EXPLORING THE EFFECTS OF GEOCACHING ON UNDERSTANDING NATURAL RESOURCES AND HISTORY

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Abstract
Since 2000, geocaching has been enjoyed by enthusiasts who wish to combine technology with a love for the outdoors. The purpose of this exploratory study was to examine if geocaching can contribute to a participant's understanding of natural resources and history. To comprehend these effects, a study was conducted at Minnesota's Wild River State Park in the summer of 2010. Four volunteer participants were recruited for in-depth interviews and qualitative inquiry was employed to learn about their geocaching experience and collect their responses. Inductive content analysis was used to analyze the interview data and identify possible geocaching effects based on participants' perceptions. Six main categories were identified including learning, enjoyment, new attractions, constraints, economic benefits, and damage to the environment. Findings suggest that participants believed that their knowledge of park history and natural resources increased through geocaching. Recommendations, based on the findings, were given to park managers and the Minnesota DNR.

1.0 Introduction

Geocaching is an activity that forges a connection between nature and modern technology through the use of Global Positioning Systems (GPS). GPS receivers and satellite data direct participants to latitude and longitude coordinates. People who participate in geocaching ("geocachers") can find a geocache box when they arrive at the latitude and longitude coordinates. Geocaching has become one of the fastest growing outdoor activities in Minnesota's state parks (Minnesota Department of Natural Resources and Citizens League 2010). According to Harmon (2008), participation in outdoor recreation declined over the past ten years and geocaching may boost outdoor recreation participation in the modern era. Geocaching can make outdoor activities, such as walking, more enjoyable (O'Hara 2008) and participants may discover new areas of the state and increase their visits to parks (O'Hara 2008, Schneider & Chavez in press). The use of GPS may also help develop a sense of place concerning the natural environment (Messick 2009). Furthermore, since the path to finding a cache can take participants through interpretive centers, park museums, and guided trails, geocaching can help participants learn about the natural resources and history of the land being explored.

The purpose of this exploratory study was to examine participants' geocaching experiences and study geocaching's potential to help participants learn about the natural resources and history of an area. Our research hypothesis was that those who participated in geocaching would develop an increased understanding of park history and natural resources through self-guided interpretation.

2.0 Methods

Data was collected on-site from geocachers visiting Wild River State Park (WRSP) in the summer of 2010. WRSP, situated along 18 miles of the St. Croix River about 55 miles northeast of St. Paul, Minnesota, was chosen for its high level of involvement in geocaching and its wide range of historic, cultural, and natural resources. Park naturalists had designed WRSP geocaches to highlight the area's history, flora, and fauna, and required participants to solve puzzles and clues in order to find the caches.

Experience in geocaching was required for this study and participants were recruited via purposive sampling. Potential participants were approached as they entered the park's visitor center and asked to participate in the study. Qualitative inquiry was used to collect information from participants about their geocaching experience via in-depth, semi-structured interviews. These methods allowed researchers to understand the meaning of an event for participants and were appropriate for exploring attitudes, behaviors and experiences (Maxwell 2005). Each tape-recorded interview took place outside the park's visitor center and lasted from 30 minutes to one hour.

Inductive content analysis was used to examine words and phrases within each interview transcription and a concept map was drawn based on findings. Data interpretation was accomplished through coding and identification of emerging themes (Babbie 2001, Hsieh & Shannon 2005, Zhang & Wildemuth 2009). Intercoder reliability was employed to increase the consistency of the coding structures (Kurasaki 2000). The Cohen kappa coefficient was 0.709, which was an acceptable level (Fleiss 1981).

2.1 Profile of Participants

Four geocachers agreed to participate in an in-depth interview. Participants were all experienced geocachers from Minnesota who owned a handheld GPS unit. Interviewee A was a 49-year-old male from Lindstrom, which is 10 miles from WRSP. Interviewee

B was 52 and Interviewee C was 54; both were females living in Minneapolis, which is 56 miles from WRSP. Interviewee D was a 60-year-old female from Esko, which is 104 miles from WRSP.

3.0 Findings and Discussion

A concept map showing six categories and nine sub-categories emerged through inductive content analysis (Figure 1). Categories included learning (27% of coded text), enjoyment (30%), new attractions (29%), constraints (8%), economic benefits (4%), and damage to the environment (2%).

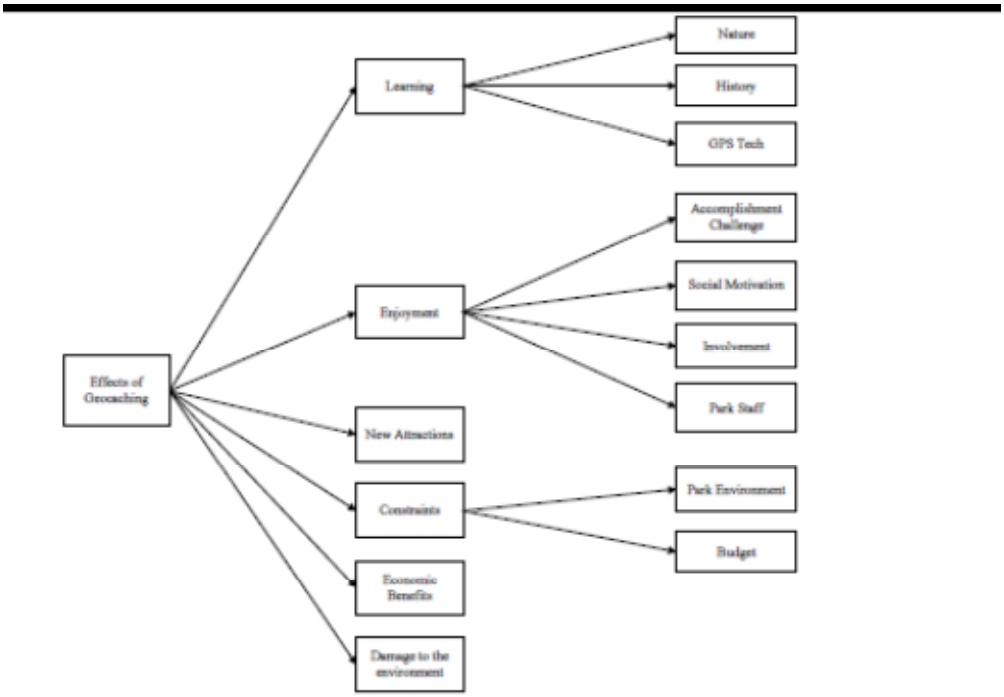

Figure 1

3.1 Learning

Findings suggest that participating geocachers experienced a greater understanding of the surrounding outdoor environment through GPS technology, consistent with Messick's (2009) research. Concerning natural resources, one interviewee recalled his shock after learning how logging changed the park's landscape. "I'm not like a tree hugger or anything, but I was really sad when I found out [about] the white pines just being gone and I couldn't help but think what this must have looked like [before]."

Additionally, findings show that participants experienced a greater understanding of WRSP's history as a result of geocaching. Barrie (2001) reported that visitors have meaningful interpretive experiences through outcome elements, which refer to understanding and remembrance of the topic. Participants in the geocaching interviews remembered learning about historic sites in the park. "I didn't know about all the logging and the stagecoach road [until we visited WRSP]." In searching for a cache near Nevers Dam, one participant learned about history. "[I remember] learning about Nevers Dam and how they transported lumber down the river. I didn't know anything about this kind of stuff. This definitely makes you more aware."

Findings suggest that the level of expertise and comfort geocachers have with their GPS units impacted their overall learning experience, confirming that the success of mobile learners may be influenced by their understanding of the mobile device (Koole 2009). Because of their comfort in using their GPS units, participants of this study were able to devote less time to their device and more time to learning about and exploring the surrounding environment. One participant became increasingly familiar with his GPS unit over time. "You get in the woods and [think] 'oh geez, it's got five hundred buttons on it. You do a couple of them [geocaches] a week and you keep familiar with your GPS. I can do anything on my GPS blindfolded in pitch-black now 'cause it's familiarity."

3.2 Enjoyment

Participants derived much enjoyment from geocaching. Similarly, Schneider and Chavez (in press) found that geocachers enjoyed testing their skills and being challenged by caches. Flow theory can be applied to the enjoyment participants found in geocaching. This theory states that emotions are energized and aligned with the task at hand during flow and that certain factors accompany an experience of flow (Csikszentmihalyi & Rathunde 1993). As applied to geocaching, those factors would include having a clear goal (seeking a cache), receiving direct feedback (finding or failing to find a cache), and feeling rewarded (when the cache is found). Findings show that participants derived a sense of accomplishment from geocaching; their desire to collect Critter Cards (obtained when locating caches in a state-wide geocaching program) was a driving force behind outings. Some participants had a goal of geocaching in all 72 of Minnesota's state parks. "We've been to 32 state parks [to geocache]. You'd think that over 50 year-old people wouldn't care about Critter Cards, but we do." One participant was among the handful of cachers who have been savvy enough to find History Cache I, a challenging cache that took him 30 hours to solve. "When you finally did it, you got a good sense of accomplishment. I was the seventh [to find History Cache I] and no one's finished it in over a year."

Findings suggest that geocachers enjoyed the human interactions associated with geocaching and viewed it as a social activity to be completed with family members and friends. "Me and my wife and the grandkids like to go, so we take them for an afternoon. We bring out [a] little grill and cooler with hot dogs or sloppy Joe's or something and we sit and have a nice lunch in the park. Sometimes mom and dad come with too." Seeking out park staff to communicate with was a large part of one interviewee's geocaching agenda. "They're the ones that know everything. Talk to them." This participant found value in speaking with park staff because they introduced new resources and attractions that the visitors may otherwise have missed. "I'll see one of the naturalists or a ranger and they'll point things out to you that you'd never even know if you didn't bother to take the time to ask."

3.3 New Attractions

Participants indicated that they traveled more due to geocaching, as they were eager to explore unfamiliar areas of the state and visit new parks. Similarly, O'Hara (2008) found that participants enjoyed discovering new places via geocaching and Schneider and Chavez's study (in press) found that 95 percent of participants traveled to participate in geocaching. Recreation specialization theory suggests that as a geocacher's interest in the activity increases, procedures related to the activity (such as traveling) will increase (Ditton et al. 1992). One interviewee dedicated entire days to geocaching. "We'll pick a spot that we haven't been to and we'll figure [this is the] middle point and then we'll go to three parks." With all participants, their desire to geocache allowed them to discover new areas of the state. "We see parks we never would have [gone] to," said one interviewee.

3.4 Constraints

Findings suggest that weather often served as a constraint to geocaching. Poor weather conditions can be classified as a structural constraint (Crawford & Godbey 1987) and may influence a geocacher's level of participation. If the constraint is particularly strong, a person may decide not to participate at all (Crawford et al. 1991). One participant cited the weather as being an inhibitor to finishing some of his caching outings. Speaking of WRSP, he said, "It can be really wet and muddy. That's why we didn't finish [a cache]. It was like a monsoon there." One interviewee recognized the impact that a weak economy, also classified as a structural constraint, can have on geocaching. "People aren't spending money. They're not spending $25 for a park pass like they did even a year ago."

3.5 Economic Benefits

Findings suggest that geocachers were aware of their economic impact on the visited area. One participant thought about his economic contribution to the park through the purchasing of an annual pass. He said the money spent on a pass would go toward maintenance projects and paying park staff. Speaking of geocachers, he said, "[G]et them in. You're bringing bucks into the parks."

3.6 Damage to the Environment

Some participants acknowledged that geocaching could cause harm to a park's natural resources. "I understand geocachers can't trash a piece of land." Speaking about caches, another interviewee noted, "You hate to see where the park is inundated with them because you don't want to ruin the tranquility of the park and have people tromping all over."

WRSP naturalists indicated that geocachers could have a negative impact on vegetation by forging their own trails and compacting the soil (D. Crawford, personal communication, April 17, 2010). This eventually makes it difficult for plants to grow and the animals that consume them will begin to suffer as well. Minor rule violations, such as straying from a hiking trail, can have a major impact when perpetrated by multiple visitors (Johnson et al. 1994). Tourists may perceive their actions as socially acceptable and may be unaware of their negative impact (Burn & Winter 2008). Gramann (2000) indicated that interpretive programs could be used to curb harmful visitor behaviors such as straying from designated trails and trampling vegetation. "Leave No Trace" principles and guidelines can also be used to communicate harmful behaviors to visitors (Marion & Brame 1996).

4.0 Conclusion

The results of this study indicate the importance of geocaching as a learning tool in natural areas. Geocaching can acquaint participants with the area they are exploring and participants experienced a greater understanding of WRSP's natural resources and history when following the path to a geocache. WRSP set up their geocaches to take participants past self-guided interpretive signs and on nature trails. Some caches required participants to solve puzzles relating to natural resources and history before they could find the cache location. These factors fostered a learning experience. Additional findings, although unrelated to the study's original purpose, indicated that participants experienced enjoyment and challenge in geocaching and viewed it as a social activity. Geocaching also served as a motivator for participants to travel to find new attractions. Although these findings are not related to the intended purpose of the study, they may be useful to consider in future studies.

Some topics that emerged in this research, such as geocaching's effects on the economy and environmental degradation, call for further academic investigation. This study served as a first step in exploring the possible use of geocaching in educating adult visitors about the natural resources and history of a state park. Findings were not intended to make generalizations about the topic of geocaching, but to explore and gather observations that may guide further research

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