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The Double-Edged Sword: Critical Reflections on Traditional and Modern Technology in Outdoor Education

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Abstract

The outdoor education experience continues to be influenced by a proliferation of modern technological innovations, most of which have been accepted and even embraced by educators with little inquiry. Seldom do instructors of outdoor programmes consider the impact that modern techniques and equipment can have upon students' learning. This paper argues that in an unexamined adoption of this technology, some of the potential positive impacts for participants can be compromised, including a direct and meaningful connection to the natural world. As such, modern technology has become a possible mediating influence for participants in outdoor education programmes. The paper examines some of the pedagogical issues of modern technology as a mediator of experience as well as several elements of educating in the outdoors with traditional technology. Woven into the discussion is the question of whether modern technology encourages more people to become involved in outdoor activities or merely works toward the separation of humans from the rest of nature.

Introduction

Technology is a mediator of our experiences (Borgmann, 1984; Ihde, 1993; Verene, 1997; Wattchow, 2001). Among others, Schutz (1962) developed and elaborated on the notion that reality is socially constructed, and that in being so, we operate on a number of unexamined assumptions about social behaviour and phenomena. As a significant element of everyday life in modern societies, technology plays an important role in the development and maintenance of cultures. This can most easily be seen in Western cultures' adoption of communications technologies (e.g., cellular phones, televisions and personal computers), but entire economies as well as modern warfare have been, and continue to be, changed by technological development. Indeed, technology has reached the point of reinforcing its own advancement (Strong, 1995), thus strengthening the acceptance of its associated values: rationality, efficiency and convenience. In this way, technology, while seeming to be only a tool of humanity, actually influences social values and practices, becoming part of the cultural filters through which we each interpret reality.

To say that technology is neither good nor evil may invoke a range of reactions from both its proponents and critics. It can be rightfully praised for its contribution to higher living standards (for some), extended life expectancy and liberation from excess drudgery and toil, collectively known from the human perspective as "progress". Conversely, a legitimate condemnation can be levelled at technology for exaggerated social inequities, increased rate and efficiency of ecological destruction and a decrease in life's authentic quality. There are degrees of truth to all of these claims, a recognition which might lead one to conclude that technology is neutral and that its quality of

being good or evil depends upon one's perspective or upon the morality of the people engaging a particular technology. However, the acceptance of such an assertion attempts to divorce humans from our creations, and too easily reduces the complex relationships among and between humans, technology and other life, to a point at which no acceptable argument may be made for or against specific technologies as long as some benefit may be seen flowing from its practice.

Under such a relativistic paradigm, technology is given free reign in its development and the consequences of its application are relegated either to the level of personal and social unconsciousness, or at most, to academic debate. While it would not be fair to state that there are no real actions taken which attempt to shape technological innovation (e.g., legislation on human cloning), it would likely be accurate to say that technology is largely welcomed by most people. In addition, the implications of incorporating technologically enhanced consumer goods are generally taken for granted. In fact, it could not be otherwise. To attempt to be constantly aware of the layers of consequences of technology in modern society on individuals and on culture would indeed be mind-bending. Very few people fully understand the technologies they use. We are more likely to be thankful for the reliability of central heating (or air conditioning), the convenience of grocery stores or the accessibility of computerized banking machines than to be mindful of the infrastructure needed for the successful operation of these developments. Dwelling on the intricacies of how exactly one's life might be different in their absence is simply not a matter of everyday reflection.

In the field of education, few change issues are more persuasive than the introduction of new technologies (Bigum & Kenway, 2001); the same is true for outdoor education. In outdoor education, the use of technology has tended to fit into the aforementioned seemingly non-controversial type of engagement. Two of the major goals of outdoor education have been to counterbalance the effects of modern urban lifestyles (Neill, 2001) and encourage its participants to connect with the rest of nature (Van Matre, 1983). One of the most effective methods of helping people to discover this connection has been to take them into places where ecological processes function more freely than the human dominated landscape (Faarlund, 1993; Gelter, 2000). Various called "the environment", "wilderness", "nature" and "free-nature", these places, where life is not dominated quite so forcefully by human-dedicated landscapes, are highly valued among educators in the outdoor field for their capacity to re-establish and reaffirm our affinity with, and commitment to, other life. Existing for brief or extended periods in natural settings involves clothing and equipment suited to outdoor living. With the explosive increase in outdoor travel in Western societies during the past few decades (see Villemare, 2000), there has been a corresponding technological explosion surrounding the equipment and clothing that accompanies these forays to free-nature, as is evidenced by the expansion of the outdoor retail market. It is not our intent to address modern technologically driven simulated experiences that take place outside of the natural environment such as artificial climbing walls, indoor skiing ramps or virtual reality adventures. Instead this paper focuses on the participation in activities that take place in relatively free-nature.

This paper refers to "traditional" and "modern" technology in outdoor education and proposes that there are differences in how each affects the experience of participants. A short explanation of our use of these terms is necessary as we recognize the problem of trying to draw a sharp distinction between what is modern and what is traditional. Because of the flexibility of the word technology itself, rigid definitions may not be entirely useful since exceptions to those definitions are inevitable. In short, it is not our intention to become bogged down in the semantics of "how natural is natural?" in stating, for example, that traditional technologies are made with natural

materials. Instead, we offer some direction for an understanding of these terms as larger concepts. In delineating among various lower technology approaches, Clifford (2003) proposes the following description of traditional:

In general, the traditional skills enthusiasts and programmes practice days-gone-by methods of camping... They also advocate using equipment and gear made from natural materials where possible. For example, wooden snowshoes would be preferred over modern synthetic ones and clothing would usually include the use of wool, leather and cotton (p. 27).

In attempting to connect the pedagogy of experiential education to the moral philosophy of deep ecology, Horwood (1991) identifies five principles (place, wholeness, identity, integrity and wildness). Of those principles, Horwood maintains that "wildness comprehends all the others" (p. 26). A central component of this principle is in its suggested relationship for humans and the rest of nature:

The primitive quality of wildness also provides for simplicity in everyday acts and materials. Bannock baked on a stick is wilder than when baked on a reflector oven. Labrador tea is much wilder than instant coffee. This is not to oppose technology, but rather to choose, always, those techniques which are simplest and most direct (p. 26).

For Clifford (2003) and Horwood (1991), there is a feeling that accompanies the traditional that may be enhanced by using certain materials or techniques, but cannot be completely expressed in relation to physical properties. Among others, MacEachern (2000) also speaks to this aesthetic sense.

Additionally, despite the temptation to tie modern and traditional to points—or even eras—in human history, we prefer not to think of these terms strictly in relation to a timeline, even though there are undeniable historical elements. Rather, we tend to understand traditional technology for the outdoors as that which helps the user of the technology to establish a certain mind set or a state of being. A traditional approach, then, while not opposing modern technology, sees technology as problematic and in need of sober second thought. For our purposes, traditional technologies are those pieces of equipment that most effectively allow practitioners to access the simplicity of living and travelling in the outdoors, while at the same time seeking to responsibly reduce the number of filters through which we experience free-nature.

Modern technology, on the other hand, often aids practitioners in reaching newer accomplishments that might not otherwise be realized without that technology. Also, as we shall see in the example of climbing ropes, modern technology has increased the safety of some outdoor activities; however, although these two characteristics often accompany newer outdoor technologies, they are not required nor fundamental to understanding what makes a particular piece of equipment modern. Simply put, modern outdoor technology seeks *a priori* to increase efficiency and ease for its users.

Technological developments have been overwhelmingly and largely unproblematically adopted into outdoor education cultures, in part because these developments have made it easier and more comfortable to be outside. With many programme goals being organized by the need to be *in* nature, technologies which have made it easier and more comfortable to live and travel in nature have understandably been seen as positive. This favourable outlook can be seen in the wholesale adoption of new technologies by outdoor programmes and outfitters in the adventure industry. However, quite recently the manner and style of being in nature has come to be more widely questioned by some practitioners and educators. Tenner (1996) makes the argument that technology in outdoor

settings, even if its design is for increased safety, may have what he calls the “revenge effect”. In other words, according to Tenner, as a result of employing certain technologies, the opposite of the intended effect may actually occur. One well known example is the increase in paper use in modern offices as a direct result of the introduction of computers, despite the original claim of their potential contribution to a “paperless” work place. An example in an outdoor context could include the reliance on a satellite phone that ultimately fails to provide critical communication for a food drop or pick up. A broader and more profound example for the outdoor education field is that modern technology, in attempting to increase participation in the outdoors by making free–nature more accessible and more comfortable to be in, has also had the unintended, antithetical effect of insulating people further from natural processes, both in terms of direct experience and in acknowledging their own impacts. At this point we turn to examine some of the more evident impacts of technology on the human relationship with the rest of nature in the outdoor cultures of Western societies.

Impacts of Technology on Outdoor Experience

What it means to be outdoors has changed significantly in the past few decades. Until the outdoor related equipment technology boom of the 1970’s, 80’s and 90’s, the techniques of axe and saw use, fire lighting and other traditional skills were foundational in outdoor education and considered necessary knowledge to living and travelling comfortably in nature. For example, the increase in popularity of the Leave No Trace camping ethic has, for many programmes, replaced cooking over fires to cooking with camp stoves, in some cases eliminating the “need” to learn such traditional skills. Currently in North America, wilderness travel more often means lightweight stoves burning refined naphtha fuel, multi–piece nylon tents with graphite or flexible aluminium alloy poles, self-inflating sleeping mattresses, shock absorbent hiking poles, and perhaps a relatively small penknife. Clothing textiles now include polyester and polypropylene underwear, referred to as “hydrophobic”. Today, body warmth is retained by synthetic “fleece” while rain and wind are avoided by vibrantly colourful garments made with Gore–Tex®, a gaseously permeable membrane that manufacturers claim keeps the rain out while allowing water vapour to escape. Plastic boots with removable synthetic liners are rapidly becoming the norm for a variety of outdoor activities while waterproof or heat reflecting socks have also become quite popular. Suffice to say that it may be difficult to find a single item of clothing made of natural fibres in the backpack of a modern outdoor enthusiast.

On the surface, the adoption of these items into outdoor culture may seem benign; after all, they are merely tools that make wilderness living and travelling easier and safer. It could also be argued that developments and contributions of technology can enhance enjoyment of the outdoors, by, for example, allowing participants to travel in harsher conditions, be “out” for longer periods of time than in the past and have the capacity to quickly and accurately determine their location. While this is perhaps partly true, there are some unexamined implications of these changes. First, and perhaps most damaging, is that most technology like this is produced outside of any real involvement of the user (Wattchow, 2001), meaning that the piece of equipment is not generally understood by them. The vast majority of items in use today are not engineered to be easily repairable in the field, removing the outdoor participant from its value except in monetary terms for replacement, maintenance or repair by equipment technicians generally located in urban centres. This emphasis on monetary exchange as a means to participate in outdoor activities has an underlying significance, namely that the experience as a whole becomes more commodified (see Ewert & Shultis, 1999; Loynes, 1998; Watson & Kopachevsky, 1994; Wearing & Wearing, 1992).

Outdoor clothing has more recently become fashionable with the mainstream population, further subsuming subcultures that once saw their identities as alternative. In addition, those within outdoor subcultures now experience considerable pressure to possess the latest technological innovations as older technology is seen to be inferior. As a result, one unstated message is that possessing high-technology gear and clothing is a prerequisite for participation. According to Johnston and Edwards (1994, p. 464) the commodifying processes have served to “put more people in the mountains, many of them perhaps better equipped than experienced...”

Accompanying the commodification of outdoor experiences is the heightened profile of risk and liability in outdoor experiences. The need to be “adequately” insured and/or the fear and misunderstanding of liability has meant the closure of some outdoor educational programmes, even while adventure tourism itself has flourished. The management of risk for many professionals has rapidly evolved to include radios, cellular or satellite telephones as standard items on wilderness based trips. The inclusion of these high-technology communication devices is predicated on the need for rapid intervention in the event of a medical emergency, and there is no doubt that the ability to call for help from the “outside world” has benefited some who would otherwise have suffered much worse and/or for much longer. However, high-technology risk and crisis management are accompanied by changes in the perceptions of those engaged in wilderness experiences. Some evidence suggests, for example, that the seriousness of certain undertakings in the out-of-doors is not given their due. Krakauer (1998) raises the concern that many who now venture to the wilderness seek adventure without danger, seeing the possibility of rescue more as a guarantee of safety than as a backup plan. While it is not our intention to argue against the advantages of rescue in dire circumstances, the present push towards the high-technology standard of care that is becoming entrenched in the industry and possibly in the courts deserves some reflection on what this evolution might hold for developing a direct and meaningful sense of being in free-nature. How a society, or even a sub-culture, engages the natural world carries with it default messages for how its citizens and participants should develop their collective ethic of that world.

In an analysis of trekking in the book *Crazy Mountains*, Strong (1995, p. 93) concludes that technology “insulates one from the conditions of the place, smoothing out even the forbidding ruggedness of the Crazies, narrowing ones [*sic*] contact with them, and making wilderness an easily consumable package.” So, if one of the goals of outdoor education is to connect with nature and the rest of life, the technology filter which adds membranous layers to our direct encounter with the natural world has the potential to work against the actual goal of the outdoor education programme.

Outdoor Education Pedagogy

It is in this context that the pedagogy of outdoor education becomes critical. With students’ expectations being partly shaped by the outdoor culture in which they learn, and with pedagogical requirements for preparing outdoor professionals continuing to mediate those students’ training through increasingly technological experiences in nature, one must ask where the balance lies for a responsible use of technology in a field that attempts to encourage profound connections with nature. In beginning to answer this question, the perspective taken by Paulo Freire can be instructive. Shor and Freire (1987) develop the notion of a critical pedagogy which seeks to teach to students’ needs while at the same time raising questions that critique one’s own discipline. Shor and Freire (1987) maintain that raising students’ consciousness to the problematic issues during their education has

the potential to begin a shift in the culture that drives the embedded and unquestioned practices of one's discipline. This critical approach to outdoor education has the advantage of exposing the issues raised above concerning technology and the outdoors. Specifically, engaging in outdoor living and travel with more traditional equipment as part of a more balanced critical pedagogy in the outdoors has the potential to profoundly benefit students' experiences with nature. Certainly one of the benefits of outdoor education is that it can positively disrupt the human constructs and artifacts of people's everyday urban lives and encourage them to relate to the land through daily living (e.g., fire lighting) and crafting (e.g., making snowshoes). These skills can require rudimentary tools (flint and steel and knives) and related skills to which students are generally not accustomed. The learning and practice of these skills can foster a greater understanding for science and history through the requirement of a more direct relationship with the technology involved. As well, critical intra-personal and inter-personal skills—so important to the foundations and goals of outdoor education—can be enhanced through those skills which are inherently community oriented or which re-focus experiential attention to the more temporally and spatially immediate. A discussion of the above advantages, and the lessons associated with experiences that embrace traditional technology in outdoor education follows.

At the outset we wish to recognize the importance of the Leave No Trace camping philosophy and its appropriate practices in many areas. However, it should also be acknowledged that if the traditional skills practiced in the natural areas visited by programme participants are indeed sustainable for those areas, then the use of traditional methods for educational purposes may be totally appropriate for that area. For example, in some natural areas the use of refined fuels and manufactured stoves may have a greater ecological impact from a global perspective than traditional methods as a result of the embodied energy required in their production and distribution. So, while leaving no trace in the wilderness may reduce local impact, the less immediately visible, but equally important global impacts also deserve consideration.

We also wish to acknowledge the benefits that modern technology brings to education in the out-of-doors. Plastic canoes and kayaks can take paddlers to places where cedar and canvas covered ones cannot; modern synthetic climbing ropes with their dynamic properties are safer than their predecessors; and garments made of fleece are lighter and dry more quickly than those made of wool. Each and every learning environment and intended learning experience should influence instructors' decisions on how best to meld more traditional technology with modern technology. The point we are attempting to address here is that outdoor educators should question why, where, if and how they might balance the use of the generations of technology. The importance and the implications of making conscious choices of the technology used are paramount, for these choices can profoundly affect students' experiences.

Attachment to Place

There is empirical evidence to suggest that the increasing use of modern technology in outdoor recreation diminishes humans' emotional attachments to the natural environment (Shultis, 2002). Conover and Conover (1995, p. 101) write that "A camper who relies on a little technology and a lot of technique has a deeper understanding of the wilderness and real living skills" than one who is more dependent on modern technology. A core component of traditional technology used in the outdoors is simplicity, which by its very nature and design necessitates an engagement with the land. The collection, manipulation and use of natural materials (e.g., for crafting, consumption and cooking with fire) fosters the use of multiple senses and can increase a student's knowledge of a

local bio-region. This engagement and interaction encourages a sense of reciprocity with nature and can ultimately form a deep relationship with the land (MacEachern, 2000). In making a wooden spoon, observation, diligence, care and patience are necessary to seek appropriate wood, to work with its grain and individual features to effectively and safely carve its shape, and to finally hollow out a depression in one end with hot embers. Furthermore, the utilization of a self-crafted spoon is likely more rewarding and meaningful for a student than its mass produced, plastic counterpart. Other than its functional capabilities the commercially manufactured spoon has little meaning and is easily replaceable. Conversely, the handcrafted spoon can come to represent a meaningful personal journey and serve as a powerful symbol to facilitate a timeless transfer of the learning and growth experienced outdoors.

The bonding to nature through the use of traditional technology can also facilitate a more deeply felt understanding of the life and death process from which modern society tends to alienate us. For instance, collecting wood for fires may give pause for reflection on how much life forms and ecosystems can bear before their vitality is seriously lessened. Death in some form is a necessary part of sustaining life, and to observe this directly (e.g., catching fish for dinner) can be a profound tool, not only for understanding the interdependence of life and death, but for developing a deeper respect for the lives we must end or alter in sustaining ourselves. With modern technology (e.g., cooking with stoves) we seldom experience the natural world in the same way that was once commonplace (Bartle, 2000). How can we come to know the environment with the depth of our predecessors when we insulate ourselves from it through modern technology?

Connection to Storied Landscapes

The places to which students travel for outdoor education are frequently rich in cultural history. In Canada, for example, most of the places visited by outdoor programmes have had a human presence for hundreds of years, whether it is First Nations Peoples, European explorers or fur traders (Dyment, Watson & Kuiper, 2002). Traditional equipment and methods used in outdoor education can help foster a deep knowing and appreciation for the discovery of historically storied landscapes (a place full of interesting history and connection with culture) and for the skill and knowledge of traditional cultures (Henderson, 2003). The active use of traditional outdoor living equipment can help to make the stories of dwelling, travel, discovery, exploration and settlement that students come to learn “on trip” come alive (see Elrick, 2003). With traditional clothing and tools outdoor educators can tap the imaginative spirit of adventure with the land and give students the opportunity to actively re-live the past and come to know and understand it with their own toil and sweat (Henderson & Potter, 2001). For example, having studied period history including fur traders’ journals, dressed in period costume and using traditional tools, students in a Canadian university outdoor recreation programme vividly re-create and meaningfully re-experience the stories of their past through a two week voyageur canoe trip that re-traces some of the footsteps of Canada’s fur traders of centuries past. As the students travel with one eye to the past and one in the present they learn the stories and experiences that come to complement their own. Experiences such as singing period songs, cooking over open fires, practising celestial navigation and paddling in, sleeping under and portaging their 36 foot replica canoe attempt to capture a place in time where the bondage of linear time is severed – or at least blurred – thus exposing the stories, culture and associated values through a meaningful lived-experience.

Development of Fundamental Wilderness Skills.

The philosopher—forester Aldo Leopold once stated that the person who cuts his or her own firewood is warmed twice (Leopold, 1966). He also warned that a life of too much convenience could lead one to think that food comes from a grocery store and that heat comes from a furnace (Leopold, 1966). Since the advent of natural gas, oil and electric central heating, more than a generation of people in North America has grown up validating Leopold's fears. In *Why Things Bite Back: Technology and the Revenge of Unintended Consequences*, Tenner (1996) argues that more efficient and user friendly technology of today seems to be taking much of the fear out of some forms of outdoor activities (e.g., climbing, canoe tripping, backcountry hiking and skiing). Modern technology makes wilderness areas more accessible and provides a greater perception of safety than ever before (Ewert & Shultis, 1999). The revenge effect is that participants often develop an illusion of control, feel an immunity from natural events and tend to overestimate safety and the predictability of nature. Consequently, many participants of outdoor activities consider modern technology a substitute for skill and knowledge (Ewert & Shultis, 1999). The incentive for them to develop fundamental wilderness skills¹ is vastly reduced, therefore they often take risks without realizing their seriousness (Tenner, 1996). As an example, this illusion of control can create an over-reliance on modern technology that can be hazardous in the event that the "working" technology fails (e.g., batteries fail on a global positioning system unit and the participant has little working knowledge of a compass).

Understanding of Science.

Traditional tools used in outdoor education act as catalysts to meld theory and practice and bridge gaps in understanding science that is often further separated by modern technology. Fundamentally simplistic in design and function, many traditional tools require knowledge of scientific principles and considerable skill to utilise. For example, prior to the advent of satellites, a sextant used in celestial navigation was a standard tool used to determine geographic position. The use of a sextant requires knowledge of astronomy and mathematics and can only be used under sufficiently clear skies. In conjunction with a magnetic compass, which also requires an understanding of spatial concepts, the sextant can provide precise information required for directional travel. However, the accuracy of these tools is totally dependent upon the user's skill. The sextant's and compass' present day counterpart, the global positioning system (GPS), can, among other functions, within seconds locate geographic position, indicate direction of travel and calculate distance of travel. While the speed and accuracy of GPS is impressive and its benefits are undeniable, its user requires scant knowledge of physical science in order to use it, and virtually no knowledge of, and connection to, the natural world is necessary.

Another example of traditional technology's melding of theory and practise can be found in starting a fire using a bow-drill or flint and steel, where students must understand the theory of combustion and become skilled in the practice of capturing a spark and moving it through the necessary stages required to build a camp fire. Creating a spark and nurturing its growth to a campfire requires the knowledge of the combustible abilities of various materials as well as optimal oxygen supply. An understanding of what makes a particular material superior for capturing a spark and what materials

¹ Fundamental wilderness skills are basic rudimentary 'survival' type skills (e.g., navigation using a map, compass and/or the sun, camp-craft and shelter building using natural materials) that are essential for safe wilderness travel in absence of modern technological tools.

and densities are best for nurturing each stage of fire building is also critical. Here scientific principles of physics and chemistry must be applied for success. Cooking over an open fire, as opposed to a stove, extends this learning where students can experience and learn how to appropriately select and harvest fuel, conserve fuel, regulate heat and come to appreciate the benefits and drawbacks of various cooking methods and wood types. Conversely, more modern methods of lighting fires with butane lighters or matches and cooking with gas stoves pass over the most technical steps of the fire making and maintaining processes, and thus allow students to ignore fundamental principles and skills.

Personal Growth.

Modern technology is continually designed to increase efficiency, accuracy and ease of use. In many cases modern technology requires less skill and time from users to perform its intended function than traditional equipment. As such, the use of traditional tools over modern technology in outdoor education can result in a heightened degree of difficulty, smaller margin for error, greater work, decreased efficiency and, subsequently, delayed gratification for students. All of this can initially contribute to frustrations and perceived failures by students; however, properly sequenced by the teacher and with time and patience, eventual success can lead to profound learning opportunities. For example, the incorrect usage of a sextant and/or compass may result in students temporarily losing their way. Driving rain will certainly increase the challenge of lighting a fire and could result in a late or cold dinner. Similarly, sleeping under a poorly designed, self-constructed shelter may prove drafty and wet. However, learning how to perform fundamental outdoor skills with success can lead to much personal growth (Potter, 1993); accepting appropriate challenges, meeting those challenges and acknowledging resultant changes in self and group is a classic tenet of many outdoor education experiences (Raiola & O'Keefe, 1999). Modern technology, while perhaps more comfortable and convenient, can starve its users of the satisfaction of a task well performed. The lightweight stove may help to achieve a faster mug of hot chocolate on a cold rainy day; a tent may feel more secure in a storm, but, the learning and self-confidence that may be realised through more challenging tasks such as lighting and cooking over a fire and erecting a self-constructed shelter are subsequently lost. Simply put, in some outdoor education contexts, convenience, efficiency and security can counter intended learning (Henderson, 2003; Wattchow, 2001).

It can be argued that the ease and speed of modern technology, such as the accurate and speedy GPS, can allow people to concentrate on being "with" nature and, consequently, their relationship with the natural environment can be heightened through the use of time saving tools. We argue that this depends on the immediate and long-term goals and constraints of the programme. Instructors should ask themselves if the inclusion of another human-dominated layer, mediating our relationship with nature, is compatible with (i.e., is enhancing) programme goals, is necessary for issues of safety and/or time, or is unnecessary and detracting from what they see to be at the heart of students' experiences.

It is clear that traditional forms of technology used in outdoor education are generally more basic, less efficient and less convenient than their modern successors. The qualities of modern technologies, by their nature and design, usually require less physical, cognitive and emotional engagement from their users, thus diminishing the experience of performing a specific task with them. While efficiency and convenience have virtue, there are serious flaws in employing practises that are dominated by those values. Proponents of this approach can miss the opportunity that "an experience of a thing is always and also a bodily and social engagement with that thing's world" (Borgmann, 1984, cited

in Strong, 1995, p. 81). Therefore, a campfire can be used to furnish far more than just physical warmth. It provides a physical, emotional and social engagement with the natural world: the smell of wood smoke, the exertion of chopping, sawing and carrying, and the teaching of skills. Hence, accomplishing traditional skills, such as building and maintaining a fire for a group, can offer meaningful opportunities for teamwork, sharing and interpersonal growth.

Social Inclusion.

In an era in which government expenditures for public education is declining (Kenway, Bigum, Fitzclarence, Collier & Tragenza, 1995) programmes that offer more traditional experiences also benefit from reduced expenses in their operation, as traditional equipment is most often less expensive to purchase and maintain than modern technology. The shift to the use of an increasing number of modern technologies in outdoor education has probably made the field expensive, highly exclusive and homogenous, and limited to those who can afford it; consequently, the field is dominated by the middle and upper class (Newbery, 2003). A curriculum that balances both traditional and modern technology can initiate a shift away from social exclusivity and make the field more accessible, more diverse and more socially just (Warren, 1998).

Conclusion

It needs to be stated unequivocally that we are not advocating an abandonment of modern technology in outdoor programmes. However, we do believe that it is not accurate to assume that a primary goal of outdoor education, encouraging a connection to free-nature, is being met adequately merely by physically placing students in natural landscapes. It is necessary for outdoor educators to realize that whether the equipment we use be traditional, modern or a mixture of both, each will convey unique underlying messages to participants and will have implications for student learning.

It is our position that as educators we should consciously reflect on our pedagogical practises so as to assess their compatibility with programme goals. If a technologically mediated nature is all we come to know, we risk eroding direct, meaningful engagement with nature, the very essence of natural experiences we so eagerly seek for our students (Wattchow, 2001). According to Conover and Conover (1995, p. 160) "without engagement, there can be no lasting relationship." In becoming too reliant on modern technology, we miss some of the profound understandings gained from a physical dependence on, and engagement with, the land. As Bigum and Kenway (2001) purport, we need to step outside of our institutional culture and see it "against the grain" (p. 389). In so doing we can better question the plethora of unquestioned assumptions regarding modern technology that have so recently become rooted in outdoor education.

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