Interpretive Technology in Parks: A study of visitor experience with portable multimedia devices

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ABSTRACT

The GPS Ranger is a new portable technology that uses a built in global positioning system to trigger video, audio, or slideshows that are displayed on a 4 inch display. Technological advancements have enabled devices like the GPS Ranger to be used in many new places including national parks. The purpose of this study was to undertake an exploratory investigation of GPS Ranger experiences in Cedar Breaks National Monument, Utah. Results indicate that GPS Ranger users primarily had experiences focused around nature and learning. Technology was not identified as major part of their national monument experience. Visitors' experiences with the technology were positive but some problems were identified. The device caused positive and negative changes in behavior.

INTRODUCTION

Learning, while visiting a new area, is an important activity for many travelers (Stewart, Hayward, Devlin, & Kerby, 1998). In national parks, one part of the park experience is the process of informal learning. Informal learning in national parks often refers to interpretive activities (i.e., brochures, ranger talks, self-guided trails, etc.). However, in a broader sense, informal learning is characterized as any learning experience that takes place outside of a school environment (Brody, Tomkiewicz, and Graves, 2002). National parks and many other protected areas are ideal places for visitors to learn informally. Csikszentmihalyi (1987) identified the components of "prior knowledge" and "opportunity" as being necessary for informal learning to occur. Ramey-Gassert (1997) describes the characteristics of the informal learning environment as motivational, engaging, enjoyable, nonthreatening, hands-on, experiential, and personal. National parks contain these elements making them ideal settings for informal learning to occur and according to Brody et al. (2002) national park visitors arrive with some prior knowledge that primes them to take advantage of the learning opportunities.

Travelers acquire information about their destination through a number of mediums. With the advent of new portable technology, information about specific locations (i.e., historic points, environmental education, and much more) can be automatically and efficiently delivered to visitors when they need it most, essentially on the road or trail. Research on technology and learning in informal settings is limited. A few studies, conducted in museums and zoos (Peart 1984; Beer 1987; Davidson, Herald, and Hein 1991; Ogden, Linburg and Maple, 1993), investigated the effects of auditory exhibits. One study, however, was conducted in a park setting by Novey and Hall (2006). They investigated the effects of audio tours on learning and social interaction in Carlsbad Caverns National Park. Hand held technologies that may be used specifically for informal learning (i.e., GPS Ranger, iPod, Blackberry, etc.), on the other hand, have not been formally studied within national parks.

One such device, the GPS Ranger, is used in Cedar Breaks National Monument (CBNM). The designers of the GPS Ranger describe the device as "a handheld GPS (Global Positioning System) mobile guiding device that can deliver your message to visitors" (BarZ, 2008). The GPS Ranger in CBNM delivers historic, geologic, and ecological information to visitors as they move around the landscape. The device also directs visitors to additional points of interest outside the park. Content on the GPS Ranger can be in the form of simple audio tracks played through a built in speaker or video files that can be interacted with through a color touchscreen display. While the technology is relatively new, it is available at 17 venues around the nation, including national parks, zoos, city walking/driving tours and university tours (BarZ, 2009). Finally, other technologies like cellphones and portable music players, which are in the hands of 89 percent of American adults (DigiTimes, 2008) and 60 million Americans respectively in 2007 (Siklos, 2007) are capable of delivering similar content to visitors. The significance of this new and growing information medium is that it enables tourism businesses and attractions to speak directly to potential customers in a format that today's visitors are both comfortable with and, in many cases, a medium they prefer.

The purpose of this study was to undertake an exploratory level investigation of GPS Ranger experiences. The results of this study can aid practitioners and future researchers in better managing and understanding the expanding use of onsite technology in places like Cedar Breaks National Monument. Additionally, many aspects of the research can be applied outside of natural areas and may be applicable to historic sites, zoos, and other locations frequented by tourists. Additionally, there is a growing gap in literature focusing on the use of technology in recreation/ wilderness areas for educational and interpretation activities.

RESEARCH METHODS

The qualitative research approach of phenomenology was chosen to guide this study. Phenomenology seeks to describe the meaning of lived experiences that groups of individuals have surrounding a phenomenon (Creswell, 2007).

In order to gather the data needed to begin to understand GPS Ranger user experiences, 25 interviews were collected during the month of July in 2007. This study used in-depth, semi-structured interviews to gather data. The interviews averaged 15 minutes in length but ranged from seven to 35 minutes. Each interview was broken into three components. The first component broadly explored the experiences of visitors to Cedar Breaks National Monument. Next, the interview focused specifically on the visitors' use of the GPS Ranger as it related to their experience. Finally, GPS Ranger users were questioned about their impressions of the technology (i.e., what did/did not work). Demographic data were also collected to allow the sample to be described and compared to future studies. The interviews were digitally recorded onsite as visitors ended their day with the GPS Ranger. The process described by Patterson and Williams (2001) of circular hermeneutic data analysis was applied to understand themes on the individual level and themes that are consistent between individuals or groups. The computer program, QSR Nvivo 7.0, was utilized to help manage, categorize, and analyze several hundred pages of interview data.

FINDINGS

The Cedar Breaks National Monument (CBNM) Visitor Experience. Visitors tended to discuss natural elements of the area (geology and ecology) when they discussed their CBNM experience and did not often describe the GPS Ranger directly as part of that experience.

> Ed: The vistas out there. It is great to be able to look down out there and see that contrasting terrain from high alpine to desert …and also the wildlife.
>
> Nick: We just did hiking. We did Inspiration Point and we went up and did the lake trail… we drove the whole road…we saw the chipmunks, lots of wildflowers.
>
> Doug: Mostly this time, just hiked around and watched the wildlife and the wildflowers are really great up here. I hiked out to the bristlecone.

Sometimes visitors would mention the GPS Ranger while discussing their learning experiences. Learning opportunities were achieved mainly through the use of the GPS Ranger. This may indicate that the technology is only subtly impacting visitor experiences. Thus, visitors are getting the benefits of the GPS Ranger (i.e., instant information about the natural environment around them) with few negative impacts from technology.

> Danna: I was consumed in this [GPS Ranger]
> Renae: She really enjoyed the GPS Ranger so I think that definitely added to her enjoyment. I think we definitely got what we were coming for. Just a nice hike, some good… decent views…. And the flowers!

The GPS Ranger Experience. The GPS Ranger was rented for two reasons. The most common reason was because visitors identified it as a way to learn about the geology and ecology. GPS Ranger users discussed taking advantage of any learning opportunities and actively sought all available sources when visiting a site. More specifically, the GPS Ranger was used to augment and not replace any specific information source (such as live rangers). The second less common reason for renting the GPS Ranger was to use a new piece of technology. Essentially, they were curious how it worked and what it would do. However, their curiosity was not only for the GPS Ranger, but also for CBNM. Thus, reasons for renting are anchored in the prospect of learning.

> Tucker: When we travel, one of our major impetuses is to try to learn something about the area, culture, history...
> Anne: Geology...geography...
> Tucker: So we thought this would be a really good opportunity. It's like taking an audio tour in a museum. You know, we do that in almost every museum we go to. So this was like that so that was an attraction. When I saw this, the first thing that occurred to me is oh, this is just like the audio tours!

> Aaron: …I always enjoy doing a ranger tour or learning more about an area. And I thought since there wasn't a ranger tour that was available, this would be a good option. And it was a chance to experiment with the technology.

> Beth: It was kinda cool.
> Ed: We were curious. It was a toy. It is something that appeals to all ages, adults, middle aged child like me, and the real children in there (gestures at kids in the visitor center).

Delivery of information from the GPS Ranger affected both the visitors' experience and their behavior. Changes in experience most often were identified as new learning opportunities. In addition to the perceived changes in experience, visitors also discussed changes in behavior attributed to the GPS Ranger. Behavior changes included hiking as a group rather than spreading out and encouraging people to go on hikes in order to find more information. Thus, content can potentially drive new visitation patterns.

> Linda: Well, as more information came up I was more interested.... And the marmot was cool cause they came up right when I was looking at them [the marmots]. Because at first I thought they were just the fat squirrels but then it [the GPS Ranger] popped up about the squirrels and I was like, "that makes sense."

> Eleanor: It helped us identify flowers that we didn't know.... And we didn't have a book with us so that was very very helpful.
> Stan: We found out about the road to the top [of Brianshead Peak] which we didn't get to do but...
> Eleanor: Yeah, another time, we'll have to come back.

Ed: Well, we just walked and when it triggered it was like "Oh, the noise! Let's pause." I mean at first, because when we hike we generally spread out when we hike and kind of go a little bit at our own pace. And so I think that we were a little more aware about me calling out " Ho! there is something coming up!" and everyone would gather around and I'd crank up the volume so everybody could hear it.

Not all behavioral changes were positive, and some new behaviors were potentially dangerous. Hiking while looking at the GPS Ranger was discouraged in the first video that played for renters, however, visitors reported hiking or driving while paying more attention to the GPS Ranger than to their surroundings.

Renae:… she was pretty obsessed with it. I was a little worried about her tripping on the trail.

Beth: We did notice that it is not safe to necessarily look at the GPS as you hike.
Ed: No! This is a serious issue!! When we came back we realized that the first part of the walk is on pretty loose limestone stuff out there. We didn't realize that going out because I was personally focused on the machine rather than on the trail. And it worked ok here but on a more precarious trail it could be an issue! There were times honestly, where I was more focused on the machine, enjoying it, than I was at actually looking at the stuff off to my right.

Aaron: It was a little distracting when I was driving. I would have liked to have had a place to pull over and also view what was on the screen during the narration.

Stan: It's kind of distracting when you're going down the road. I found out it makes me drive slower because I want to hear the stuff that is going on and I'm continually doing this[imitated a double take], you know, which I shouldn't be doing so I tended to... I think the pop up should pop up in parking areas because if you pull into a parking area and something pops up, that's a little bit better than when you're going down the road.

While content was described as high quality and appropriate in length, many interview participants requested that more information be made available. The GPS Ranger users are, as they physically and visually explore the park, seeking information on nearly every question or topic that comes to mind. In information behavior literature, this type of activity is sometimes described as information foraging. That categorization fits GPS Ranger users as they eagerly watched and listened to new information while they explored the site.

Ed: When you don't have this kind of thing available to you, you say "when we get home we have to look up that flower on the internet" and then you space it because you never do it. But here you have your "internet" resource. I know it is

not internet, but you have your resource right there, it like "Ok, let's pause and see what this flower is."

The GPS Ranger Use. The GPS Ranger is built to automatically display content to visitors based on their location. However, by using menu options, all the media can be accessed and played independent of the location. Visitors do not have control of the automatically displayed content but they can choose what videos to watch using the screen-based menu. Nearly all visitors who rented the GPS Ranger used both methods to access content.

Danna: Sometimes I let it pop-up and if I already saw it I would play it again if I didn't understand it.

Walter: Yeah [we relied on the pop-up method] exactly. It was good. We got two or three good ones. We were interested about the spruce beetle attacking all the trees. We heard about that and about the peak that's actually outside the park...

Jen: Once we got to the end, we went through the list and made sure there weren't any things that we kind of missed.

GPS content was generally perceived as quite good, but once the visitor got used to what the Ranger could do for them, there was a desire for more information. Also, repeating content proved to be bothersome for some users.

Nick: The content? I thought it was very informative, very clear, easy to understand. It wasn't too involved in terms of, I would say, it was a good amount of detail, without being too much...

Ted: Quality was great. Well said and everything.

Drew: …We really liked the bristlecone pines. We had several questions about them. It seemed like, I didn't see the answer on the GPS Ranger.

Seth … I was expecting a lot more. I really thought… even something about the water tower. Why the water tower is there. There is also a little house along the side of that trail. Nothing about that.

Tucker: The forest is alive with birds and it's so difficult to identify them. And since this is an audio as well as visual, maybe you could put songs of the birds on there? That would be very attractive to people. Like to see the picture and hear the song, they couldn't maybe see it, but they could hear that song.

Drew: my own preference would be a little more depth in the flora and fauna and I don't know how hard it would be to...it would probably be pretty hard...to put some kind of search tool in.

> Walter:…we got back around towards the Chessman side on the highway when the bark beetle one came up 3 or 4 times. And then we were like, ok, turn that thing off.

Using the GPS Ranger was a concern for some visitors who felt they were bothering others as they listened to the audio.

> Andrea:…we go to the overlooks, there's a lot of wind so even when you have it on the highest volume it's hard to hear. And also, we found.., like we were disturbing other visitors. Sometimes they just wanted some peace and quiet as they looked out.

> Adam: …we didn't have the volume all the way up because we didn't want to disturb people around us.

Summary. Visitors chose to use the GPS Ranger because of an interest in learning or of an interest in technology. Users if the GPS Ranger were driven by curiosity (the opportunity to learn) to explore both the GPS Ranger and CBNM. It was common to hear learning or gathering information discussed as something visitors normally do, or try to do, when they visit new places. Many of the visitors often take part in ranger presentations, read signs, and explore exhibits. The GPS Ranger is simply another way to get information. Additionally, visitors under time or weather related constraints who could not attend a live ranger presentation were left with few convenient options other than the GPS Ranger to learn about CBNM. The GPS Ranger was also convenient because it allowed visitors to escape crowds sometimes associated with live ranger presentations. Finally, some rented the GPS Ranger because, as a new piece of technology, it had a "cool factor." It was determined that these visitors' curiosity was not just for the technology but also for information in general.

Visitors perceived the GPS Ranger as changing their experience at the park and also their behavior. One family reported hiking more as a group so they were nearby when the GPS Ranger began to display a video. Others found that the GPS Ranger encouraged them to hike when they originally did not intend to do so. The GPS Ranger also caused some potentially dangerous behavior. Some people, even after being exposed to a warning message, would walk/hike or even drive while trying to watch a video. Generally, GPS Ranger users described their experience as much more educational because of the GPS Ranger.

The GPS Ranger is designed to be very easy to use. It displays content automatically and if visitors are inclined to do so, they can access videos using the touchscreen. Visitors could be described as searchers or observers depending on how they received their information. Searchers used the touchscreen to seek out content that they wanted to watch. Generally, searchers would watch all the content they could find. Observers watched only the videos that were automatically displayed by the GPS Ranger. Pure observers were rare and generally people used both techniques to find content.

APPLICATION OF RESULTS

This was an exploratory study on a new technology at a new site. Additional studies on the GPS Ranger or other technologies that provide visitors or users with location-based information can use this study as a starting point.

Also, because it was shown that the GPS Ranger technology was not an overwhelming part of the Cedar Breaks experience, managers of locations interested in using the GPS Ranger or similar technologies should feel more comfortable implementing its use without distracting users from the resource.

The GPS Ranger should be evaluated for task compliance and its ability to influence behavior. Specifically, the idea of the GPS Ranger changing experiences and behavior (driving visitation patterns) needs to be explored more in depth as it has the potential to directly impact tourism expenditures and length of stay. Also, signs and other interpretive mediums have been studied to understand how well people comprehend and follow messages or rules. Simple messages on the GPS Ranger could encourage users to complete a task or follow a rule (hiking a trail, asking a ranger a question, staying on trail, following a route, etc.). The results could help determine the correct tone, length of messages, and their overall effectiveness.

DISCUSSION

Today's tourists are relying more than ever on technology to learn about the places they plan to visit (Oschell and Nickerson 2006). Furthermore, the US population is increasingly becoming saturated with advanced cell phones (DigiTimes 2008) and devices like the iPod (Siklos, 2007) which are capable of providing tourists with the information and entertainment they crave. Finally, with the addition of devices like the GPS Ranger, tourism practitioners and researchers have been provided with an intriguing influential new medium to utilize and study. This study of the GPS Ranger opens the door to many new stimulating and necessary research avenues. The application of high technology devices to places like national parks or other wild areas may be seen as an invasion to some. However, this study has demonstrated that the educational benefits outweigh the technological impacts for users. Furthermore, one could argue that the GPS Ranger may in fact minimize the impacts of educating visitors by eliminating the need for signs in natural or historical settings.

While providing some answers about the growing use of technology as a tourist information system, this study should also be seen as a call to action for researchers. Tourism business and state and federal tourism sites are already taking advantage of these technologies and providing researchers with numerous opportunities to study in depth a number of findings highlighted by this study.

REFERENCES

BarZ (2009). *BarZ Adventures Venues.* Retrieved January 3, 2009, from http://www.barzadventures.com/GPS-Video-Tours/Venues/.

Beer, V. (1987). Great expectations: Do museums know what visitors are doing? *Curator, 30* (3), 206-215.

Brody, M., Tomkiewicz, W., & Graves, J. (2002). Park visitors' understandings, values and beliefs related to their experience at Midway Geyser Basin, Yellowstone National Park, USA. *International Journal of Science Education , 24* (11), 1119-1141.

Csikszentmihalyi, M. (1987). Human Behavior and the Science Center. *Science Learning in the Informal Setting* (pp. 80-87). Chicago, IL: The Chicago Academy of Sciences.

Creswell, J. W. (2007). *Qualitative Inquiry & Research Design Choosing Among Five Approaches.* Thousand Oaks, CA: Sage Publications.

Davidson, B., Herald, C., & Hein, G. (1991). Increased accessibility through multisensory interaction. *Curator , 34* (4), 273-290.

DigiTimes. (2008, April 7). *Cell phone usage continues to increase in US, says research firm.* Retrieved April 9, 2008, from DigiTimes daily IT news: http://www.digitimes.com/news/a20080407PR201.html

Ogden, J., Linburg, D., & Maple, T. (1993). The effects of ecologically relevant sounds on zoo visitors. *Curator , 32* (2), 147-156.

Oschell, C. & N. Nickerson 2006. Niche News: 2005 Nonresident Trip Planning and Satisfaction. Institute for Tourism and Recreation Research, The University of Montana. Retrieved January 5, 2009, from http://www.itrr.umt.edu/NicheNews06/2005TravPlanSatis.pdf.

Novey, L. T., & Hall, T. E. (2006). The Effect of Audio Tours on Learning and Social Interaction: An Evaluation at Carlsbad Caverns National Park. *Science Education, 91* (2), 260-277.

Patterson, M. E., & Williams, D. (2001). *Collecting and analyzing Qualitative Data: Hermeneutic Principles, Methods, and Case Examples.* Champaign, IL: Sagamore Publishing.

Peart, B. (1984). Impact of Exhibit Type on Knowledge Gain, Attitudes, and Behavior. *Curator , 27* (3), 220-227.

Ramey-Gassert, L. (1997). Learning Science Beyond the Classroom. *The Elementary*

School Journal , 97 (4), 433-450.

Siklos, R. (2007, October 7). *Why the iPod can be conquered.* Retrieved April 9, 2008, from CNNMoney.com: http://money.cnn.com/2007/10/08/technology/ipod_siklos.fortune/index.htm

Stewart, E. J., Hayward, B. M., Devlin, P. J., & Kirby, V. G. (1998). The "place" of interpretation; a new approach to the evaluation of interpretation. *Tourism Management, 19* (3), 257-266.

Stewart, E. J., Hayward, B. M., Devlin, P. J., & Kirby, V. G. (1998). The "place" of interpretation; a new approach to the evaluation of interpretation. *Tourism Management , 19* (3), 257-266.

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