

# **Environmental Health Education: A Participatory Holistic Approach**

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## **Référence:**

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## **Abstract**

In response to the lack of theoretical foundations in the emerging field of “environmental health education”, this article presents a proposal for a theoretical framework which integrates complementary elements drawn mainly from the fields of environmental education, health education, and risk education. This framework is centred on a participatory holistic approach; it seeks to stimulate the development of personal and collective competencies for citizen involvement in improving the relationship between communities and their environment in order to simultaneously promote human health and the integrity of the closely interrelated life systems. The development of this proposal is based on an initial theoretical construct, produced from an anasynthesis of existing literature and results of previous projects, that is being validated and enriched by actual empirical fieldwork. The latter involves the collaborative design and experimentation of educational-intervention projects, among social groups in the region of Lac Saint-Pierre, concerning the issue of fish consumption, its benefit, and also the risks associated to lake chemical contamination.

## **Résumé**

En raison de la gravité et de l'accélération croissante des questions sociales et environnementales qui l'interpellent, il importe de stimuler le développement du domaine de recherche spécifique et encore émergent de l'«éducation relative à la santé environnementale». Certes, on peut retracer des programmes d'action, des guides ou des projets d'intervention fort pertinents dans le domaine de la santé environnementale, mais on constate le plus souvent que la dimension éducative reste peu développée et que les fondements théoriques de cette dernière ne sont pas suffisamment explicités; on retrouve par ailleurs peu de rapports de recherche formelle de type empirique ou appliqué dans ce domaine spécifique. Dans le cadre d'un projet de recherche-intervention participative axé sur la problématique des contaminants au Lac Saint-Pierre, nous menons des travaux visant à contribuer au développement théorique et stratégique de ce domaine, en proposant une intégration inédite d'éléments formels, axiologiques et praxéologiques issus des champs de l'éducation relative à l'environnement, de l'éducation à la santé et de l'éducation aux risques. Une première construction théorique par anasynthèse est rétroactivement validée et enrichie par le volet empirique de cette recherche, impliquant la conception et l'expérimentation collaborative de projets d'intervention éducative auprès de divers groupes sociaux de la région. La proposition de définition et de caractérisation que nous développons pour l'éducation relative à la santé environnementale adopte une approche holistique et participative; elle vise à stimuler le développement de compétences personnelles et collectives relatives à la participation citoyenne à l'amélioration du réseau des relations entre les populations et leurs écosystèmes de référence.

## Introduction

Given the importance of social and environmental issues at stake, there is clearly a need to develop research and practice in the distinctive, still-emergent field of “environmental health education”. Significant environmental health action agendas, guidelines, and projects are being reported often in the context of government programs or of nongovernmental-organization initiatives (for example, Nicholson et al., 2002; Canadian Urban Institute, 2003; Mason, 2003). However, the implicit or potential educational dimension of these proposals is not yet fully laid out. Except in works by a small number of authors (such as Gregory, 1991 and Jensen et al., 2001), theoretical foundations for environmental health education are rarely made explicit and seldom discussed, and there are very few published reports of formal empirical or applied research in this specific area.

This article provides a broad presentation of the key elements of a theoretical framework for environmental health education that stems from our effort to weave together complementary components of an integrated model as a basis for discussion and further improvement. A first version of this theoretical proposal has been constructed through a process of anasynthesis<sup>1</sup> (Legendre, 1983, pp 206-212) of already existing elements found in environmental education, health education, and risk education literature, including reflections emerging from our own previous educational experience. We also undertook a collaborative research-development process to design and experiment appropriate educational strategies for the particular context of Lac Saint-Pierre (Québec) on the issue of water and fish contamination. This intervention process has, in turn, helped validate and enrich the initial theoretical proposal. Our project thus combines research and practice as two closely interrelated dimensions that illuminate and enrich each other through continuous feedback (Van der Maren, 1999).

Lac Saint-Pierre is one of the case studies within the interdisciplinary COMERN research project<sup>2</sup> on the risk to human health associated with mercury contamination of aquatic ecosystems. Our specific environmental education work seeks to stimulate communities participation in the investigation and education interrelated processes so as to collectively clarify the sociocultural components of the global issue, to search for appropriate solutions, and raise motivation and skills for involvement in health-related environmental projects. It also responds to one of the main objectives of COMERN: provide assistance to political and community-level decision makers in addressing the problem of mercury contamination. Lac Saint-Pierre is a fluvial lake in the Saint Lawrence River, presenting interesting ecological features for the study of the mercury cycle and a strong “culture” of hunting and fishing as part of the social regional “landscape”. Associating our fieldwork experience in this context with our ongoing theoretical

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<sup>1</sup> The anasynthesis process, which is aimed at developing a theoretical model, is made up of six phases that feed back on each other: diagnosis of the initial situation (the need for such a model, general specifications); analysis of existing “parts” of the desired model drawn from the literature and practice; coherent synthesis of relevant “parts”; creative construction of a first “prototype” of the model; theoretical or experimental validations; and production of an “optimal” model that acknowledges the limitations inherent in the process.

<sup>2</sup> Collaborative Mercury Network: <http://www.unites.uqam.ca/comern/>

construction process brought us to reflect on epistemological, ethical, strategic, and pedagogical issues related to environmental health education<sup>3</sup>.

### **Complex and Coherent Construct**

Our proposal integrates elements derived mainly from an analysis of three educational fields: environmental education, health education and risk education. Clearly, none of these fields is monolithic. Each one gives rise to a range of specialized educational proposals stemming from different sociocultural and educational paradigms (Bertrand and Valois, 1999, pp 43-60). Therefore, it is important to explore the various currents of theory and practice in each field to select those elements that suit the paradigms we adopt, our objectives, and the context in which we are operating.

The selection of components for our theoretical framework is guided by a core conception of education as more than the mere transmission (for “assimilation”) of information aimed at raising awareness or delivering instructions to trigger behavioral change. Education is an active process undertaken with and by people, preferably in a group or community dynamic. In this view, a community investigation or collective-action project is not merely a framework for the inclusion of exogenous communication strategies (to induce ecocivic behaviour for example); for the participants, this type of project will itself become an educational process. Education concerns the development of autonomy, creativity and critical thinking (notably, with regard to gathering information, analyzing socioenvironmental and health issues, searching for solutions and making decisions), and of a will and capacity to act among the participants (Freire, 2001; Sauvé and Orellana, 2001). Nowadays the reliability of scientific knowledge, the appropriateness of a technological mode of management and the legitimacy of the power of political decision makers are all under challenge (Bourg and Schlegel, 2001; Fisher, 2002, pp 2-4). Consequently, it is important to promote a type of education that centers on appropriation by citizens of realities that concern them and fosters their cooperation in any effort to define and implement precaution and prevention policies and strategies. This critical type of education, as a political praxis (Gutiérrez, 2002), leads people to question political decisions (or inertia), demand accountability on the part of decision makers and governments, and take part in the political dynamics and the problem-solving process.

In accordance with this view of education, we have adopted the following two fundamental principles to guide the theoretical and practical choices in developing our proposal: the ecosystem/holistic approach and participation, which, as we shall see, significantly echo each other.

### **Ecosystem Approach - Towards a Holistic Perspective**

The signification of “ecosystem approach” varies following different authors and organizations depending, first, on their notion of “ecosystem” (for example, the naturalist/conservationist one or the conception derived from humanist environmentalism) and, second, on their environmental

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<sup>3</sup> The specific presentation and discussion of the process and results of the Lac Saint-Pierre environmental education project is the object of a forthcoming paper. In this article, selected observations from of the Lac Saint-Pierre case study will help illustrate some elements of the theoretical framework we are constructing.

ethic (for example, anthropocentric, biocentric or ecocentric). After examining a number of definitions, we felt the need for an explicit formulation of the elements and principles that we consider to be key. The ecosystem approach tends to deal with the life systems of a given milieu in a comprehensive manner and to take into consideration its many diverse components and the dynamics between and among them. Human communities are thus an integral part of, and interact with, the ecosystems that make up their environment (as in the noncentered ecologism, characterized by Whiteside, 2002). However, the ecosystem approach also recognizes that, quite apart from their usefulness to humans for production, consumption, and the absorption of waste, life systems have inherent value and are thus worthy of conservation or restoration. More particularly, the ecosystem approach, as applied to human health issues, seeks to understand the linkages between human health and environmental conditions with the aim of promoting community health (Guérin et al., 2003; Lebel, 2003), which is bound up closely with ecosystem health (Mergler, 2001).

A critical perspective is, however, needed when adopting an ecosystem approach; for it is rooted in a rational epistemology, which has both advantages and limitations. The systemic approach, which applies systems theory to the study of socioenvironmental realities and issues, is often associated with the instrumental-rationality paradigm that underlies the fields of environmental “management”. Such a specific, positivist approach focusing on measurable cause-effect-remediation relationships, is of limited value, though, and may well be inappropriate or problematic. To counteract this limitation, Morin and Kern (1993, p 188) call for a rationality that considers real beings, subjectivity, affectivity, and life: “It must allow place for myths, for emotion, for love”; it must include culture and politics in its understanding of natural process. Beyond systemic rationality (inclusive though it may be), there are other ways of approaching reality; the ecosystem approach becomes more meaningful as part of a holistic perspective that gives place to other—creative, intuitive, symbolic, and experiential—ways of apprehending the world (Barbier, 1997).

Because it seeks a comprehensive understanding of reality, the ecosystem approach calls for the integration of different types of knowledge, such as knowledge from the various biophysical and human sciences, experiential knowledge, local knowledge, common-sense knowledge, and traditional knowledge. Moreover, the holistic approach involves consideration of different relational and interpretative schemas. Such a dialogue among different types of knowledge and ways of relating to the world essentially calls for the participation of the various actors concerned with a socio-environmental issue.

### **Participatory Approach**

“Participation” is one of those “sponge words” that can absorb multiple meanings; it is therefore important to specify how we use the term. In the frame of reference we are developing for environmental health education in the context of the Lac Saint-Pierre project, we consider the following approaches, inspired mainly from Biggs and Farrington (1991, in McAllister, 1999), McCall (1987) and Ashby et al. (1987): 1) cooperation: participants (community members, researchers, educators and other partners) work together from the design of the work plan (investigation, educational intervention, or environmental health action plan) to the ensuing evaluation process; 2) co-learning: participants share their knowledge in order to construct contextually relevant knowledge; in this way, they can advance towards 3) collective action, in

which community is setting and carrying out its own agenda; 4) finally, collegiality involves improving the participants' investigative and educational capabilities, so that they can gain autonomy as researchers or educators. Participation is thus not perceived as a mere instrument for facilitating implementation of external interventions, or enabling the public to collaborate in a predetermined decision-making process, or validating the formulation of external political interventions. Its goal is rather for social groups to critically and responsibly address collective issues; it thus implies their gaining access to the resources and processes of decision making and control.

The participatory approach responds to the need to adopt a particular epistemological stance, a process of co-constructing knowledge that calls for the legitimization of different types and modes of knowledge construction and solution seeking, thus taking into consideration the full range of ways reality may be apprehended (Park, 1999; Leff, 2002). For example, the identification of a fish-sampling zone drawn on theoretical ecological mapping should preferably be validated by fishermen's experiences. Also, if scientific results show that most mercury is methylated in wetlands, there is a need to collectively discuss such information so that it would not be used as an argument for halting lakeshore rehabilitation projects in the endangered wetland ecosystems. Our experience in Lac Saint-Pierre allows us to observe that a participatory approach to such a socioenvironmental issue fosters the adoption of an ecosystem/holistic approach: the various concerns among participants led to the mercury problem being reframed as part of the larger issues of food security, general environmental health, and environmental restoration. When asked to discuss the mercury problem, people quickly "digress" to such questions as parasites, declining fish stocks, supermarket food labeling, falling water levels, the presence of other contaminants, and the local fishing economy. Participatory dynamics thus "bursts" the mercury issue at stake and helps bring to light the multiplicity and complexity of ecosystem relations.

There is, as well, an ethical concern, along with the epistemological one. Guattari (1992) notes (p 104) that, with regard to the environment, "Cognitive processing is inseparable from human commitment and from the choice of values it involves". Participation elicits reflection about the purpose of the knowledge that is produced, particularly about its relevance and usefulness to the social groups concerned (Robottom and Sauv e, 2003). It encourages them to assume collective responsibility for the shared environment, which includes making political claims and taking political action. Furthermore, since decisions and actions are founded on value systems, the participatory approach provides an excellent framework for clarifying and discussing each participant's ethical standpoint. For example, in Lac Saint-Pierre, the contamination issue must be examined in terms of the conservationist values of some ecological associations, the economic values of commercial fishermen, the aesthetic and cultural values of lakeshore residents, the food-security and health values of women groups, and so on. Ethical considerations involve a process of democratic discussion about a reality in a particular context, which elicits the different perspectives held by different actors and experts and, preferably, by different cultures, so as to expand the range of possibilities for relating to the world and enrich reflection (Roy et al., 1995; Jickling, 1996).

Furthermore, the participatory approach responds to a strategic—one might even say pragmatic—concern. Because participation brings together different types of people as stakeholders, it helps them identify and pool their skills and resources (such as financial resources, political backing, or logistic support). Because it stimulates individual and collective investigation and discussion, it

can also foster a better appropriation of knowledge by the communities concerned and open up a broader range of possible solutions. Moreover, because these solutions are endogenous (or have been chosen, discussed, and reframed by the people involved), participation fosters their sense of “ownership” of the project and enhances the community solidarity needed to implement the desired changes, as well as the motivation to develop the necessary competencies. In our Lac Saint-Pierre project, for example, fishermen are proud of local experience accumulated over many generations, and participation allows valorization of their diachronic, large spectrum (all over the lake) and often fine tuned (from daily sensorial observations) collective knowledge and know-how in the investigation process.

Finally, the participatory approach can be considered from an ontogenical perspective. Under optimal conditions of communicative action (rooted in a participatory democratic process, as Habermas [1987] puts it), participation can foster social development. When associated with relevant issues that present meaningful challenges in a context of “being together” participative investigation and action can enhance and reinforce the capabilities of community stakeholders, stimulate their sense of belonging to their milieu or bioregion, and hone their skills for solving problems or carrying out constructive projects.

These four complementary perspectives on participatory approach point up just how important it is for the various stakeholders in a socioenvironmental situation to be committed to studying it and engaging in the processes of problem resolution or of developing constructive projects. Participatory engagement can be highly educational since it provides an opportunity for learning together about significant realities through investigation and action (LeBoterf, 1981; Heron, 1996; Lammerinck, 1998). The diversity of the participants enhances the process.

Adopting a participatory approach does, however, entail a number of significant challenges. The first is of an affective nature: participation implies an experience of otherness. The experience is often destabilizing and may induce fear, suspicion, and alternating “withdrawals and confrontations” (Zay, 1994); participation involves learning how to learn, to work, and to live together. Then, there is an epistemological challenge related to the culture shock among the various disciplines, sectors, and communities involved. Also to be taken into account is an ethical challenge regarding respect for each participant’s “space” for freedom and integrity. Beauchamp (1997) raises important issues of power relations in “participatory” processes; for example, manipulation and misinformation. Furthermore, as observed by Anadon et al. (2000) and Sauvé et al (2001), there is a strategic challenge to contend with, entailing transparency, intersubjective communication, flexibility, the necessary appropriation of the project by its participants, and drawing up a timetable that allows enough time for all these demanding processes to be implemented.

Finally, when a participatory approach is associated with the idea of “community”, other challenges may arise. “Community” is another expansive “sponge word”. Communities of interest, neighbourhood communities, communities of practice, and so on, present different characteristics and dynamics, which influence the participatory process. The first question should be whether these individuals really form a community. The idea of a community may reflect a researcher's representation rather than social reality. “Community” may be an illusion. “Community” may be related to a naive perception or a deliberate strategy of generalization that

negates or erases individual or sub-group differences. “Community” may also serve as a false demagogic argument or as a “cover” for “good” social research. “Community” may be a social Utopia or even a trap for those confined in a stifling communalism. But a healthy community may also be a social project that participatory action can progressively help build up.

The following sections set out the choices we have made in terms of environmental education and health education in developing our frame of reference for environmental health education. As we shall see, these choices are consistent with each other and with the ecosystem and participatory approaches as we have adopted them.

## **Environmental Education**

The object of environmental education (EE) is not the environment per se; that is essentially what environmental science deals with. EE is concerned more specifically with the relationship of people and social groups to the environment. This relationship is largely determined by the representation of the environment each of us constructs (Sauvé, 1997, pp 11-15): whether we view the environment as nature, as resource, as a problem, as a place to live, as a landscape, as a territory or as the whole biosphere, as a community project, and so on. This mix of complementary representations has given rise to 15 different currents of EE theory and practice (Sauvé, 2003); for example, the naturalist, conservationist, problem-solving, and humanist currents. In constructing a frame of reference for environmental health education in the context of our Lac Saint-Pierre project, we have opted mainly for two of the newer trends: bioregionalist and “socially critical” environmental education. These trends differ from more traditional currents centered on knowledge transmission and behavioural change; they view the environment not only as an object of study, of civic respect, or sustainable management, but also as a truly collective project.

Bioregionalism is based on the potential for each bioregion (or living environment) to define and, if need be, develop itself as autonomously as possible. The natural and cultural elements of the environment are considered as precious resources, which a community may be able to use appropriately without damaging or exhausting them, insofar as people recognize and value their own talents and know their environment, its components, web of interactions, possibilities, and limits. With creativity and solidarity, a community can learn to identify and satisfy its needs mainly from resources available in its own environment; development can thus be more endogenous, stimulated by a sense of belonging to the place one lives in and grounded in an ethic of responsibility. The point is to value the local and regional culture and counter “cultural disintegration” and the disintegration of the community (Nozick, 1995). One of the main objectives of bioregional environmental education is to “reconnect” people with their environment, so that they learn to know it (and each other) better and develop a sense of belonging (Traïna and Barley-Hill, 1995; Pruneau et al., 1997); they learn to reinhabit their places (Berry, 1986; Orr, 1992) and make a commitment to their environment. There is a real basis for such a bioregional approach in Lac Saint-Pierre, which is a new Biosphere Reserve, since it is an area where there is both a need and a will to value and promote the rich local biophysical and cultural patrimony with a view to regional ecocodevelopment.

The current of socially critical environmental education draws on *critical theory*, which first emerged in the social sciences, entered the field of education (Carr and Kemmis, 1986) and, in

the mid-1980s, enriched reflection and practice in EE (Robottom and Hart, 1993). Essentially, in this current, the emphasis is on analyzing the social dynamics that underlie socioenvironmental realities and issues: the intentions, positions, arguments, explicit and implicit values, decisions, and actions of the various stakeholders in a given situation. Are the basic principles, as stated, consistent with the projects undertaken? Are words and actions congruent? Particular attention is devoted to identifying and analysing power relationships. This critical stance necessarily has a political component and is aimed at transforming reality. The criticism is thus not sterile; plans for action to bring about emancipation and liberation from alienation emerge from, or in, the course of critical investigations. Ultimately, this social action is aimed at transforming those involved so that they attain greater autonomy and empowerment. In Lac Saint-Pierre, critical questions help in the examination of a number of closely related issues, such as contamination, local and upstream municipal and industrial activities, agricultural practices, energy production and consumption, river transport, water levels, fishing activities, and declining fish stocks. Economic privileges, political inertia and food security are also scrutinized.

The bioregionalist and socio-critical currents are, as we can see, a good fit with each other and with the ecosystem and participatory approaches. We thus drew on them for our conception of environmental education as a process aimed at enhancing a community social dynamic towards people's appropriation of their own socioenvironmental realities.

## **Health Education**

The concept of health, like that of the environment, covers a polymorphous, complex, and changing reality. Bantuelle et al. (1998) identify a number of different dominant approaches to health: the biomedical approach focuses on the diagnosis and cure of health problems; the psychosomatic approach deals with the relationship between physiological and psychological factors; the anthropological approach conceives of health or disease as a cultural construct; finally, in the ecological approach, health is viewed as a state of equilibrium between individuals and their environment. This last approach, enhanced by the anthropological perspective, is in tune with the ecosystem approach and thus seems to us to be an appropriate one to take in the context of environmental health education.

Moreover, like EE, the field of health education has given rise to a number of different currents of theory and practice, each of which rests on an underlying conception of health and health interventions (Giordan and Girault, 1996; Gaudreau, 2000). So far, in responding to public-health and health-promotion concerns, the principal approach has been to rely on expert opinion. In the cognitive current of health education, the focus is thus on the transmission of knowledge, while the behavioural current centers on behavioural change. Other currents, however, focus on the interactions between and among individuals, society, and the environment; on people assuming responsibility for themselves; on empowerment; and on participation in collective action (Bury, 1988; Bantuelle et al., 1998; French, 1990, in Gaudreau, 2000). The radical humanist current (described by Taylor 1990, in Gaudreau, 2000) thus stresses, among other things, self-discovery, mutual aid, consideration of the affective universe and of the socioeconomic determinants of health, liberation from alienation, development of community projects, and social and political mobilization. In accordance with the analysis of Gaudreau (2000), the radical structuralist current is centred on raising social consciousness regarding conditions in the community, conditions

affecting health that depend on social-power relationships. In this context, learning involves critically confronting realities and is oriented towards social reconstruction.

The connection with the bioregionalist and socio-critical currents in environmental education is easy to make. Radical humanism and radical structuralism seem particularly suitable to enriching our proposal for environmental health education, which centers on participatory and holistic approaches. The point is not merely to prevent health risks by drawing on expert advice, but to make the relationship to health part of the basic education of individuals in their social group. For example, in Lac Saint-Pierre, participants learn to clarify the relations between the water flowing in their landscape and the life flow passing through plants, animals, and their own body. They learn to deal with decision making considering both the health advantages and the potential risks of consuming lake and store-bought fish. They learn to consider health as a collective concern, as a political issue.

### **Environmental Health Education**

Our proposal for environmental health education integrates elements of the associated educational fields outlined in the previous sections. Health education is not just instrumental, not merely a contribution to health promotion. Nor is environmental education simply a tool for problem solving or environmental management. Both involve a concern for developing essential epistemological, critical, ethical, political, and strategic skills in individuals and social groups, which implies adopting the closely interrelated participatory, ecosystem, and—moreover—holistic approaches.

Environmental health education, as we conceive it, is a process aimed at optimizing how individuals and social groups relate to realities located at the interface between the environment and health. This conception is not concerned merely with managing public health by preventing harm (disease, damage) from environmental stressors. It involves a more ecosystemic and responsible vision (as suggested by Labonté, 1993, 1995; and Haglund Bo, 1997, among others). Environmental health education should deal with the following realities: the links between human health and the quality of life systems (ecosystem integrity); the quality of life of humans and other living beings in relation to environmental conditions (biophysical conditions, which are closely related to sociocultural conditions); the effects and impacts of human activities on components of the environment and its dynamics, which may in turn affect human health; evaluating the health risks associated with environmental factors and life styles; individual and collective solutions to problems that may arise “upstream” (in components of the environment) and “downstream” (in human health); and conditions for well-being in relation to the environment, that is, the conservation or creation of environments that foster health and the adoption of ways of relating to the environment that promote both human and ecosystem health.

In the context of our Lac Saint-Pierre project, environmental health education is closely linked to the notion of risk. The issue is the potential or actual damage to the integrity of the ecosystem and to the health of riverside communities by environmental contaminants, with specific reference to mercury<sup>4</sup>. The field of risk education does, in fact, suggest some approaches: for instance, the

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<sup>4</sup> In Lac Saint-Pierre region, measurements made to date show that, while mercury is present in the ecosystem (located downstream from large discharges), the mean concentration ratios in fish and humans are relatively low

neo-behaviourist approach, centered on attitudinal change, as proposed by Riechard (1993), and Gregory's (1991) cognitive approach, centered on the development of critical thinking. However, risk education is not yet as well developed as are the fields of environmental and health education. We thus have to delve into the realm of risk communication to find a call for a participatory approach (as in Burger et al., 2003). Increasingly, it is realized that approaches based on risk communication that draw on "expert" opinion and are associated with instructions for behavior are often ineffective and unsuitable for introducing real risk-management skills into communities (Lemieux and Barthe, 1998; Fisher, 2002). Communities have at times found themselves at a loss and plunged into doubt when given firm directions that are, nonetheless, marked by scientific uncertainty. When the message communities received did not make the significance or meaning of the risk clear or take sociocultural factors into account, communities found themselves unable to evaluate the advantages and disadvantages of consuming certain foods (Larue et al., 1997; Penn, 2002). Consistent with the educational choices explained above, we have therefore selected the approaches in which "scientific authority gives way to collective experimentation, which mixes laboratory science with local knowledge so as to clear the way to new types of learning" (Estades and Rémy, 2003, p C-4).

Environmental health education, as it is being put into practice in the Lac Saint-Pierre project, is rooted in just such collective experimentation and involves learning together and appropriating an issue collectively. We prefer a proactive, ecocentric approach focusing on participation by the individuals and social groups concerned to a reactive, anthropocentric one based on expert opinion. The point is to set in motion a participatory dynamic that fosters exploration and understanding of the complex interactions between and among individuals, their social group, and their living environment, as they apply to health, and that also fosters the design and implementation of projects aimed at improving this network of interactions.

Environmental health education is thus rooted in community reality; it takes into consideration the structure and very essence of the group, including the community culture. Participants appropriate a critical investigation of the reality that affects them and adopt a holistic, ecosystem approach. Such an exercise, as Alzate-Patiño et al. (1994) confirms it, sparks "dialogue" among the various type of knowledge, so that an appropriate and relevant knowledge may be constructed collectively. It also spurs commitment to, and active and creative participation in, processes of problem solving (reactive approach) or project development (proactive approach), including the political dimensions. Furthermore, it enhances reflection in action (the exercise of praxis) to develop an endogenous theory of the relationship to, and social action about, environmental health. The objective is to develop both a will and a power to act that center on an ethic of fundamental responsibility (responsibility for being, knowing, and acting, as examined by Sauvé, 2001). To this end, it calls for contributions by different actors of the "educational society" (at different levels of responsibility), creates partnerships and stimulates cooperation<sup>5</sup>.

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(COMERN, 2003). For the moment (and contrasting with previous conclusions of some studies some decades ago), mercury does not seem to be a worry. However, research is continuing in order to acquire a better understanding of (a) mercury dynamics in the lake (whose configuration is such, due to its shallow zones, as to promote methylation and, consequently, bioaccumulation) and (b) the subclinical effects of repeated low doses on health (Lebel et al., 1998 ; Dolbec et al., 2000).

<sup>5</sup> Such collective experimentation is consistent with the principles of community education (Jarvis, 1995) and popular education (Maurel, 2001). It is inspired by the theories of communicative action (Habermas, 1987), social

## Lac Saint-Pierre Case Study

Turning now to a brief discussion of the practical form that the environmental health education process takes in the context of Lac Saint-Pierre COMERN project, we must first point out that the mercury issue came to the fore because of concerns expressed by the network of biochemistry and health researchers. It was not raised by the community itself. Our education team therefore faced a particular challenge since we do not usually deal with situations in which the issue at stake is an exogenous one. In such a context, how does one go about addressing the mercury issue with the lakeshore communities? Elements of an answer can be found only by adopting an ecosystem-approach. Mercury is an intriguing “traveler” though the web of life (including the commercial food system): it thus provides an interesting “story” through which people can examine the complexity of environmental realities while learning how to deal with such complexity and uncertainty in a problem-solving process. It also appeared to us that (as the focus of a well-publicized ongoing study in the region) mercury might be considered as the subject of an initial set of questions, which would then provide participants with an opening to the general issue of contamination as well as to related political, economic, and other social issues. Concern about fish contamination (in relation to human health) thus leads progressively to a consideration of the global issue of food-quality security in relation to human health and ecosystem integrity.

In undertaking the process outlined below, we first interacted with key stakeholders, people in charge of regional associations and organizations in the health and environmental fields. We then worked with the members of some of these organizations: fishermen (from sports and commercial fishing associations), women's groups, and young people (college students) from the region. The following (non-linear) steps were adopted:

- Clarification of the social representations of (a) the environment (Sauvé and Garnier, 2000), and health (Gaudreau, 2000), (b) the linkage between them, (c) the specific issues of water and fish contamination (including by mercury), (d) the associated risks, and (e) the credibility of scientific knowledge and of media information. Social representations are closely related to action and constitute the “windows” through which learning is constructed; they must thus be taken into consideration in deciding on educational interventions. Characterizing the learners’ social representations (principally through interviews, focus groups, and participant observation) contributes to designing more appropriate educational strategies. Moreover, it is, in and of itself, an educational act since it implies the learner becoming aware of his or her own relationship to health and/or the environment with the aim, if need be, of considering a transformation.
- Participatory investigation (through workshops, field trips, interviews with different stakeholders, etc.) leading to a diagnosis of the socioenvironmental situation and helping to reframe the issue and seek optimal, realistic, and socially desirable solutions.
- Design and experimentation of educational intervention projects with members of reference social groups: for example, the collective production with the fishermen’s group of a contextually and culturally appropriate and annually revised “fish consumption

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action (Zuñiga, 1994), and community action (Lamoureux et al., 1996). Explanation of these principles is unfortunately beyond the scope of this article.

logbook”, which includes critical questions and provides the space and tools for an ongoing inquiry process.

- Identification and formulation of elements of an endogenous theory of social action for environmental health through a process of reflection in action (praxis), stimulated by critical questions from the leaders (animators) and other participants.

This process, which is currently underway, enables us, among other things, to validate and progressively enrich our initial theoretical proposal regarding environmental health education.

## **Transferability**

Clearly, the environmental health education proposal we have constructed as part of our research and intervention project in the Lac Saint-Pierre region reflects a particular undertaking in a specific context. Nonetheless, it seems to be transferable to other community-education contexts, including the implementation of Québec’s new Water Policy (Gouvernement du Québec, 2002). Indeed, the Québec policy (like other recent national policies, such as Mexico’s) centers on watershed-based management (a bioregional-ecosystem perspective) and promotes a participatory approach. It also involves the transfer of information, consciousness raising, and the mobilization of “water stakeholders”. Such an initiative represents a great opportunity to promote environmental health education as a participatory holistic process aimed at fostering appropriation of the realities and issues by the communities concerned; furthering collective construction of useful, meaningful, and relevant knowledge; stimulating problem-solving processes and the development of constructive projects; and thus promoting community well-being in relation to the health of aquatic ecosystems.

In conclusion, it can be seen that our environmental health theoretical proposal chimes well with a number of interesting environmental health action projects and guidelines (for example, Brown et al., 2001; U.S. Department of Health and Human Services, 2001; Rao et al., 2004). They share a similar concern for a participatory approach, for grounding the process in the community, for addressing relevant local or regional issues from a global perspective, and for fostering individual and collective action. They also consider health and the environment from an ecosystem (or, at least, systemic) perspective. The distinctiveness of our proposal lies in the fact that it makes explicit and characterizes the potential educational dimension of such projects. Participation is not only an appropriate operational strategy for promoting environmental health; it may also become a community education process in itself. It is considered a crucible for an epistemological heuristics, for the co-construction, validation and appropriation of knowledge. It also has an ontogenetic dimension and contributes to personal and collective development towards autonomy and critical involvement in social and ecological affairs related to environmental health. Although our proposal includes elements that have already been (implicitly or partially) adopted by authors or projects focused on community action, its distinctive contribution stems from our effort to make explicit, integrate and reframe these elements in an educational perspective. Our theoretical framework is also the outcome of an original effort to bring about a coherent integration of different theoretical elements from the principal contributing educational fields: environmental education, health education and risk education. Emphasis is placed on the importance of, among other things: integrating reflection into action; learning to learn, live, dream and act together; fostering a sense of belonging to the web of life, to

our biotic and human community; and adopting a critical perspective on socioenvironmental and health realities.

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