

Research Symposium

Students' Decision-Making Process while Involved in Sustainable Development Projects

Diane Pruneau and Anouk Utzschneider

Université de Moncton, Canada

Abstract

In Canada, a new residential subdivision has been planned according to the principles of Conservation design. Before the construction, 6th grade students played the future residents' roles and had to make decisions on critical aspects related to their way of life. While the students were involved in making choices, researchers investigated their decision-making process. The students always had to make two decisions: one without guidance and the second after reading ecological information and discussing it with their fictional families. Students were also taught to determine their personal goals, to list many alternatives and to make their choice using critical thinking skills. Individual interviews, students' reflective journals and the researcher's journal were used as data collecting tools. In their initial decisions, aesthetic elements, personal preferences (I like that), practical aspects, human health and recreation guided students' choices. Later, students' goals were still self-oriented, but environmental considerations were observed. Some students tended to make more and more compromises in their decisions. At all times, the students considered the present and the short-term future in their decisions. It seemed possible to progressively educate the students to make more environmental decisions, but the process asked a lot of effort from them.

Acting according to the principles of sustainable development requires a capacity on the part of individuals to make decisions that take the future into consideration. Decisions affecting environmental processes, however, are among the most difficult to make because of the complexity of the relevant issues, the multiple and conflicting values involved, the limits of available information, long-term impacts, the various decision-making levels, and the pressures of time and budgets (National Research Council 2005). Research on decision making, though done in contexts different from that of sustainable development, highlights the fact that people often make inadequate decisions because they more often think about the present, giving priority to current advantages, as well as making emotional rather than reflective choices (Baron and Brown 1991). What about young people's environmental decisions? What elements do they consider in this type of decision? Do they think about flora and fauna? Do they reflect on the long-term impacts of their decisions? Are their decisions considered or spontaneous? And finally, can they be taught to be better decision makers?

This article describes an experiment in which 6th grade students were invited on several occasions to make decisions related to their way of life in a residential subdivision. Through the experiment, we attempted to teach them a structured and considered decision-making process. This article also reports on children's goals during the decision-making process, the number of alternatives they come up with, their capacity to think about the future, and their metacognitive strategies.

THE DECISION-MAKING PROCESS

Yates and Palatano (1999) define a decision as a choice made in the context of various cognitive actions and whose goal is to produce a satisfactory result. According to Yates, Veinott and Palatano (2002), five criteria contribute, wholly or partly, to qualify a good decision: the decision's capacity to achieve the desired goal, its capacity to satisfy the decision maker's goals, its capacity to meet several criteria of quality at the same time, evidence of the chosen alternative's superiority, and its low costs (in time, money and effort). Welch (2002) has identified the three steps of an efficient decision-making process: Identification of goals, production and evaluation of alternatives, and choice of an option. In this efficient process, deliberation is omnipresent: The decision maker generates several alternatives, predicts, weighs and chooses an action whose consequences were first evaluated (McCutcheon 1995).

This ideal decision-making process isn't always present in individuals however. Some decisions are made indifferently, spontaneously or emotionally. Wright (1994) reports that individuals have a tendency to accumulate evidence supporting only one side of an argument with the objective of convincing themselves as much as the other people concerned. Berthoz (2006) also remarked that the arguments used are sometimes overly simple and of a non-quantifiable nature. Decision makers also have difficulty clarifying their objectives (March 1978), identifying alternatives (Keeney 1992), structuring their decision-making process (Simon 1990) and foreseeing the consequences of their choices (Baron and Brown 1991).

Decision-making in children is less documented than in adults. In situations other than environmental, children would think more often of the present, attributing importance to current advantages and inconveniences, as well as making emotional

choices more often than considered ones (Baron and Brown 1991). Crick and Dodge (1994) indicate that children often use simplified cognitive structures (i.e. heuristics, schematics, models) in order to manage the different elements involved in their choice. According to Kindt, Brosschot and Everaerd (1997), children favour emotional factors in their decision making, particularly those related to physical suffering. However, Baron and Brown (1991) maintain that children can be taught to make better decisions, notably by allowing them to practice with the help of fictional scenarios. Kuhn (1993) even estimates that children could develop certain metacognitive abilities linked to decision making, such as the coordination of their initial theories with new information in an explicitly conscious and controlled way.

METHOD

The exploratory research attempted to describe the way in which 6th grade students make decisions regarding the environment, in the context of a sustainable residential subdivision. The first objective was to describe how students spontaneously make decisions related to their way of life in a residential subdivision, that is to say, before any pedagogical intervention is made to turn them into better decision makers. Following students' learning some decision-making steps as part of a sustainable development project, we wanted to see if students could improve their decision-making process.

The research, conducted over 9 months at a rate of two 2-hour interventions a week, was realized with a 6th grade class in Dieppe, Canada. The choice of 11-year-old

students was based on two principal elements: Around the age of 11, children move from anthropocentric reasoning to reasoning that takes into account human beings' impact on the environment (Kahn and Lourendo 2002); some students at that age recognize that animals can feel sensations (Kellert 1995).

A global simulation was employed. The simulation's context was a new sustainable residential subdivision, the Village upstream actually to be built in Dieppe in the spring of 2008. The development's promoter chose to do so according to several principles of conservation design. Students participating in the project first had the opportunity to visit the wild area to discover its flora and fauna. Then, students each received a fictional identity and were grouped into families. Students, now as future residents of the sustainable residential subdivision, were invited to make decisions throughout the school year regarding ground cover, plants to seed in their yards, and pet and mosquito management. For each situation, students were invited to spontaneously make a pre-decision, then a real decision after having received scientific information and having discussed it with their fictional families. From September to December 2006, students were free to make decisions in their own way. From January to June 2007, researchers attempted to improve the students' decision-making process by showing them steps to better decision making: Identification of personal goals, formulation of multiple alternatives, and prediction of possible consequences for each alternative.

In order to describe students' decision-making process, various data collection tools were used: the students' reflective journal (Hammond 2002), semi-directed interviews, and the researcher's journal. Throughout the project, students placed in their reflective journals schematics, drawings, words, lists, etc. to illustrate their decision-

making process. The journal is also where they answered specific questions like: How did you make your choice? Write down all the reasons why you made that choice. What were your decision's goals? What were the possible alternatives? Explication interviews allowed researchers to better interpret students' reflective journals before and after having initiated them to certain steps of the decision-making process.

Two researchers analyzed the data according to the following steps: General reading, data codification and grouping of codes into categories (individually), comparison of categories found, analysis, and writing of narratives or table construction (according to data types).

RESULTS

The elements observed in the research data were the children's goals during their decision making, the number of alternatives considered, the affective or cognitive elements influencing their choices, their capacity to imagine the future, and the metacognitive strategies they used to make their choices.

At the project's onset, we observed that students took quick decisions, were little conscious of their personal goals, and barely monitored their decision-making process. In general, they listed no more than two or three alternatives. The elements they considered were of an egocentric nature and reflected their preferences (I like that) or their interest in the practical, aesthetic, sanitary or recreational aspects of the residential site. Environmental elements (the health of ecosystems) were little present in their simple deliberation process.

As a result of the project, students learned to determine one or two personal goals for their decisions, and some environmental considerations were progressively included in those goals. These environmental considerations eventually made them compromise between their personal preferences and the preservation of ecosystems. For example, Marianne chose to own a pet because she liked animals. However, she would keep her pet inside to prevent it from hunting native species on the site. Impacts on animal life matter a great deal to this age group, though they think far less about their choices' impacts on plants or other biophysical elements. Students also increased the number of alternatives considered in their decisions. From one or two alternatives, they went up to three or four, depending on the nature of their decisions. We also noted the appearance of a desire to make better-informed choices, as manifest in their use of metacognitive strategies: Discussion with their family, priority given to morally viable alternatives or favourite elements, avoiding the worst, composition of a future scenario to better foresee consequences, etc. Students nevertheless modified their capacity for considering the future only slightly as a result of the project. The periods considered in their decision-making process remained the present and the short-term future.

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