



EDU 2011 Mobile Learning Pilot Final Report  
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## 1. Project Benefits

- a. **A description of how the wireless devices were integrated into the project's curriculum and objectives (including approximately how many times per week the wireless devices were used to access remotely and how many wireless devices were used during this period).**

The Mohican Outdoor School Mobile Learning Pilot differs in a number of ways from the majority of other projects funded under this initiative. Mohican Outdoor School provides outdoor resident education, in our rural, Butler, Ohio location, to students from a variety of locations and schools located throughout the state. As a result the student population is always dynamic and time spent at the location varies. The introduction of the Green Tech Mobile Learning Program (GT Mobile) was designed to provide opportunities for students and teachers to make realistic connections in the field to academic principles taught in the classroom. Additionally, a key goal was to expand the environmental education experience so participants could engage in web based lessons regardless of their location. A strong emphasis is placed on citizen science, or the use of students to assist with data collection in the field in areas such as surface temperature, water analysis, and other environmental issues. Additionally, the goal is to use this pilot project to leverage additional funds that will fund the development of web based environmental education lessons and conservation activities that will contribute to a healthier and longer lasting planet Earth.

There were three main objectives of mobile learning integration in the Mohican Outdoor School curriculum: 1) Global Learning and Observation to Benefit the Environment (GLOBE); 2) Scenic Rivers Stream Quality Monitoring (SQM); and 3) Natural Cache Program.

Use of the dataphones was not successful due to lack of suitable filtering, outdated platform (from the day we received them), and poor advice from the vendor. Likewise, the anticipated use of the Go Know platform was not achieved because of inaccurate vendor information (especially with regards to the dataphones and cost of software) and lack of funding for the platform. All program activities used netbooks exclusively.

The GLOBE Satellites program involved students of a participating charter school, using digital equipment to record location and surface temperature. The data was then uploaded to an international database to be used by NASA and NOAA scientists for climate research. The program reached completion in early April, 2012, with data collection completed in December, 2011.

The Stream Quality Monitoring program is an ongoing state (Ohio) program to assess water quality based upon the quantity and types of macroinvertebrate (insect) species present in the stream. Data for a nearby scenic river is recorded electronically and sent on to field ecologists for analysis.

The Natural Cache program has integrated use of netbooks with GPS technology, on site at Mohican School. Students use GPS receivers to locate pre-determined sites for study of topics such as dendrology (tree-study) and ornithology (bird study). Lessons are loaded onto netbooks so that students can follow instructions and educational links to websites, to complete specific learning goals.

We have committed to use of mobile devices as part of Mohican School's environmental education program. Twelve tablets were acquired for program use with students in October, 2012 as a part of this commitment. Twelve netbooks are also currently designated for program use with students.

**b. If available, a detailed summary of any data collected by the school or library on the project's outcomes and achievement of the project's goals, including usage of educational and research resources by students and patrons and number of devices actually used.**

No additional student data has been recorded since the last report. A total of 86 students utilized the netbooks as part of the EDU2011 pilot program. Throughout the grant cycle, Mohican Outdoor School was unable to record sufficient and reliable data due to planning and program infrastructure issues. Anecdotal data, based on observations, indicated that students who might not otherwise engage in environmental education content outside of a formal classroom, **were** engaged with the use of mobile technology in the outdoors, and immediately searched for more information on-topic. Educational and research resources are restricted to those allowed by the filtering software. Educational resources used most often included Cornell University's [allaboutbirds.org](http://allaboutbirds.org); [realtimerendering.com](http://realtimerendering.com) for bird, tree and wildflower identification; and The Ohio Department of Natural Resources digital field guides.

Regarding specific goals outlined in the proposal for this grant, progress achieved is listed below.

1. By June 30, 2012, at least 25 teachers will receive training on how to incorporate mobile learning technology into student lessons designed to be taught in the outdoors resulting in a 20% increase in the delivery of lessons via handheld computers to students in the field.
  - Eleven MOS staff members received training in the use of mobile devices in our outdoor education program.
  - Eight area formal educators received training in the use of mobile devices with Citizen Science projects, and use of technology in general to report scientific field experience findings.
2. By June 30, 2012, at least 750 students in grades 5 and 6 will complete experiential thematic lessons on environmental science delivered with the assistance of mobile learning technology.
  - Lessons including mobile technology have been designed and are in place for our GPS program called Natural Cache. Students have accessed these lessons and web links in the field to enhance their outdoor learning experiences. Examples of these lessons can be found in Appendix A.
  - CIPA-compliant filtering through Mobicip ([www.mobicip.com](http://www.mobicip.com)) is installed on all devices used for programs.
3. By June 30, 2012, students completing GT Mobile lessons will demonstrate a 20% increase in pre-test/ post-test scores.
  - One group of 16 students participated in pre/post testing in a bird study class. This class demonstrated a greater than 20% increase in scores; however, a larger sample of students would be required for conclusive data. Student internet use surveys were completed and data is reported at the end of this section.
4. By June 30, 2012, at least 3 months of water sampling data will be recorded via the use of portable wireless student devices.
  - There is no data for this goal. While student use of mobile devices has been successful “in the field”, MOS staff determined that the use of these specific devices by 11 and 12-year old children near large areas of water would most likely be detrimental to the devices.
5. By June 30, 2012, a minimum of 75 lessons will be delivered via a mobile learning platform such as Edmodo or some other platform.
  - This goal was not achieved for two reasons. First, MOS staff has lacked general technology literacy (which is not uncommon within the outdoor education field). Technology training was not provided in a timeframe that was conducive to accomplishing this goal. Second, MOS did not anticipate that visiting schools – our customers – would not want the use of technology in our outdoor education program content. The GT Mobile program was promoted and offered to all of the schools participating in our program. Few schools selected GT Mobile for their students’ outdoor education experience, and

some schools specifically indicated that they did not want mobile technology to be a part of their experience.

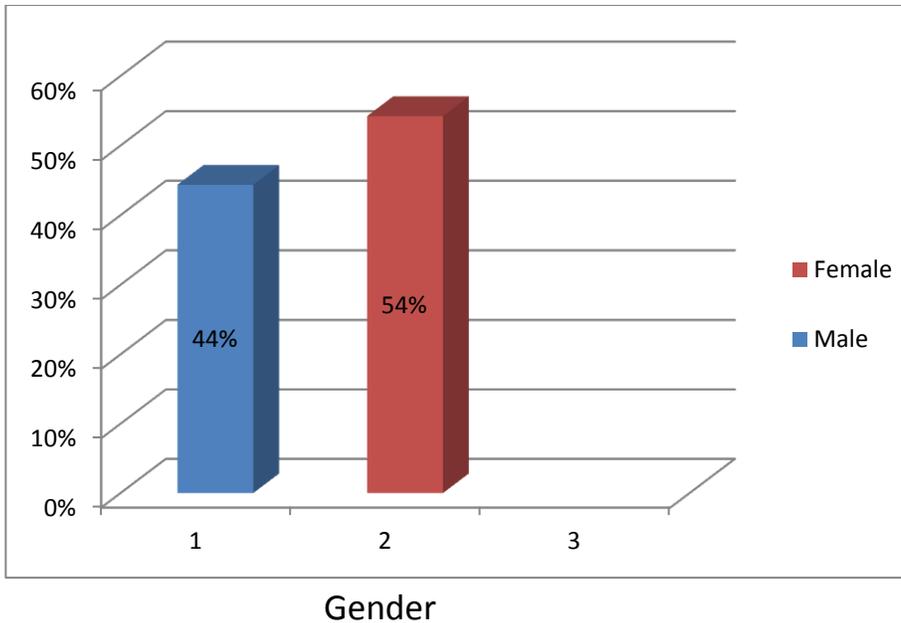
- c. **If available, a copy of any results or summary of the results of any survey given to the students, teachers, parents or library patrons to assess any aspects of the off-premises wireless project**

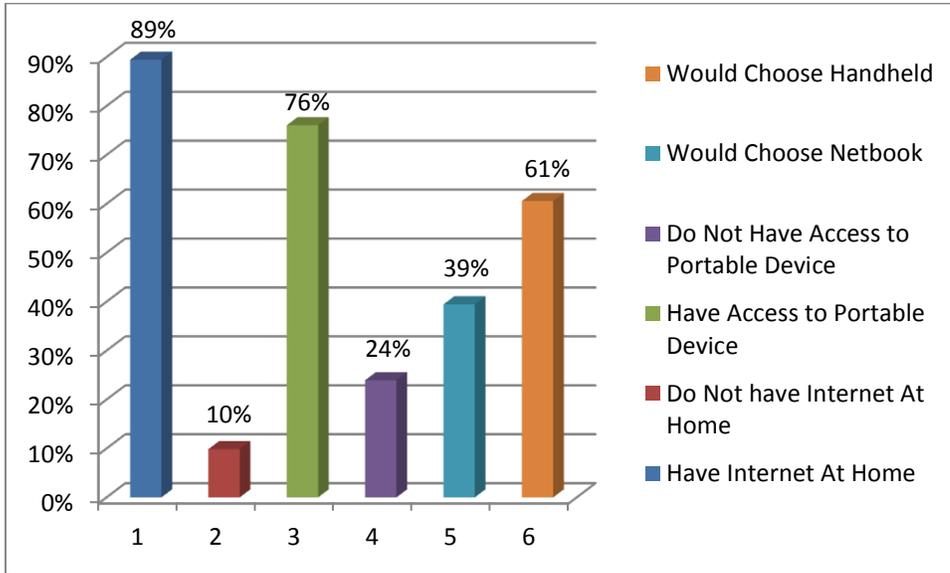
### Data Collected Regarding Student Internet Access at Home

Students were surveyed as to their access to internet connectivity at home. Two hundred sixty (260) students completed the survey. The survey consisted of 7 questions. In summary, the questions provided the following information:

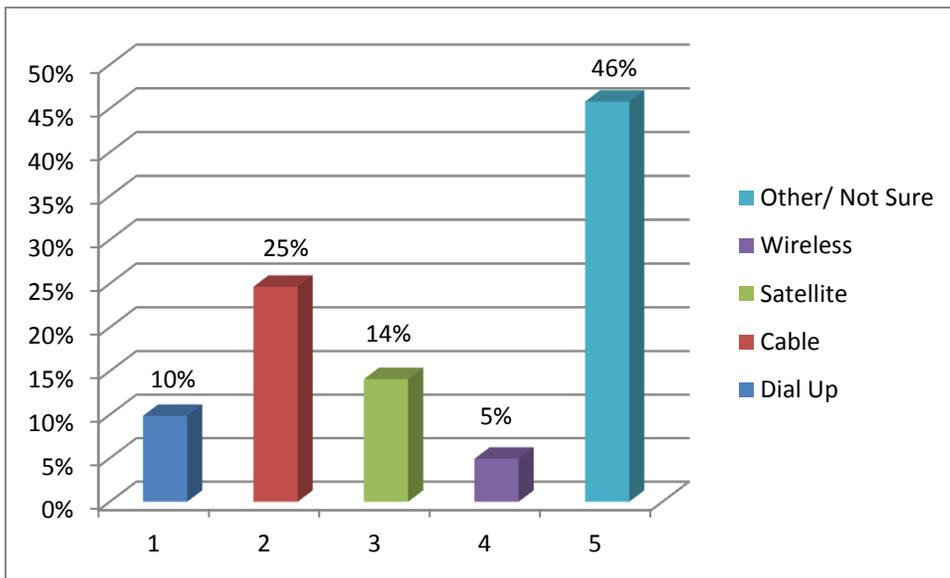
- Gender
- Internet access at home and type of internet access if available
- Frequency that internet is used to assist with homework
- Availability of portable internet connected device (netbook, tablet, laptop, Smartphone, etc.)
- Use of internet outdoors
- Preference of choice of netbook versus handheld learning device (smartphone without phone capabilities)

The following graphs illustrate data collected on surveys completed by students.

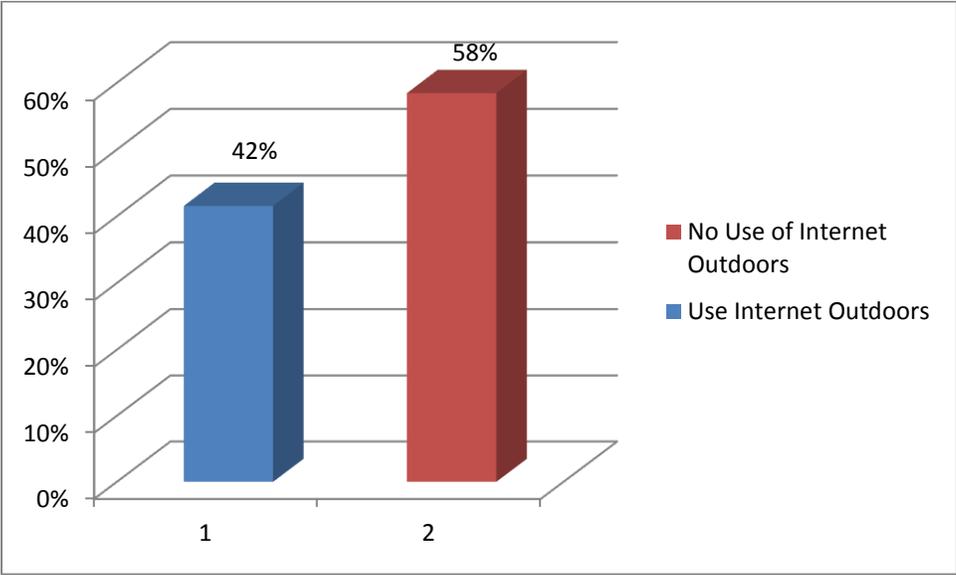




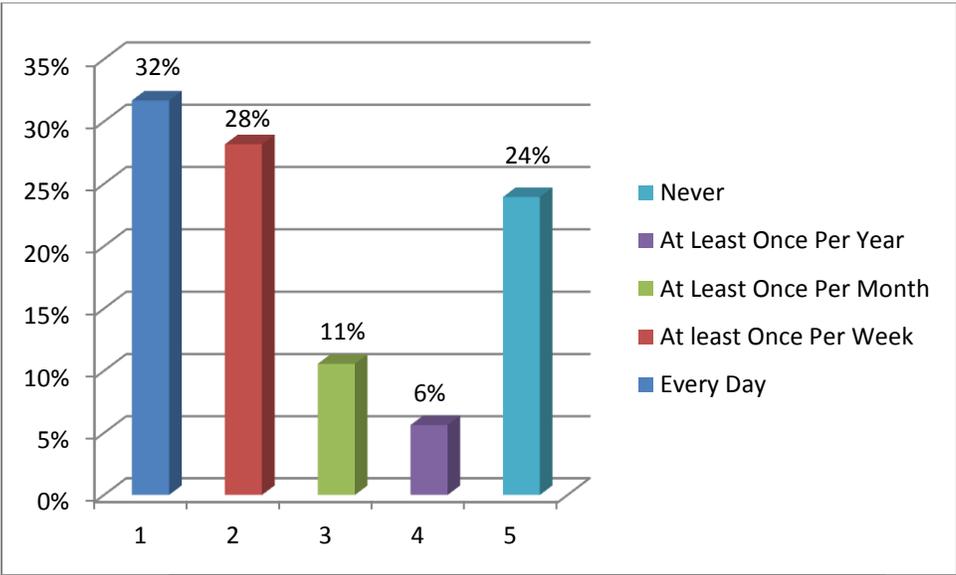
Internet Access Information



Type of Internet Access in Home



Internet Use Outdoors



Use Internet to Help with Homework

**2. Project Costs**

**a. Provide an analysis of per student or patron cost of the off premise connectivity.**

Within the Mohican Outdoor School program, students rotate through the school on a weekly, and sometimes bi-weekly, basis. We would request permission to count students as the library counts patrons, as it makes sense for us to do it that way. At present, 86 students have utilized the netbooks.

Our projected costs for this proposal are as follows:

Requested E-Rate Pre Discount	\$29,604
Match and committed funds	\$11,500
Total Cost of Program	\$41,104
Adjusted Anticipated number Served (Adjusted for late receipt of funds- 750 original students less 5 five months @ 63 students per month)	435
Actual Number Served	86
Actual per pupil cost before discount (including match)	\$478.00
Eligible E-rate discount funding:	\$23,683
Actual E-rate share of cost per pupil (23,683 divided by 435 students)	\$275

**3. Effectiveness of Protective Measures**

**a. A detailed description of the measures, including specific software or filtering mechanisms that were taken to ensure compliance with Children’s Internet Protection Act as well as a description of measures to protect against waste, fraud and abuse.**

Mohican Outdoor School has discontinued use of software by Arnet Technologies and has obtained filtering software from Mobicip. The Mobicip software is CIPA-compliant, available for both Windows and Android platform devices, and more cost-effective. The software is installed individually on each device. Fraud and abuse of devices remains minimized in our program as the devices are returned to the facility on a regular basis and do not remain indefinitely in the student possession.

**4. Lessons Learned**

**a. A description of any technical, operational, or administrative problems or issues associated with implementing the project (such as barriers in using the wireless devices or difficulties with the service) and a description of how those issues were addressed or are being addressed.**

The most significant issue for implementation of this grant was lack of staff technology training. Such training needed to occur prior to the implementation of the EDU 2011 grant. In the process of receiving training, staff has become more receptive to using technology in their outdoor classes. Students participating in the GT Mobile program did experience difficulties in the use of netbooks. Computer literacy is not something that can be addressed with students in a two-hour class. Control panel settings

on the netbooks were adjusted to eliminate some of the issues experienced by the students. The use of tablets with this program eliminates issues experienced by both students and staff. We have abandoned the use of the data phone devices and are shifting to the use of tablets with broadband internet access.

- b. A narrative of the lessons learned as a result of the off-premise wireless project (for example, based on what you learned from the project, how would you plan and implement your project differently if you were doing it over again?).**

If able to implement this project over again, Mohican Outdoor School would take a full year of planning which would include teaming up with a technology consultant and a non-formal education program that has engaged in this effort. It should be noted that amongst resident environmental education programs in the Eastern United States, very few, if any, are using digital or mobile devices in the way that Mohican Outdoor School has attempted. This statement is based on anecdotal information from the Association of Nature Center Administrators listserve. Additionally, we would scrutinize vendor recommendations in greater detail as we really did receive some inaccurate information in this area.

A customer needs assessment would have been useful in anticipating customer response to the GT Mobile Program. The use of mobile devices has been specifically promoted as a “tool” with our customers, to provide assurance that our program is still the hands-on outdoor program that they expect.

The largest challenge with the administration of this grant was the departure of the executive director, who also served as the administrator of the EDU 2011 grant. A second staff member should have been assigned to the administration and implementation of this grant with a minimum 50-75 % fulltime commitment. Mohican Outdoor School does not have a paid IT. Our volunteer IT oversees only our server system and related office computer issues. The technology coordinator is also responsible for much of the outdoor education program administration and operations as primary responsibilities. This program needed more administrative staffing and staff training.