

## Bus ride in rural district becomes key to STEM education

Getting more children interested in science, technology, engineering, and mathematics has become a national priority, and it is seen as crucial to the country's ability to compete globally. It's hard enough for schools in urban settings to accomplish this goal, and even more difficult for their country cousins.

However, infusing STEM education is not only a goal but a reality in a 630-student district in Arkansas, which covers about 300 sq. miles, most of it — 60 percent — located in the Ozark National Forest. At Hector School District, the bus rides are long, but on one run, the bus has become integral to STEM education. Children don headphones and settle back to watch math and science programs streamed onto customized computer screens. The programs not only spur interest in STEM during a ride, which is about an hour and a half long, but the driver reports discipline problems are fewer than they were before.

The initiative, which began this school year, is part of Aspirnaut, a program supported by Vanderbilt University that builds partnerships with rural districts to help them address the STEM gap. Getting buses online during what is otherwise wasted time is one of several Aspirnaut projects ongoing in districts in Arkansas and Maine.

In the Hector project, the district, Aspirnaut officials, and Diamond Bus Company worked together to give the bus the technical attributes and the educational resources needed. For Hector, the project was a good fit with a mission and vision that is heavy on an emphasis on technology, said Superintendent Karen Smith. "We want to integrate all the technology we can," she said.

The high-tech bus program is believed to be one-of-a-kind, but Julie Hudson, Aspirnaut program director, said she hopes it can be expanded. Aspirnaut receives grants from several sources so districts can afford to participate. The \$20,000 cost for outfitting the bus used in Hector, like most first efforts, was expensive because many technical uses had to be solved, Hudson said. But the solutions could make further projects easier.

### Challenges, benefits

Do these rolling classrooms represent a wave of the future that will help spur STEM education? Only time will tell, but here's more about the program operating in Hector, along with some of the challenges and benefits:

■ **Customized computers.** The bus has five 19-inch LCD monitors which are fully functioning computers mounted on the ceiling, said Wade Bonds, the district's technology director. Custom-built encasements have padding for safety reasons. Special brackets had to

be designed for proper installation. Nonglare screens and the ability to withstand the shocks inherent in moving down the road were also necessary design components.

■ **Tailored content.** The programming children see is differentiated by age. The monitors are placed so that children in a specific age group sitting in assigned seats view appropriate content. The district works with Aspirnaut officials to determine programming that will be relevant to what is studied in the classroom, Smith said. Watching the programs isn't mandatory, she said, but for the most part those in elementary and middle school children are regular participants. Many high schoolers would rather be on their cell phones, she said.

■ **Uploading.** Programs come from diverse sources, including the Discovery Channel and PBS. Vanderbilt uploads programming to a server in the district, where it can be routed to a wi-fi connection on the bus, Bonds said. All it takes to get the presentations going is for the driver to push a button, he added.

■ **Technical issues.** Initially, just the placement of the equipment was a big issue, Smith said. Figuring out how to wire all the computers in the bus was also a key technical problem, Hudson said. The drain on the bus battery meant an additional one had to be installed, she added. Each battery is now on a separate circuit so bus start-up isn't jeopardized, Bonds said.

Placement of the jacks for the headphones had to meet safety standards, Bonds said. The jacks are at the bottom of the seats. If a wireless headphone solution could be found, that would be better, he added.

For more information about the Aspirnaut program and school buses, visit [www.aspirnaut.org/bus-online.php](http://www.aspirnaut.org/bus-online.php). Contact Wade Bonds at [wade.bonds@hector.k12.ar.us](mailto:wade.bonds@hector.k12.ar.us). ■

### Key points

- Specially outfitted bus offers STEM programming via wi-fi.
- Long bus rides become venue to increase interest in math, science.
- Arkansas district partners with Aspirnaut program at Vanderbilt. ■