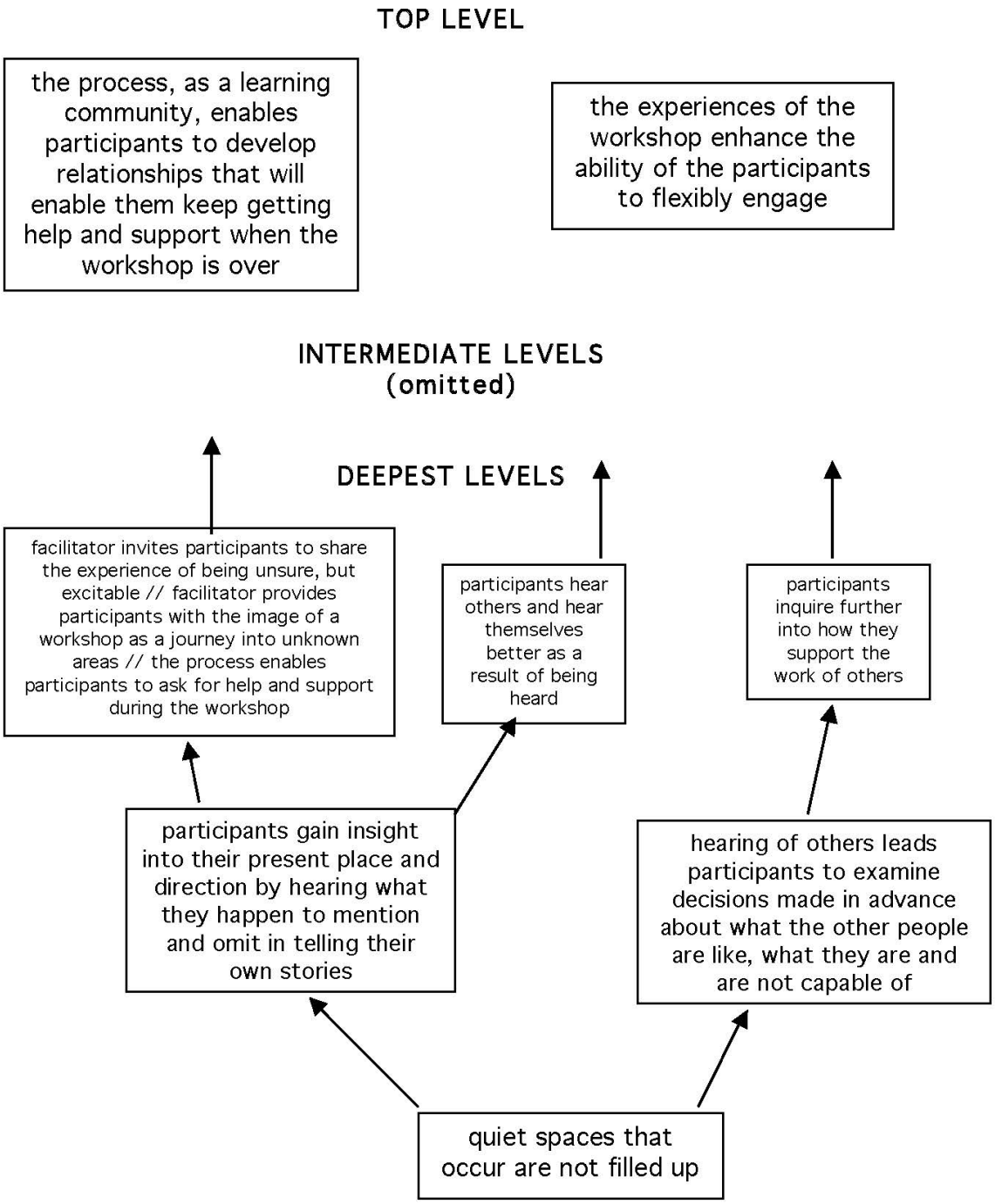
b) the knowledge is applied and has significance; and

ii) participants' subsequent work enhances the capacity of others to flexibly engage, that is, to connect with people who are able to take initiative-or are almost able to-in forming communities of practice/change collaborations that provide their participants experiences that enhance their ability to flexibly engage.

b. Conditions that might contribute directly or indirectly to these criteria being fulfilled

- it brings to the surface knowledge of the participants that they were not able, at first, to acknowledge.
- participants get to know more about each others' not-yet-stable aspects.
- quiet spaces that occur are not filled up.
- participants recognize that there is insight in every response.
- the facilitator invites participants to share the experience of being unsure, but excitable.

- the facilitator provides participants with the image of a workshop as a journey into unknown areas or allowing them to see familiar areas in a fresh light. (A workshop/journey involves risk; requires support; creates more experiences than can be integrated at first sight; yields personal changes.)
- participants gain insight into their present place and direction by hearing what they happen to mention and omit in telling their own stories.
- participants are heard.
- participants hear others and hear themselves better as a result of being heard.
- this hearing of others leads participants to examine decisions made in advance about what the other people are like, what they are and are not capable of.
- participants inquire further on the issues that arise in their own projects.
- participants inquire further into how they support the work of others.
- participants' energies are mobilized by the process.
- there is a wide range of participants, not only technically expert participants.
- the plans allow for individual participants to select and focus on a subset of the workshop-generated specific plans or knowlege in their subsequent work.
- the process, as a learning community, enables participants to ask for help and support during the workshop.
- the process, as a learning community, enables participants to develop relationships that will enable them keep getting help and support when the workshop is over.
- participants find opportunities to affirm what is working well.
- the reflection on each phase leads to one concrete product to take into next phase.
- the experiences of the workshop enhance the ability of the participants to flexibly engage.


TOP LEVEL
the process, as a learning community, enables participants to develop relationships that will enable them keep getting help and support when the workshop is over
the experiences of the workshop enhance the ability of the participants to flexibly engage
INTERMEDIATE LEVELS
(omitted)
DEEPEST LEVELS
facilitator invites participants to share the experience of being unsure, but excitable // facilitator provides participants with the image of a workshop as a journey into unknown areas // the process enables participants to ask for help and support during the workshop
participants hear others and hear themselves better as a result of being heard
participants inquire further into how they support the work of others
participants gain insight into their present place and direction by hearing what they happen to mention and omit in telling their own stories
hearing of others leads participants to examine decisions made in advance about what the other people are like, what they are and are not capable of
quiet spaces that occur are not filled up

Acknowledgements

In preparing and revising this essay, I drew upon information provided by the organizers of the four workshops and Duncan Holmes, the ICA facilitator of the West Nipissing community planning process, and on the comments of participants of the ECOS seminar at University of Massachusetts, Boston. One of the workshop was conducted at the National Center for Ecological Synthesis and Research, a center funded by NSF (Grant #DEB-94-21535), The University of California at Santa Barbara, and the State of California, and another was conducted at Arizona State University also funded by NSF (Grants #DEB-9910620 and 0073653). Tom Flanagan introduced me to structural modeling using Cogni Systems software, but is in no way responsible for my cursory account of this methodology.

References

Burbidge, J. (Ed.) (1997). Beyond Prince and Merchant: Citizen Participation and the Rise of Civil Society. New York: Pact Publications.

Ebata, T. (1997). "Adaptive Management References." www.for.gov.bc.ca/hfp/amhome/annobib/ambib.htm (viewed June 14, 2000).

Elbow, P. (1981). Writing with Power. New York: Oxford University Press.

Gunderson, L. H., C. S. Holling and S. S. Light (Eds.) (1995). Barriers and Bridges to the Renewal of Ecosystems and Institutions. New York: Columbia University Press.

Harvey, D. (1995). "Militant particularism and global ambition: The conceptual politics of place, space, and environment in the work of Raymond Williams." Social Text 42: 69-98.

Holling, C. S. (1978). Adaptive Environmental Assessment and Management. London: John Wiley.

Spencer, L. J. (1989). Winning Through Participation. Dubuque, Iowa: Kendall/Hunt.

Stanfield, B. (Ed.) (1997). The Art of Focused Conversation. Toronto: Canadian Institute of Cultural Affairs.

Taylor, P. J. (1995). "Building on construction: An exploration of heterogeneous constructionism, using an analogy from psychology and a sketch from socio-economic modeling." Perspectives on Science 3(1): 66-98.

Walters, C. (1986). Adaptive Management of Renewable Resources. New York: MacMillan.

West Nipissing Economic Development Corporation (1993). "Vision 20/20: Shaping our futures together, Executive Sumary." (April 1993).

West Nipissing Economic Development Corporation (1999). "Vision 2000 Plus, Executive Summary." (June 1999).

Notes

[1] Exhibits of the workshop process

are assembled or linked at http://www.faculty.umb.edu/pjt/ECOSextras.html. These include:

From Workshop on "Rethinking the "and" in "Humans and Nature": Ecology at the Boundary of Human Systems"

- American Science Federation proposal
- Thought-piece by Peter Taylor, circulated by email
- Commentary in Denver Post
- Symposium at Ecological Society of America, August 2000
- See also G. Bradshaw and M. Bekoff, "Integrating humans and nature: reconciling the boundaries of science and society," Trends in Ecology & Evolution, 15(8): 309-310

From "How does nature speak?"

- Notes from program/process
- Departing statements/ themes/ questions

From NSF workshop on "Developing a Research Agenda for Linking Biogeophysical and Socio-economic Systems"

- Thought-piece by Peter Taylor, submitted to Organizer
- Executive Summary and Full Report

From "Helping Each Other to Foster Critical Thinking about Biology and Society"

- Report

Responses after Freewriting Exercise, conducted when delivering this paper, 15 Nov. 2001

[2] Basic propositions of the ICA workshop process, plus some supplements

(adapted from ICA material by the author)

- Notwithstanding any initial impressions to the contrary, everyone has insight (wisdom) and we need everyone's insight for the wisest result.
- There is insight in every response. (There are no wrong answers.)
- We know more than we are, at first, prepared or able to acknowledge.
- When a person is heard, they can better hear others and hear themselves. This causes us to examine decisions made in advance about what the other people are like, what they are and are not capable of.
- The step-by-step workshop process thus aims to keep us listening actively to each other, foster mutual respect, and elicit more of our insight.
- Your initial conclusions may change -- be open for surprises.
- What we come out with is very likely to be larger and more durable than what any one person came in with; the more so, the more voices that are brought out by the process.

- In particular, we will be engaged in carrying out/carrying on the plans we develop.
- In sum, the workshop process aims for the "greatest input, with greatest commitment and the least confusion, in the least time."
- The basic structure of ICA workshop processes is to move through four phases -- objective, reflective, interpretive, decisional. This is best represented in a "focused conversation" (Spencer 1989, Stanfield 1997).

[3] Adaptive Environmental Assessment and Management (AEAM)

assumes that the dynamics of any ecological situation are not fully captured by any model or composite of models, especially because management practices produce continuing changes in those dynamics, which makes the ecological situation a moving target. AEAM turns that limitation into an opportunity, attempting to bridge gaps in knowledge through carefully designed experiments in environmental management. In these policy experiments a range of management practices, chosen on the basis of existing knowledge and model-based predictions, are implemented and lessons are drawn from the different outcomes (Holling 1978, Walters 1986, Gunderson et al. 1995, Ebata 1997).

[4] Cogni System software

is part of a suite of services in collaborative design from CWA Ltd. (www.cwaltd.com). Kevin M.C. Dye (KMCDye@aol.com) is the CWA associate with whom Tom Flanagan collaborates.