Science, technology learning getting major lift

By: Maxine Herr, North Dakota Living

With a smart phone or laptop at their fingertips, students can get the answer to virtually any question within seconds. So teachers attempting to teach fundamentals often hear from this generation of learners, “Why do I need to know this?”

As our nation’s students gradually fall farther behind their global counterparts in math and science aptitude, a new wave of learning is beginning to surface in hopes of causing students themselves to answer that question.

Valley City State University (VCSU), with the help if two significant federal grants, developed the Great Plains STEM Education Center (GPSEC). STEM stands for science, technology, engineering and mathematics, but it is more than just lumping these four subject areas together. STEM is an emerging set of transdisciplinary teaching methods and content in which students learn how to apply rigorous academic concepts to real-world problems.

“Some of these disciplines we’ve been teaching same as 50 to 100 years ago,” said Dr. Steven Shirley, VCSU president. “Technology has changed; the world has changed. But we haven’t taken a breath and looked around. ...We have to realize that maybe teaching methodologies haven’t kept up.”

Expanding upon the concept that students learn more by doing, STEM education provides hands-on projects that require intermingling all areas of learning to find a solution.

GPSEC offers various in-service training and workshops for K-12 teachers to include the Museum of Science Boston, advanced LEGO education and 3D modeling.

“For example, we’re done extensive training with LEGO robotics,” Shirley said. “If you think about how a fourth-fifth- or sixth-grader learns math or sciences, or basic building concepts, and then you do it in a fun manner, it’s certainly a good way to do that.’

Proof that the concept works can be found just 50 miles down the interstate from VCSU. The West Fargo School District created its own STEM center, adding a middle school dedicated to a curriculum based on those disciplines. When it began, it was part of a solution to overcrowding. The
community’s only middle school needed to remove approximately 200 students of its 1,400 student population.

But it wasn’t easy to coax parents into placing their child in a new, unfamiliar system. So the center offered a one-to-one computer initiative in hopes of luring them to the innovative school.

“When we opened, people didn’t know about STEM, so we dangled a carrot,” said Tabatha Joyce, principal of the West Fargo STEM Center and a graduate of VCSU. “We said every student would have a Netbook... then once we painted a picture of what STEM was, we were really popular.”

So popular that the sixth-through-eighth-grade STEM school is working to add ninth grade curriculum, and high school teachers have begun implementing STEM education in their classrooms as well.

“You can lecture to a class and it doesn’t mean they’ll learn, but if you design curriculum where they’re actively doing the lesson, they’re more likely to retain it longer and perform better on tests,” Joyce said. “I passionately believe in engaging students, and there is no reason why school can’t be fun.”

Since teachers traditionally have not been trained in STEM curriculum, Joyce said the GPSEC has been a big help in giving teachers the professional development to apply the new concepts. The teachers at her school spend significant time each day collaborating on curriculum to bring the core disciplines together and let students discover how to use them in real-world situations.

Joyce said when students are assigned with the task of solving a problem, it could involve reviewing history, developing a scientific problem, writing a public service announcement, and recording statistics. It gives them the opportunity to see how it all fits together.

“Right now the students are working on a crime scene investigation,” Joyce said. In doing so, math and language arts standards are being met just line in any other school, but the focus is toward using a problem-solving model.

Shirley and administrators of GPSEC hope that kind of learning will soon produce the scientists, architects and mathematicians the nation needs.