Educational Geotrekking

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INTRODUCTION

Geocaching is a civilized treasure-hunting activity enjoyed by hundreds of thousands of people all over the world. Geotrekking takes geocaching to the next level. It expands the educational potential of geocaching by combining this enjoyable physical and mental activity with the purposeful examination of multiple geocaches (traditional, virtual, or online through Google Earth ™) designed and/or collected to provide clues, resources, and scaffolding to support learners as they work on a larger problem-based learning (PBL) challenge or set of challenges. It is expected that engaging students with this type of authentic PBL activity will support improvements in student attitudes towards the related subjects along with increased engagement and learning (e.g., Baker & White, 2003).

Geotrekking can also be seen as an instructional design model supporting the creation of engaging learning opportunities and promoting the integrated development of geographical, mathematical, cultural, scientific, and other literacies. By interweaving meaningful problem-based learning challenges (Jonassen & Rohrer-Murphy, 1999; Kolodner et al., 2003) with appropriate authentic and contrived learning resources (scaffolding) and by addressing multiple learning modalities (e.g., visual, aural, kinesthetic) teachers can add useful variety to an educational program thus meeting a broader range of student needs. Challenging students to design, implement, and test geotreks as an activity to teach prior learning goals and to support their current learning goals may have additional educational benefits (i.e., learning by writing and learning by teaching) (Resnick, 2002).

This paper begins by describing geocaching, the common types of caches, and the protocols used within the geocaching community. With this background information, the nature of geotrekking is discussed and the educational potentials of three types of geotreks are examined: portable, fixed-location, and online (Google Earth™). Finally a Web site, geotrekking.net, is described as one possible resource to support the sharing of geotreks within the educational community.

GEOCACHING

Geocaching is a modern-day treasure-hunting activity that engages participants of all ages with a broad range of recreational goals including physical activity, mental challenges, learning opportunities, shared experiences, and solitude (Chavez, Schneider, & Powell, 2004; Hauser, 2003; Lary, 2004). The distinguishing feature of geocaching when compared to other hide-and-seek types of activities (e.g., letterboxing, orienteering, etc.) is the use of GPS (global positioning system) and GPS devices to locate a place according to latitude/longitude (Lat/Lon) coordinates (Stern, 2004).

The first geocache was set in Washington State in May 2000, shortly after the U.S. government discontinued its intentional degradation of GPS signals. By September that year, a Web site was set up to support this new hobby. Geocaching.com appears to be the most popular online resource center for the rapidly growing geocaching community (Groundspeak, 2006a). It provides a system to create, maintain, and archive caches as well as a communication forum to support a worldwide geocaching community. In June 2006, there were more than 280,000 active caches located around the globe. Collectively members enter tens of thousands of geocaching experiences each day (e.g., more than 180,000 entries in 7 days in June 2006) describing what they found, telling about the experiences that they had locating a cache, or sharing other relevant information.

A typical geocache is presented with a descriptive name, a Lat/Lon location (which may either be the location of the cache or a nearby starting point) and a

description of the cache plus some clues for finding it. Additional hints may also be provided in an obscured format such as ROT13 (a commonly used simple cipher) to limit unintentional review of hints (Von Rospach & Spafford, 1993) and through comments left by previous visitors (plain or in ROT13). New public caches are set up according to a set of common-sense rules (e.g., not too close to another cache, with permission of the property owner, near a trail, not buried, waterproof, etc.) and maintained by an "owner" (a person or group with membership in the geocaching.com community). Caches may be as small as a film canister or magnetic key holder or as big as an old ammo box. They usually contain a log book for recording visits and trinkets or other exchangeable items (treasure!).

Geocachers follow a common sense protocol when searching for caches (no trespassing, stay on the trail as much as is practical, avoid disclosing the cache location to non-participants (aka geo-muggles), log your visits, etc.). If a prize has been left in the cache for a particular visitor (e.g., first-to-find, tenth-to-find, etc.), then the honor system applies and the appropriate finder takes the prize, otherwise participants are encouraged to exchange some object that they may have brought for something of similar value in the cache. For many geocachers, the thrill is in the hunt and a common log report is that they "took nothing and left nothing" (TNLN). Finally, geocachers log their exploits on the geocaching.com Web site—reporting any interesting events or maintenance issues.

There are various enrichments to the standard geocaching process that have been designed to enhance the activity for the participants or the community. Geocaches may occasionally contain other objects such as travel bugs—registered objects which have been set loose within the geocaching system to be picked up, logged, and transferred to other geocache. This allows owners and other participants to track the progress of the travel bug. Another enrichment to the hobby is the Cache in Trash Out (CITO) program—either as a formal event or informal practice. Here participants are encouraged to pick up litter they find on their geocaching activities as a gesture of goodwill and a contribution to the community.

Finally, another type of geocache is the virtual geocache. With virtual geocaches, the participants seek for a location of interest or some special feature found at a location and may retrieve some information from it. Once the virtual cache is located, any required information is noted and reported back to the cache owner for confirmation. To separate these non-cache locations from true caches (and to clarify the nature of the respective activities), the developers of geocaching.com closed the site to virtual caches in 2005 and opened a new site called waymarking.com to support the sharing of locations and descriptions when there is no container (Groundspeak, 2006b). Although there is no physical logbook to sign, a record is maintained on the waymarking.com Web site where participants can log their visit and review the successes, experiences, and observations of others. This type of cache can be designed with minimal impact and is often a better choice when the site is particularly sensitive to damage or when too many geo-muggles are typically present to allow a cache to be hidden and retrieved effectively.

GEOTREKKING

Geotrekking synergistically combines the engagement associated with the physical activity and problem solving aspects of geocaching, the satisfaction associated with successfully addressing a meaningful challenge, and the learning associated with authentic expansion of various literacies including:

- **Geographical Literacy:** Understanding the "where" and the "why there" issues with respect to the earth and its natural and cultural features.
- **Mathematical Literacy:** The ability to deal with the quantitative aspects of life, the ability to evaluate and accept or reject mathematical statements of others, and the skills and foundational concepts to support effective reasoning and problem solving.
- **Cultural Literacy:** The ability to converse fluently in the idioms, allusions, and informal content which creates and constitutes a dominant culture.
- **Technological Literacy:** Knowledge about, and ability to apply, technology in everyday life.
- **Scientific Literacy:** Dispositions, skills, and knowledge that support learning, problem solving, and communicating with respect to the world around us.

A geotrekking activity will typically include an