

# **Educational Opportunities for Environmental Studies 2**

Emily Bourque  
Bonnie Ho  
Justin Lutchin  
Heather Ray

Prepared for ERS 250

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## **Abstract**

Environmental education is important. The Environmental Studies 2 building (ES2) at the University of Waterloo has been recently vacated, allowing for ‘greening’ initiatives to be proposed for ES2. Should any of these initiatives be implemented, it is vital that the University of Waterloo community, and the community at large, be aware of the benefits. A self-guided tour through ES2 would provide the best method for educating visitors to ES2.

## **Introduction**

### *WATgreen*

WATgreen is “an educational initiative for the students and the University [of Waterloo]” (WATgreen Homepage). Established in 1990, WATgreen strives to turn the University of Waterloo into a “showcase of sustainability” by offering new opportunities and directions for education and research, to students, faculty and staff (WATgreen Homepage). The WATgreen Advisory Committee includes members from faculties across campus, as well as student and staff representatives. The Committee examines environmental issues affecting the entire campus, from paper use to solar energy, and provides recommendations and/or a venue for the “mobilization of resources”.

### *ERS 250*

“Greening the Campus and Community” (ERS 250<sup>1</sup>) is a course offered by the Department of Environment and Resource Studies at the University of Waterloo. As a mandatory course for all undergraduate students enrolled in the Environment and Resource

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<sup>1</sup> “Greening the Campus and Community” was previously classified as “ERS 285”.

Studies program, ERS 250 gives students a chance to look at an environmental issue affecting campus, or the community at large, and to recommend methods of environmentally-oriented improvement (Department of Environment and Resource Studies). One of the course's main goals is to "contribute to campus sustainability" (Kay).

When this course was initiated in the fall term of 1990, it was "a crucial nexus for consolidating WATgreen activity during [WATgreen's] initial startup" (History of WATgreen). Since 1990, close to two hundred student projects have been archived in the WATgreen database, examining issues from policy and planning to water to landscape practices (WATgreen Student Projects). Over 15 of these student projects specifically examined environmental education activities (Education – WATgreen).

## *ES2*

Educational opportunities are abundant throughout the campus of the University of Waterloo. However, the Environmental Studies 2 building (ES2) has many unique opportunities. Since the building is currently vacant, the planning of the direction and location of the proposed project is not restricted by anything other than the existing building envelope. ES2 also contains no existing environmental projects that an educational framework must be based upon, allowing for the freedom of ideas. The fact that there is no existing educational base in ES2 presents problems for implementation because of the unfamiliarity of what will accomplish our goals. The use of an existing building envelope restricts the structure to the means of presenting information, since we cannot alter the basic framework of ES2.

## *Chosen Area*

Our team was required to examine educational opportunities. Since the topic of educational opportunities is broad, we needed to identify what we considered important to our idea of educational opportunities within ES2. We decided that we would look into the idea of environmental education.

## **Purpose of Our Project**

The purpose of environmental education is “to teach people to understand their total environment, not only what it was, but how it worked, as well as why problems existed and what it would take to ‘fix things’” (Cook 3). We wanted to incorporate the environmental education purpose within our project purpose. We chose to focus on educational opportunities in the Environmental Studies 2 building (ES2). We wanted to develop a project based around the concept of environmental education for everyone, regardless of education, age, or experience. We hope that visitors and students, both in the environmental studies program and in other programs, will leave the Environmental Studies 2 building with a better understanding of what environmental studies is, how it fit into the world as a whole, and how it applies to them.

This concept was developed because we felt that ES2 is not an established focus for environmental education. Though ES2 is planned to contain offices and facilities for the students and faculty, becoming a hub for the environmental studies program, ES2 lacks the ability to call visitors and students towards environmentalism. We want the building as a whole to be a centre for environmental learning.

*WATgreen*

Education is a fundamental part of WATgreen. In fact, “the cornerstone of WATgreen is education” (WATgreen – The Future). From this statement it is clear that WATgreen’s goals and plans are greatly based on educational opportunities. The very function of WATgreen, to improve the environment on campus, includes education because WATgreen exists in a university, often soliciting and including efforts and ideas from the student body. It is also evident that WATgreen promotes environmental education because its own efforts are aimed at both the campus environment and the student environment.

## **Objectives**

We formulated a number of questions that we needed to answer in order to achieve these goals. In order to evaluate our concept of environmental opportunities we needed to examine and answer these following questions

1. What is the best location for environmental education in ES2?
2. What is the appropriate target audience for this education?
3. What is the best method for presenting information? How will this information be communicated?
4. What information will be included in the content of our tour?
5. What is the most effective way to display environmental information?
6. Who will operate the displays?
7. Who will maintain the exhibits?
8. How do we use the building layout effectively?

In contemplation of these questions and their answers, it became evident that our focus should be narrowed within one physical area of ES2. From that it was decided to concentrate our efforts, but not limit our efforts to the question:

*How do we make Stairs One an environmentally educational experience for all visitors of all ages?*

## **Background**

Through the research done into the various methods of providing education, several key factors became apparent. First, as was stated by Nicolaas du Preez and Maryna Mohr-Swart: “the curriculum has to adapt to reflect trends in the external environment” (du Preez 13). Du Preez was talking about the ability of an educational system to change from a response of new demands from the outside world. The ability to change is an extremely important feature of any environmental education system as the needs and concerns of the environmental community change very rapidly. In order to grow and change with the times, an educational system must set forth a solid group of goals that exists for the sole purpose of evaluating new information, determining its relevance, importance, and plausibility, and finding ways to incorporate this information into the existing system. The ability of change confirms that new information can be assimilated into the educational system, and both teachers and students can be confident that this information fits in with the system being taught and that the information is valid.

Second, the opinion of Mrs. Jean Lutchin, an educator, suggests that information must be transferred from teacher to student in a relevant and interesting manner (Lutchin). Students tend to recall information more readily if they have seen the information in a memorable way

(interesting) and possess an obvious connection to the world they encounter every day (relevance) (Lutchin). The concern of interest is a widely debatable one. In our own experiences, we have encountered teachers who dress up like the subject of their lecture, stand on their heads for the entire class, and even bring in live examples of the subject being taught. The method of imparting information to students varies widely, and there seems to be no single system which works in all cases.

The latter concern of transferring information to students involves the relevance of that information to the experiences that students encounter outside the class room. Students often forget information that they do not use or see on a regular basis. While it cannot be helped that certain information will only have limited applications, the methods of showing these applications can often mean the difference between retention and dismissal. A useful method is to accompany information being 'taught' with real world examples. These can be anything from a sample of others using this information to questions that involve taking real world situations and evaluating them using the information presented. Using this method students see that what they are learning has a use outside the classroom (Lutchin).

Environmental education, as a component of the formal education system, has been present for at least the past 50 years. But, the purpose and aims of environmental education have shifted over the decades. In 1972, 'environmental education' was generally considered to focus on natural resource use, from a solely human-consumption perspective (Pieters 51).

Twenty years later, the United Nations Conference on Environment and Development (UNCED) defined 'environmental education' as "the process which provides an understanding of ecosystem complexity and the values and practical skills to participate responsibly and

effectively in establishing ecological sustainable lifestyles and environmental wellbeing” (Dingwall and Walton 109).

This broad definition lends itself to multiple objectives, including the objective of environmental education to increase awareness into the problems in this field (environmental) as well as possible solutions and “*to lay the foundations to a fully informed and active participation of the individual* in the protection of the environment and the prudent use natural resources” (Harris 1, emphasis added). This objective is vital as a tool in the current environmentalist movement. However, the importance of environmental education far exceeds a use as merely a crusade tool. Without the knowledge of environmental issues, ecological biodiversity, and ecological systems, the human population would be ignorant of the cumulative impacts of its activities, and would not be able to implement solutions, thereby leaving us desperate for life-support systems, like breathable clean air.

Along with the above-mentioned educational objective, four principles have been developed upon which environmental education can be based:

1. “Environmental education is a process of learning and adapting that is life long.
2. Environmental education involves every individual as a part of a community
3. Understanding is a complex phenomenon based on a synthesis of information and a personal or cultural ethic
4. Ecosystem complexity recognizes the underlying pattern of interrelationships, or causes and effects.” (Dingwall and Walton 109)

Bakshi determined three points by which any environmentally educational activity must satisfy, in order to be successful:

1. “The sources of the information must be from a variety of number of disciplines.

2. The target audience must include all ages and all levels of education, and not be confined to school-aged children.
3. The aim of the activity must be to change the attitudes and behavior patterns of the target audience, and enable citizens to respond to situations that affect environmental quality.”

(27)

“Environmental education as an explicit activity has had its roots in the school curriculum in subjects such as biology and geography” (Cullingford 21). Environmental education at the University of Waterloo is currently taught in the Faculty of Environmental Studies, in a formal curriculum setting. Courses deal with environmental issues and concepts such as sustainable environmental systems, environmental assessment, environmental law, environmental urban planning, and ecology (Faculty of Environmental Studies). However, in the 1980s many people, such as Jacqueline Cernat, believed that it was much more important to focus on informal education, for those who may not have access to a formal education system (Malaher 11). Increasing the amount of informal education available at the University of Waterloo would conform with principle 2, allowing every member of the community access to information, since access to ES2 is not restricted solely to persons acting within the formal education system.

## **Methodology**

### *Literature Review*

Environmental education has been discussed and debated for decades. Methods, trends, implications, target audiences, and pilot projects have all been written about at great lengths all over the world. In our literature review, we examined books, websites, and peer-reviewed

journals, as well as previous WATgreen projects that discussed environmental education. For a selection of the materials consulted, see Appendix A.

While our purpose in this report is to focus on environmental education in a specific setting, we felt it was necessary to examine educational methods, in order to establish the best methods for establishing a strong educational framework on which the environmental content could be applied. As such, we looked mainly at websites and books.

To establish the methods best for communicating environmental ideas and concepts, we reviewed literature that discussed the purposes, objectives, methods, history, implications and ideals of environmental education. This included many books and peer-reviewed journals.

The educational programs (environmental and otherwise) that we examined were offered by school boards, outdoor education centres, private companies, government agencies and non-governmental organizations. Since we assumed that the general public will have access to our end product, we also paid close attention to the target audiences of each of the educational programs, and attempted to cover programs targeting children, university students, adults, and the community at large.

### *Case Study*

An environmental education centre was selected based on the criteria of environmental content, use of display as a major method of communication, and availability of display content information.

### *Consultations*

As the field of environmental studies is constantly changing, we decided that a vital method of answering our research question would be to consult educators. Using a purposive sampling method, we contacted both environmental educators, and non-environmental educators. The aim was to establish which methods best educated the general public, and how to present environmental education for optimal learning.

In order to determine the most ideal method of communicating information within the confines of ES2, we contacted professors and staff at the University of Waterloo who work within the Faculty. This included staff and faculty members, which we selected through a hybrid convenience-purposive sampling method.

To start with, the group sorted the information we needed to know into four categories. It was decided that educational opportunities could be divided into environmental education on campus, environmental education off campus, non-environmental education in Canada, and non-environmental education outside Canada. We felt that these were the best ways to divide the topic since it created an almost equal distribution of work among us. We also divided where we would get our information into three key areas, those being: key informant interviews, literature reviews, and case study reviews. This provided us with a wide diversity of information from a variety of sources.

The results we obtained from these three areas were difficult to sort, as they were qualitative in nature. However, we tried to find any commonalities between the various sources and link them together, also further linking any common themes between our four categories. This was in order to find the most wide spread features that all sources saw as important to the educational opportunities. In this way, we could then identify what aspects of our educational opportunities would comply most with those of other successful institutions.

This idea for sorting is how we organized our results to find common themes. As a group we presented our most important findings and collectively tried to find the commonalities as well as those which were unique, yet seemed to be important and relevant. Additionally, we compared our information to some of the literature we reviewed as a whole to find ways which our combined themes paralleled applicable case studies and process. All of this combined to help us finalize the answers to our questions, the objectives of our goals, and our overall concept of educational opportunities.

## **Results**

As a team, we felt that the best location for environmental education in ES2 is Stairs One. We assumed that the Stairs One entrance is part of the main traffic flow of the ES buildings, because a bus stop is nearby and is located on the university's main road, Ring Road. Stairs One would serve as the 'gateway' to our exhibit. As explained in the case study of the International Antarctic Centre, a 'gateway' is important in the establishment of an educational framework (Dingwall and Walton 115).

In selecting the target audience for our project, most of the literature and research tells us that the focus should be placed on children. Environmental education should start in primary school, building on children's innate attachment to the environment. We also found that there are three levels of target audience that we could account for: school children, university students, and adults outside of institution (Bakshi 27). The research that covered environmental education for adults focused on technical aspects, yet omitted interactive possibilities.

In order to present information efficiently, the method must be interesting, relevant and use a variety of appropriate media (Dingwall and Walton 120). Dr. Stephen Murphy, a professor

in the University of Waterloo's Department of Environment and Resource Studies, states displays should be interactive and the information presented should invoke a reaction from the participant (Murphy). According to Dr. Roger Suffling, a professor in the School of Planning, we also have to make sure we do not disrupt academic activities that are anticipated to occur in ES2 (Suffling).

In terms of the content of the tour, the information should be about the various environmental aspects of the building. In Stairs One, local issues and current environmental events, program information of all programs and department, and general ecological knowledge should be covered.

There are no specific methods to display environmental information. However, sensory stimulation and static display methods should be used.

WATgreen should be in charge of maintaining and operating the purposed tour.

## **Discussion**

Environmental education in ES2 is important because it “[increases] public awareness and concern of environmental issues, translating such awareness and concern into conscious action” (Zhu 65). We hope to create an educational tool that leads to an increased awareness of what it means to be part of the Faculty of Environmental Studies. We also want to communicate current information and events, opportunities for participation, and how ES2 is helping to ‘green’ the University of Waterloo.

ES2 will be the focus of the self-guided tour because this building will be the hub of the Faculty of Environmental Studies. Since there is no existing informal-educational framework to base our project on, our proposed self-guided tour will become the framework from which

further informal, environmental education will follow. In our case study of the International Antarctic Centre, the best location of visitor information was selected to be at the established “gateway to Antarctica”, which is Christchurch, New Zealand (115). In keeping with the decision made at the Antarctic visitor centre, we feel that the beginning of visitor information within should be located within the ‘gateway’ of the building, Stairs One.

Dr. Roger Suffling, a professor in the University of Waterloo’s School of Planning, alerted us that allowing a self-guided tour into ES2 comes with many security issues (Suffling). To minimize security issues and the possibility of disruption to academic studies, the location of the self-guided tour will be restricted to Stairs One and the hallways around Room 272. For a map of the tour route, refer to Appendix B. Since the final layout of ES2 has not yet been established, ensuring a small route for the tour will allow further ‘greening’ to take place in other parts of the building.

Despite that the majority of the literature gathered focused on the education of children, we feel that it is important to target on all ages. We have seen, through our research, that there is a lack of environmental, educational material directed towards a more mature audience. By educating all age categories, we will comply with Bakshi’s second point of targeting all ages and including all levels of education. To educate all age groups, concepts must be presented that are simple enough for children to understand, yet interesting enough to attract adults. Focusing on all ages will also allow the proposed tour to follow principle two of education, which states “Environmental education involves every individual as a part of a community” (Dingwall and Walton 109).

We were unable to discover any entrenched methods for the presentation of educational material in our research. However, we did discover that the method of presentation depends

highly upon the content of the information being presented. For example, exhibits in the Clay and Glass Museum of Waterloo utilize the actual objects for display (Freitag). If our tour included information about a rainforest, the display can only use models of that environment. A common theme in our research is the stimulation of multiple senses and the use of simplified concepts in an exhibit. In Austria, an “Environmental Pillory”, built in front of a school, contained drawings and garbage collected from around the area by a history class. This display significantly increased the villagers’ environmental awareness (Centre for Educational Research and Innovation 56). Our research also suggested no difference between the presentation of general, educational material and environmental, educational material. We propose that the tour incorporate both static and interactive displays. Having pamphlets and ‘do-it-yourself’ projects ready for visitors to take home, as suggested by Murphy, is a way to change the attitudes and behavior patterns of visitors (Bakshi 3; Murphy).

We submit that Stairs One be divided into three sections for education: local issues and current events, Environmental Studies programs, and general environmental education. Ideally, the body of the tour would include aspects of ES2 that are ‘green’. For example, information on solar panels, bio filtration, and any other possible ‘green’ components. Since no ‘green’ projects are yet implemented within ES2, Stairs One will be designed to catch the interest of people by displaying the vision of the Faculty of Environmental Studies. The local issues and current events display will be located along the north wall of Stairs One. Information regarding programs within the Faculty of Environmental Studies will be located on the south wall beneath the stairs. This will create space for students to congregate. The west wall of Stairs One will display a wall of fame which would be a “gallery of neat people who have gone on to do neat

things” (Suffling). The stairwell and second floor of Stairs One will contain general, environmental information. For a proposed design diagram of this area, refer to Appendix C.

Maintenance, including updating, of our project is vital to ensuring the material is relevant to visitors. Since WATgreen is experienced at overseeing ‘green’ projects on campus, we believe that WATgreen is best suited to determine specific content and to ensure continued maintenance. WATgreen could appoint students, recruit volunteers, or incorporate this project into an academic course.

## **Alternatives**

In designing environmental education opportunities in ES2, we encountered other methods of education besides the purposed self-guided tour. Due to various limitations, we chose to pursue the self-guided tour over the following.

### **1. Guided tour**

A guided tour would entail having a person, or persons, in charge of guiding visitors through the tour. The Earth Sciences Museum located at the University of Waterloo has a guided tour, but it is only open for select hours. (Museum Tours and Activities) However, we felt that this option would be a waste of financial resources.

### **2. External information presentation**

Information about ES2 and the way it is environmentally friendly could be made available off-campus, either through a website or by giving informative

presentations. For example, in the Kettle Creek Conservation Authority, a “Mobile Environmental Education Unit” was developed, where educators “travel to classrooms throughout the watershed conducting [educational] presentations.” (Education). We chose not to pursue this option because of limitations on time, participation, and finances. We also decided that it would be more conducive to our educational objectives to have the target audience in ES2.

### 3. Brochures or Pamphlets

Brochures, or pamphlets, detailing the environmentally friendly aspects of ES2 are useful. However, brochures are only a tool by which information can be communicated. While we do recommend the providing brochures to visitors to ES2, they will be used in conjunction with the tour. A 1996 WATgreen study of the Dorney Garden, located on the University of Waterloo campus, proposed the use of pamphlets to augment visitors’ knowledge of the Garden (Fedy *et al.*). Only publishing informative brochures about ES2 will not ensure visitors have the most effective tools for learning. The brochures could be lost or damaged, and will require constant updating, which wastes paper.

### 4. Nothing

Since there are no current activities or projects about ES2 that can be showcased, any presentation of information can wait until other projects have been implemented. However, we deemed it necessary to implement a framework for

educational opportunities immediately so that various projects can be expounded as they are created.

## **Limitations**

From the start of our research, it was evident that time was the main limitation to answering our research questions. Distance was another limitation, as many of the potential candidates for interviews or case studies were located outside the Region of Waterloo. As with any research initiative, response rates from interview candidates were beyond our control. After contacting eight faculty members and staff, for participation, only 3, or 37%, responded. Since the response rate was much lower than our anticipated 50%, we must assume that the information gathered lacks a full representation of the views of all faculty and staff. Possible reasons for this low response rate include a lack of time, and technological problems in communication.

Since ES2 is currently vacant, we are limited by our knowledge of what future ‘green’ initiatives will be implemented in ES2, as a result we do not know all the specific information that needs to be included in the tour. The implementation of our proposed self-guided tour may be further limited by funding, technology, and future trends toward environmental education.

## **Conclusions and Recommendations**

### *Conclusions*

The Educational Opportunities group of ERS 250 Fall 2004, considering available information, including WATgreen’s strong values toward education, feels that education is an extremely important aspect to ES2. We propose that a self-guided tour be used as a tool of

education, beginning with Stairs One and continuing into Room 272 of ES2. This tour will target a variety of age groups, allowing all members of the community to take advantage of the information presented. The tour will be centered on the ‘green’ aspects of ES2, but since nothing has been implemented yet, we have proposed a design for just the beginning of the tour, in Stairs One. Information will include local issues, program information and other general environmental information. The presentation of information should invoke one’s senses and contain information that is both interesting and relevant. A self-guided tour of the ‘green’ features in ES2 would “teach people to understand their total environment, not only what it was, but how it worked, as well as why problems existed and what it would take to ‘fix things’” (Cook 8).

### *Recommendations*

1. That any ‘greening’ activities completed in the Environmental Studies 2 building (ES2) have accompanying educational materials.
2. That a framework for environmental education be included in any proposed ‘green’ activities in ES2.
3. That all ‘green’ initiatives be displayed and explained in said framework.
4. That in the interim between framework implementation and ‘green’ project implementation, student work and/or relevant environmental information be displayed.
5. That WATgreen manage the educational displays, including content, through a method that
6. That Stairs One in the Environmental Studies 2 building (ES2) be regarded as the beginning of the framework tour.

7. That the information presented in the Stairs One component of the tour include information on the programs offered in the Faculty of Environmental Studies, information on local or current environmental events, and information on general ecological processes.
8. That the information presented in the framework be maintained and reviewed regularly.

### *Future Studies*

In future studies examining educational opportunities on the University of Waterloo campus, there are several ideas that we feel are vital to explore:

1. The City of Waterloo may have by-laws or fire codes that may restrict the extent of a self guided tour throughout ES2, or may restrict the type of display or materials used to create a display.
2. An in-depth look as to what to include within the displays and along the information boards of the proposed self guided tour should be determined
3. Examining how the proposed self guided tour may be embedded within the curriculum of local educational systems would extend the usefulness of this proposed project.
4. Examining the feasibility of implementing similar environmental education displays throughout other buildings within different faculties of the University of Waterloo.

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## Appendix A

### Suggested Readings

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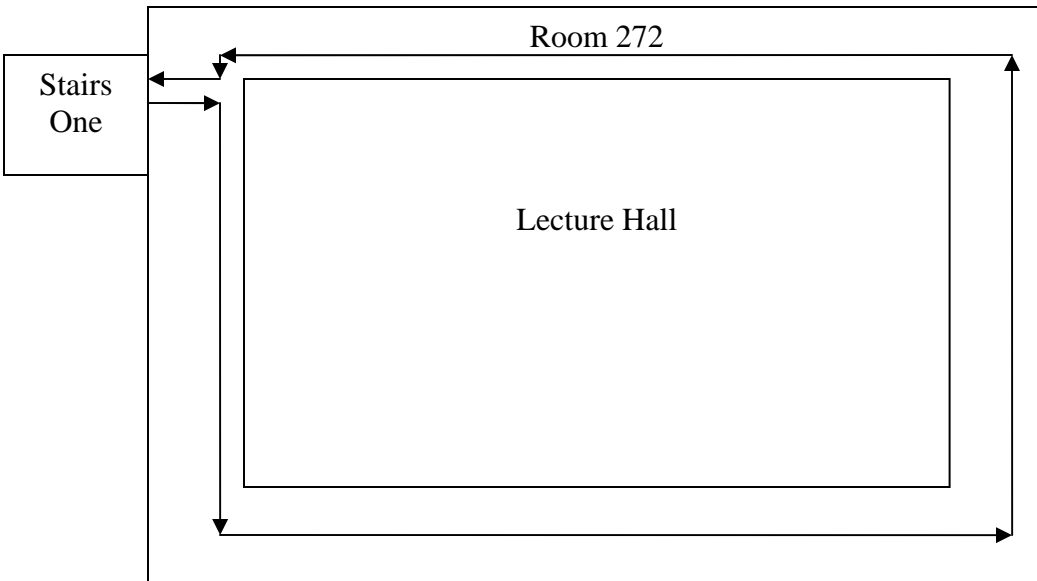
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## Appendix B

### Map of Tour Route



# Appendix C

## Stairs One Proposed Design

