

Replenishing the Education Funnel

Ingredients Include STEM, Incumbent Workers

By Charlee Beasor

Picture a pipeline carrying liquid. No one pays attention to it when everything is working as it should and the water, oil or other substance is getting to its needed destination. But over time, the pipeline begins to dry up and there is less output; still only a few people notice.

One day, however, the pipeline is completely dry. At this point, everyone is keenly aware of a crisis.

Some contend Indiana is getting closer to that scenario with its many education and workforce challenges as the pipeline of trained and qualified individuals has been slowly (or more quickly, depending on the industry) drying up.

While the picture may seem bleak, it's possible for the pipeline to be mended. It means the pump needs to be primed in the right way – one that meets today's unique challenges.

The Indiana Chamber of Commerce has set out 33 ambitious goals in *Indiana Vision 2025*, the long-range economic development plan for the state. Objectives include increasing the amount of Hoosiers with post-secondary degrees; more students considering science, technology, engineering and math (STEM) fields; and helping adult and incumbent workers gain the skills needed to get back into the workforce.

BizVoice® brought together a panel (all *Indiana Vision 2025* regional forum participants) to discuss how some of these important goals might be tackled.

Participants:

- Bruce Hibbard, superintendent, New Albany-Floyd County Schools, at www.nafcs.k12.in.us
- Jim Heck, executive director, Grow Southwest Indiana Workforce, at www.workonesouthwest.com
- Ellen Rosenthal, CEO, Conner Prairie, at www.connerprairie.com
- James Dworkin, chancellor, Purdue University North Central, at www.pnc.edu

Indiana's STEM landscape

While education and business leaders are more familiar with the importance of STEM today, the push to get Hoosier students interested in pursuing a STEM-related degree could be even stronger.

Hibbard laments that there isn't more being done at the K-12 education level to focus on all facets of STEM, not just mathematics. The New Albany school district has introduced Project Lead the Way



“Early education has to be very experiential. It has to fan the interest and encourage kids to stay at tasks. It’s (about) encouraging them to pursue a passion and to stay at it and keep going and be resilient.”

*Ellen Rosenthal
Conner Prairie*

(project-based STEM curriculum) to eighth graders for the first time this year. The high schools also offer advanced placement course work in chemistry and physics.

“K-12 education with the STEM initiative has been somewhat void, particularly in the last 15 years. Particularly, K-8 has been focused on English, reading and math,” he explains. “And, of course, math is part of the STEM initiative, but that’s where the focus has been.”

Over the past two years, the district has worked with Larry Ainsworth, author of *Rigorous Curriculum Design*, to put additional emphasis on science and social studies.

“It’s the whole notion of how can we bring rigor and relevance to those two areas that, really, over time, over the last 15 years, have really not received much staff development – professional development whatsoever – except for high school teachers that were teaching advanced placement,” Hibbard emphasizes.

Conner Prairie – which might not immediately spring to mind as a forum for STEM learning – has been active in bringing hands-on, contextual science learning to Central Indiana since 2006. When Rosenthal came to Indiana in 1999 from Pittsburgh, she noted that there weren’t many informal science education experiences for area children (with the exception of the Children’s Museum of Indianapolis).

“History is everything man has ever done. There is really a very important part of our history that’s involved with science, with innovation, with technology; (important) developments in technology, when you think

about what’s impacted our lives today,” she describes.

Conner Prairie created a year-round science exhibit; it emphasized Indiana’s medical history; and the popular 1859 Balloon Voyage exhibit, focusing on engineering and technology, opened in 2009.

The facility received part of a National Science Foundation grant in 2012 to take a national leadership role in helping encourage history museums to incorporate more hands-on science learning in a historical context.

“There’s a lot of research to suggest that kids, in particular, better understand science and math learning if it’s in a real context,” Rosenthal asserts. “And now we have a prototype exhibit called ‘Create Connect,’ which is really interdisciplinary learning. It’s hands-on science in the Indiana historical context.”

The right approach to STEM

Purdue North Central offers classes and degrees in the STEM fields. Dworkin emphasizes that more people need to consider STEM careers and education because there are jobs waiting to be filled.

“We have people that don’t have the skills to fill those jobs. We have to retool and be ready to have people that can be energized and ready to fill those jobs in the future,” he says.

Heck is well aware of the need for more Hoosiers with STEM skills and credentials. His Southwest Indiana region is bursting with advanced manufacturing companies looking for skilled workers.

“Some of the premier companies down there ... the days of just hiring somebody, as we used to say, ‘They hired them from the neck down just to come in and shoot screws,’ are over. So they need somebody that can come in there with skills, and they’re having a really hard time finding that, at least in my area,” he maintains.

“It appears to me that there needs to be an increase in those skill levels coming out of both high school and postsecondary,” Heck continues. “I think more of them need to go into (STEM), but I think it’s incumbent upon everybody to make it where they want to go into it. And I think that’s the real challenge, how do you make them want to go into it?”

Start them down that path early, Dworkin offers.

“In the past, we’ve discouraged a lot of kids at a younger age and told people they

weren’t good in math, and science was hard,” he asserts. “And I think what we have to do is encourage people that these are subjects that are fun and interesting. And that’s why, if we start at an early age with kids, we’ll get a lot more people interested in that.”

Rosenthal notes that it’s not just a question of how early to start students, but also what methods are best.

“I think the research really has shown ... that babies, infants, toddlers are really natural experimenters in science; they’re exploring the world. And I think it’s our job ... to follow that interest, not in a heavy-handed worksheet way, but in a very contextual way,” she maintains.

Dworkin adds, “I would say, without a doubt, that if we get the children started early in thinking about these kinds of STEM concepts, they’ll be more likely to at least consider that kind of a career.”

“There are some wonderful longitudinal studies going back 30 to 40 years of students who had early childhood education versus sort of a matched sample of ones who did not. And if you look at those students 30 years afterward, on any dimension that you can think of, the ones who had early childhood education are ahead,” he explains.



“I’ve got five or six postsecondary institutions in my region, and they all talk about their STEM initiative or they have their own STEM initiative. I think it would be better if they could collaborate and make it one big STEM initiative.”

*Jim Heck
Grow Southwest Indiana Workforce*

There has to be a balance between preparing students for required educational assessments and fostering their natural creativity and interests.

"I think our time has been spent, since the accountability laws came into effect, that we really want to do a good job in English, reading and math, and the other ones have gotten short shrift as far as staff development and also what we think is important," Hibbard offers.

All agree that Indiana needs to join the list of states that has universal preschool and mandatory kindergarten.

"And we only have 180 school days," Hibbard attests. "So, if we were going to really improve education, it wouldn't be grading schools A through F; it would add another 20 to 30 days to a school year. Often we get compared with Japan or Singapore on these terms. And they go to school a lot more than we do and they have longer days than we do. And so that would only be beneficial to

our students if we would do that as well."

Step one: Parental involvement

Two other critical factors in getting more students interested in STEM and continuing education: parental involvement and out-of-school learning experiences.

Rosenthal recalls a visit she did with a fourth grade gifted and talented class in Indianapolis, to learn about their Conner Prairie field trip. She was amazed at how many students had experienced some of Central Indiana's cultural learning environments – including the Children's Museum, Conner Prairie, the Indianapolis Museum of Art, the Indianapolis Zoo and more.

"These kids were being taken, by their parents, to these out-of-school learning experiences at such a phenomenal rate, which made me start to think – and I'm not an educational professional, so I can't speak to whether this is consistent – how much parental involvement and encouraging



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*Bruce Hibbard
New Albany-Floyd County Schools*

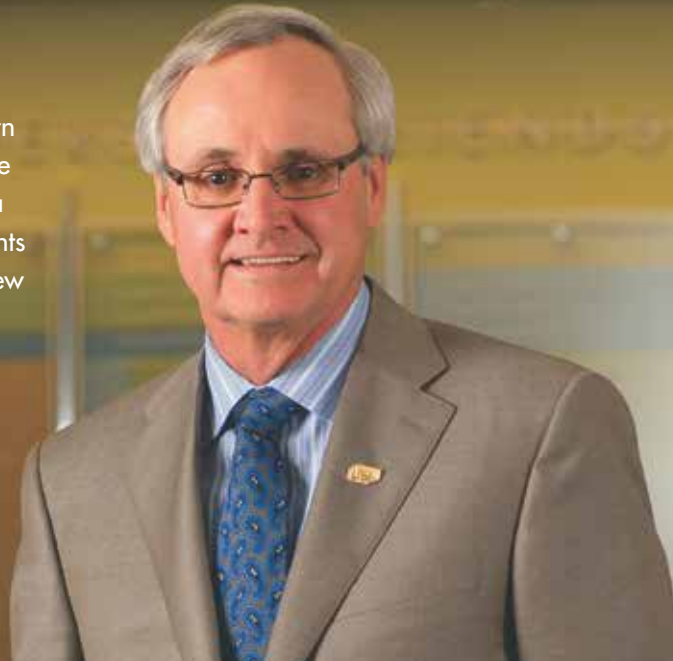
learning really makes a difference in what happens to kids over time," she contends.

In response, Hibbard recalls a study done years ago about the factors in student success.

"I have to say the University of Southern Indiana has always played a role in the success of our business. I talk with area CEOs regularly and every one comments on USI's value to the region and the view that its graduates have a significant positive impact on their businesses."

Ron Romain, Class of 1973

Chief Executive Officer
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“(It) said that the first factor you look at was the parents’ wealth,” he explains. “Their socioeconomics. But number two was how parents thought of school ... so, it would actually trump socioeconomics if Mom and Dad thought education was important.”

Utilize the resources you’ve got

Indiana’s rural landscape is a potential barrier to these types of learning experiences, the panel agrees. It can be too expensive for rural schools to send students to field trips in other parts of the state. But Indiana’s natural landscape also offers plenty of opportunity for STEM learning right at home.

“I’m up here in a rural area,” Dworkin offers (via conference call). “LaPorte County, where I’m sitting at right now, is about 90% agricultural. But if you talk to people in agriculture at Purdue University, they’d tell you that agriculture is all over STEM right now. It’s really important.

“And so maybe there are some regional differences in STEM needs based on what industries or occupations are needed in various areas, but I would argue that you need to have a big push on this no matter what part of the state you’re in, whether it’s a big city or a rural area.”

It’s time to work together instead of competing against one another, Heck says of regional higher education institutions.

“It seems like (the postsecondary institutions) get more siloed and more competitive on what they’re trying to do,” he points out. “I’ve got five or six postsecondary institutions in my region, and they all talk about their STEM initiative or that they have their own STEM initiative. I think it would be better if they could collaborate and make it one big STEM initiative.”

Dworkin acknowledges that is common, but not quite as big of an issue in north central Indiana. Partnering together – not just among educational institutions, but also local businesses getting involved and telling the institutions what skills they need – will make the difference. He gives an example of a local school teaming with a regional energy provider to train students in exactly the skills the company requires.

“They realize they need to have the right kind of people, because right now they don’t have the right kind of people,” he describes.



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*James Dworkin
Purdue University North Central*

“They’re just hanging around waiting for those skills. We have to train those people. ... We need a little patience, because it won’t happen overnight.”

Have business leaders been proactive enough in telling education leaders what they need? Maybe not, but they’re starting to figure it out, agree Heck and Dworkin.

“They’re beginning to realize they’ve got to get a better message across to the people that can make that happen,” Heck emphasizes.

Dworkin says, “I think that’s exactly right. I think it depends on the industry. Many times in our meetings with a lot of business leaders – you hear generalities about we can’t find the skilled workforce. ... I think some of them are starting to get the message, and I think a lot of the others will as well.”

Adult, incumbent challenges

A major hurdle for Indiana (and others) is the large number of adult and incumbent workers who lack basic skills for the many available jobs.

“That’s who I see in my WorkOne offices, because they’re really struggling. They don’t have the skills that they need,” Heck acknowledges. “That’s the big issue we’re facing, trying to talk a 40- to a 50-year-old person into going back to getting something to help them get back into the workforce. So we’re really pushing stackable credentials.”

Heck explains the value for workers, using welders as an example.

“They can complete a welding certification and be AWS (American Welding Society) certified, and go out and get a job that pays them \$70,000 a year. And then they can build

on that with a machinist or CNC operator or whatever they want,” he says.

Whatever the steps, Heck notes, getting these people trained and back into the workforce will help “bridge this gap between the workforce now that (businesses) need and the one that’s coming through the pipeline.”

Dworkin agrees that stackable credentials are important.

“I encourage people to get a college degree, but you don’t need to have a college degree to get a good job. But you do have to have this credential or some sort of 21st century skill that will get you a job, and then you can stack on from there,” he adds.

They’re hopeful

By all means, it’s not all doom and gloom. Awareness of the need for more STEM credentials is at an all-time high, according to Heck.

Dworkin agrees that not only is there more awareness of the issue, but that action is being taken around the state to correct the problem.

“I would go back five years and say back then you just heard talk, talk, talk and not much going on. I’m pretty optimistic now. On a scale from zero to 10, where zero is pessimistic and 10 is very optimistic, I’d say I’m about a seven. I feel pretty good now, but we have a lot more work to do,” he grants.

Rosenthal notes also that Conner Prairie is working on the innovation and entrepreneurship side of STEM, something Hoosiers have in their history. (She cites cruise control, disposable diapers and the alkaline battery among many creations from Hoosiers).

“I’m not only optimistic about creating a broader workforce that knows about STEM and feels comfortable with it, but I’m also optimistic about the whole idea of entrepreneurship and what we’re going to produce through the universities, (and) through entrepreneur centers like Launch Fishers that will get STEM off the ground at a different level as well,” she offers.

Hibbard wants to see more positivity about Indiana’s education system.

“We’ll go a long way if we’re a lot more positive about our education system in Indiana. Just telling people it’s not very good, to me that seems counter to trying to have a great workforce,” he concludes.