

Environmental Education, Wicked Problems, and Virtue

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INTRODUCTION

Academics and policymakers continue to look to the promise of participatory approaches for addressing environmental problems. Approaches range from deliberative risk assessment methods to community-based participatory research to citizen cells and consensus conferences.¹ Though increasing and improving participation is popular today, even the most promising ideas face difficulties often owing to the intractability, or *wickedness*, of many environmental problems. A problem can be described as wicked when it involves deep disagreement and distrust among policymakers and stakeholders (even over how to formulate the problem itself), high degrees of scientific uncertainty, and a lack of any set of solutions that will not be harmful or disadvantageous to someone in some relevant way.² In the contexts of wicked problems, participatory approaches may not have any traction with government officials and policymakers and serve to amplify disagreements among participants.

Many scholars and environmental professionals are trying to figure out ways of structuring participation processes to facilitate collective learning among participants embroiled in a wicked problem.³ These structures could improve the quality and legitimacy of the outcomes of participatory processes because participants are encouraged to interact with one another in ways that facilitate trust and appreciation of others' perspectives. Trust and appreciation can, in turn, help participants to avoid social biases and strike better compromises than would be possible in the sort of adversarial or tightly controlled settings found in many longstanding practices like public hearings. Participatory processes could be transformed into systems of interactions that lead to the creation of more reasonable environmental policy options, which could also change how policymakers and government officials participate in them and interpret and act on the outcomes.

But even well structured activities based on collective learning processes can fail if actors possess traits that impede deliberation. Therefore, we focus on the promise of education for the sorts of skills and virtues peculiar to dealing with wicked problems through participatory processes. What is the role of education for skills and virtues relative to other aspects of environmental education, such as facts and values education? How important is it relative to the careful design of the deliberations? What virtues really matter?⁴

WICKED PROBLEMS AND PARTICIPATION

Participatory approaches are particularly needed to address the wickedness of many environmental problems. The aspects of wicked problems outlined by Horst Rittel and Melvin Webber in 1973 are that there are no (1) definitive problem formulations shared by all parties, (2) stopping rules, (3) true or false solutions (only good or bad; better or worse), (4) immediate or ultimate tests of proposed solutions,

(5) insignificant opportunities to learn by trial-and-error, and (6) sets of potential solutions or well-described sets of permissible operations that may be incorporated into the plan. Additionally, (7) every wicked problem is essentially unique, (8) can be considered to be a symptom of another problem, and (9) admits of discrepancies that can be explained in numerous ways. Finally, (10) the planner has no right to be wrong.⁵ These aspects are present in environmental problems such as climate change, natural resource management, and sustainability.⁶

Preparing ourselves and future citizens to cope with the wickedness of environmental problems requires some changes in the ways we think of problem solving. This is where participation becomes important. One of the changes we focus on here is that it is unlikely that experts and policymakers alone will adequately handle wicked problems. Experts do not occupy disinterested grounds from which they can give unbiased advice, nor can any stakeholder's formulation of the problem be characterized as *prima facie* privileged over that of another.⁷ Most stakeholders have particular epistemic insights over certain aspects of the problem, from science credentials to local experience. These considerations suggest the need for engaging the different stakeholders on terms that will help them learn from and trust one another.

Over the last twenty years theoretical research has increased on how to structure participation activities to facilitate successful interaction among diverse participants like policymakers, experts, and stakeholders.⁸ By "structure" we mean the organizational and facilitation methods of actual events, and the connection between participation and policymaking. One approach that is gaining momentum structures participation processes so as to facilitate collective learning.

In response to wicked problems, Valerie Brown describes one version of this approach that stems from David Kolb.⁹ The latter emphasizes the need to create a structured process in which a diverse group of learners reflect on concrete experiences that are at the root of the problem, form abstract concepts derived from their reflections, test the concepts before using them to guide actions, and repeat the learning cycle. The Kolb Learning Cycle is rather different from expert driven approaches since it facilitates active, collaborative, and repeated learning by everyone in a group of people with different backgrounds. We can imagine this structure being used for engaging stakeholders and the public on a state-level climate change or wildlife policy, or even as a substitute for the more typical public meeting and hearing formats used in permitting processes.

Applications of the Kolb Learning Cycle to participatory approaches will certainly improve with experience. However, we argue that one of the important conditions for ensuring that learning processes go well is that the participants possess adequate skills and virtues. As the basis for this worry, consider some cases in the literature on participatory learning processes. The first is a study of a consensus conference on the risks of nanotechnology. In it, the participants showed little motivation to do the hard work of learning about nanotechnology and organizing outreach events. Processes cannot be very successful if citizens are not motivated to learn about relevant issues on their own. The second case involves

aboriginal environmental professionals and elders in a conference on the environmental health of the Great Lakes. In a set of interviews, these participants appreciated the process, but felt their inputs were not respected by non-Natives because the latter were defensive and territorial, which are both common deliberative vices.¹⁰ In deliberative processes involving multiple social groups, participants must in any case be prepared to work amicably with those who are unfamiliar. The non-Native participants seem to have lacked what Scott Aikin and Caleb Clanton have called “group-deliberative virtues,” including deliberative friendliness and humility.¹¹ The absence of these virtues can cause deliberative processes to fail even when all stakeholders are actively participating.

The philosophical literature on environmental education places no emphasis on deliberative virtues. Philosophers tend to focus exclusively on the values to which students should be exposed as if adequate policies for every new situation are simply deductions from pre-given values. This tendency is shared by philosophers who see the importance of character development.¹² The emphasis on teaching values could possibly result from philosophers’ ignoring the wicked dimensions of environmental problems.

But a single-minded preoccupation with values would make for an incomplete environmental education. Though some traditional virtues do not obviously require environmental sensitivity, some might, such as humility and gratitude.¹³ And while familiarity with environmental values may affect a student’s future character and conduct, knowledge of values is one thing and the skills and habits of acting on them is another. Which virtues go with which values moreover is not obvious. Finally, if many environmental problems are wicked problems, values instruction is also liable to be only so useful to the student. Managing these problems well will not be a simple matter of weighing the various commensurable values in play, but of judgment, practical wisdom, negotiation, or compromise.

PARTICIPATORY VIRTUE

If addressing environmental problems well requires judgment, practical wisdom, negotiation, and compromise, it will require considerable virtue. The nanotechnology and Great Lakes conference cases point toward the virtues belonging to participants of successful participatory processes (call them *participatory virtues*), namely virtues enabling inclusiveness and engagement with the harder things. In the service of inclusiveness, this suggests that virtues of reasonableness and fairness, empathy, temperance, and humility are important. On the other hand, the importance of engagement suggests a need for virtues like basic self-confidence, dependability, generosity, and patience and resilience. But the precise importance of such virtues, how exactly they should be characterized, and whether other virtues also matter, depends really on the goals and nature of participatory processes. Provided they are plausibly regarded as virtues of persons generally, the most important participatory virtues are those best enabling achievement of those goals.

According to Thomas Dietz and Paul Stern, participatory events of all kinds generally tend to serve three aims: (1) enhancing the quality of assessments or

decisions, (2) securing the legitimacy of processes or decisions, and (3) enhancing the deliberative capacities of participants.¹⁴ This list of aims is widely accepted, though others may formulate the aims differently or argue that some one of them (for example, the first) is more fundamental than the others. Some of these differences may make a difference to the account of participatory virtue one develops.

In their discussion of group-deliberative virtue, Aikin and Clanton, for instance, maintain that because group-deliberative processes characteristically achieve goals such as problem solving and the resolution of disagreement through the exchange and production of knowledge, “good epistemic outcomes” is their “ultimate objective.” Consequently they argue that the central virtues of deliberative groups are those that, in one or the other of two ways, enable synergy between members of the group in the production of knowledge. In the first way, virtuous traits enable group synergy by improving the epistemic evaluation of whatever issue is at hand. In the second way, “they contribute to the deliberations, either by arguments *or by other non-argumentative means*, to the continued synergistic functioning of the group.”¹⁵ They end up with a list of virtues including deliberative wit, friendliness, temperance, courage, sincerity, and humility.

This list of virtues to some extent aligns with those that, in light of the nanotechnology and Great Lakes cases, we suspect will facilitate inclusiveness and engagement in participatory groups. Perhaps Native participants to the Great Lakes conference would not have felt disrespected if non-Native participants had exercised greater deliberative humility or friendliness. However, the central importance Aikin and Clanton place on the production of knowledge leads them both to include different virtues, such as wit and sincerity, and to characterize them largely in terms of cognitive habits. They characterize deliberative humility, for instance, as “the willingness to hold one’s own view fallibly and in such a way as to admit that one might be shown to be wrong in light of better reasons, evidence, and argument.”¹⁶

The suggestion that knowledge is a very important goal of participation certainly resonates with other observations and theories about what makes participatory approaches succeed. When participants disagree at a particularly deep level, for instance, deliberative deadlock is liable to occur when participants’ preconceived views of what is right go unchallenged. This is illustrated in numerous environmental conflicts where peoples’ views about a particular action, like whether water should be diverted from a river, undermine their ability to compromise with each other and explore solutions that work in some way for all parties. On the other hand, the production of new knowledge through deliberation can reveal a previously invisible resolution that is acceptable to both. Group deliberations that proceed in a spirit of collaborative critical dialogue are more likely to succeed than those that do not.

Nevertheless, to say that something is the ultimate aim of a process is to make a particularly strong claim on its behalf. Everything else is of secondary importance and subserves this aim. We do not believe that the production of new knowledge relates in quite this way to participatory approaches to environmental assessment or

decision making. In the context of wicked problems, the ultimate aim of participatory processes can be some combination of quality decision making, legitimacy, and so on. The suggestion that such approaches ultimately aim to produce knowledge is also perhaps in tension with the frequently wicked nature of environmental problems. While new knowledge certainly can be produced in the course of confronting wicked problems, knowledge of a uniquely right or wrong answer about them is likely not forthcoming.

So while we are suspicious of the view that knowledge is the ultimate aim of participatory processes generally, we believe that participatory virtue will require virtues of epistemic productivity in addition to virtues of inclusiveness and engagement. These include the more cognitive virtues enumerated by Aikin and Clanton such as sincerity and wit, but could probably be extended to include others, such as attentiveness and reasonableness, which either accompany or even underlie these others. In light of case studies like those above, however, we suggest that the non-epistemic virtues critical to group synergy include specifically virtues of inclusiveness and engagement. Many of the virtues Aikin and Clanton enumerate, such as friendliness and humility, will serve these ends, inclusiveness especially. But again, their list could be refined to include other, more fundamental traits such as basic self-confidence, and virtues that are apparently important for engaging the more challenging aspects of participation, such as dependability, resilience, and generosity, which are altogether missing from their treatment. Because such virtues are so critical to getting and *keeping* people merely involved in participation, they enable deliberative groups to harness the epistemic advantages inherent in participatory approaches. Keeping people in participation may also help to build trust, an issue that we cannot explore in detail here. These virtues, then, are perhaps more important generally to successful participation than the more cognitive virtues Aikin and Clanton emphasize.

Consider, for instance, *basic self-confidence*. This is an abiding general security in the experience and expression of one's needs, feelings, or beliefs, as well as in one's ability to complete difficult or new tasks through one's own efforts or by finding appropriate help. Persons having it should be contrasted, on the one hand, to arrogant persons, who never see any reasons for self-doubt, and, on the other, to overly self-critical persons. In participatory contexts, the basically self-confident person is less likely to shrink in fear or self-doubt from the process when confronted by new and complicated information, such as that found in a scholarly journal article. But they are also more likely to exhibit courage in deliberatively important circumstances, such as when dealing with perceived authorities (scientists or government actors, for instance). Yet this courage is also less likely to spill over into deliberative *hubris*, a trait incompatible with deliberative humility, insofar as the basically self-confident person's sense of self-worth does not hang on winning or losing an argument. Basic self-confidence is thus important both because of the role it plays in the motivation to engage difficult tasks and as a psychological prerequisite of deliberative courage and humility.

We conclude that a number of qualities not on Aikin and Clanton's list seem to be important participatory virtues, including basic self-confidence, attentiveness, dependability, reasonableness and fairness, generosity, and patience and resilience. Altogether, participatory virtue seems to be comprised of at least the qualities listed in the table below. Space forbids including a full description of these virtues here. But the first seven virtues on the list are those enumerated by Aikin and Clanton. The remainder consists of those we suggest should be added. Probably more could be added and more work needs to be done to clarify the relationship between those on the list. But if our account of the aims of participatory approaches to decision making is accurate, this list should be reasonably accurate. Those aims are diverse and include not just the production of knowledge, but also things like consensus building and enhancing the deliberative capacities of citizens. Virtues of inclusiveness and engagement are especially important to achieving those aims. Our list reflects that by including virtues that have them as their primary aim or target (this is what the check marks indicate). But the idea that virtues have a target is a loose one. A virtue can be good for many different things and some virtues seem to have more than one primary aim. Indeed, in ideal deliberative contexts, the participatory virtues work together to generate an atmosphere of collaborative critical dialogue through which the deliberative capacities of citizens are recruited to produce legitimate, high quality environmental decisions. Along the way, the deliberative capacities of citizens will hopefully be sharpened, too.

Table Qualities Comprising Participatory Virtue

Virtue	Inclusiveness	Engagement	Epistemic productivity
1. Wit			✓
2. Friendliness	✓		
3. Empathy, charity	✓		✓
4. Courage		✓	
5. Temperance	✓		
6. Sincerity			✓
7. Humility	✓		✓
8. Basic self-confidence		✓	
9. Resilience, persistence		✓	
10. Attentiveness		✓	✓
11. Dependability		✓	
12. Reasonableness, fairness	✓		
13. Generosity	✓	✓	
14. Patience	✓	✓	

EDUCATION FOR PARTICIPATORY VIRTUE

Irrespective of the educative powers inherent in participatory events, it is unlikely that future citizens will acquire the participatory virtues to any very high degree without the support of formal education. While some of the learning participatory virtue requires may take place in family life and through other interactions with fellow citizens, participatory events may call upon the virtues in very different ways from those in which interactions with familial members or other citizens' interactions do. Neither the sense of shared mission common to families nor the polite distance of agreeing to disagree, common to other sorts of citizen discussions, can be assumed in participatory events devoted to collective decision making.

How schools can educate children in particular for participatory virtues will depend on several factors, including how the virtues are theorized and how moral development and learning occur. We have mentioned already the Kolb Learning Cycle and how it may be applied to tackling wicked problems through participatory events. Generally we endorse learning models in which knowledge is not merely received passively, but reconstructed in the learner through experience, active engagement with the subject matter, and dialogic inquiry with others. From this point of view, we propose that active student involvement in participatory decision making within schools might be one crucial aspect of how they can support the participatory virtues. How or to what extent schools would need to be reformed to achieve this aim is beyond the scope of the current discussion and the efficacy of this approach, and of different versions of it, merit further study. But possible ways in which schools can support participatory virtues can be more or less ambitious, ranging from classroom exercises in participatory decision making to the devolvement of authority for some school policy choices to appropriately guided deliberative student bodies.¹⁷

The reorganization of schools or classrooms into student deliberative communities cannot, however, be a sufficient basis for learning participatory virtues. As we have argued already, even the best well structured participatory events can fail when participants do not bring the virtues to bear in their deliberations. In order for children to acquire the participatory virtues through practice in participatory decision making, they have to be exposed to the virtues, mechanisms for reinforcing their exercise and discouraging the exercise of vices must be implemented, and they must have opportunities to discuss why certain traits are virtues and others vices and what is good and bad, right and wrong, from a moral point of view and why. Here the behavior and methods of teachers and administrators matters. In their own interactions with students and with one another, teachers and administrators should strive to exercise participatory virtues themselves. They should also achieve a fairly high degree of competency in conceptualizing the virtues and be prepared to talk competently about the conditions for their exercise. Without these competencies, teachers may be unable to identify which virtues a child's behavior manifests a lack of or to know how best to respond in particular situations. They may also be unable to lead discussions of ethical issues in ways that advance students' capacities for reasoning about moral problems.

Education for participatory virtue is also complicated by the fact that participatory virtues are a mixed bag. Some, such as those emphasized by Aikin and Clanton, are more intellectual while others are more plainly practical. Some, like reasonableness, have both significant intellectual and practical dimensions. Participatory virtue education will thus need to combine elements from theories of moral education traditionally seen as at odds, such as Kantian rationalist theories and Aristotelian character theories.¹⁸ From the rationalist tradition, equipping children with the ability to think critically about moral problems should be an important aim of participatory virtue education. In the service of this aim, approaches such as Lawrence Kohlberg's moral dilemmas approach and even Values Clarification might play important roles. But since virtues are complex dispositions involving emotions and motives alongside reason, participatory virtue education can occur through mechanisms that are not related to cognitive abilities, or even directly to participatory virtue. As argued above, basic self-confidence, for instance, is an important psychological component of deliberative humility. But schools can support this by restructuring school programs in ways that combat children's tendencies to form exclusive social groups by creating a wider diversity of extra-curricular social forums, more evenly distributing resources and hoopla between them, or making some participation in less popular activities, such as music or art, mandatory.¹⁹

Altogether, participatory virtue education must consist of a number of elements. Schools must create opportunities for students to participate in collective decision making. Educators must model the virtues and reinforce their exercise in students through appropriate rewards and punishments. Children must have opportunities to discuss moral problems and to learn about alternative points of view and how to reason about them. And school social environments must themselves be structured in ways that support the psychological prerequisites of the virtues.

In the context of wicked problems, participation processes that are well structured can fail if participants possess traits that impede deliberation. Previous lists of virtues for deliberations should be refined to include others that are critical to getting and keeping people merely involved in participation and enabling deliberative groups to harness the epistemic advantages inherent in participatory approaches. Consequently environmental educators should endeavor to cultivate these virtues when preparing students to participate as good citizens in public processes for environmental decision making and assessment.

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