

An overhead photograph of a modern learning environment. On the left, a person in a green shirt sits on a red sofa, looking at a laptop. Next to them, a person in a dark shirt sits on the same sofa, also looking at a laptop. In the center, a black table holds several papers, a laptop, and a water bottle. On the right, three people are seated on another red sofa. One person is looking at a book, another at a laptop, and the third at a book. The background features large green and blue geometric shapes.

# Future-Ready Learning: Outfitting Students for Workforce Readiness

*To ensure future workforce requirements are met, educational outcomes must align with industry needs. In many cases, that means exposing students to the tools and technologies they'll use in the workplace.*

Work is changing dramatically. Digital disruptions mean new categories of jobs will emerge. These jobs will partly or wholly displace some current occupations and require new skill sets.

"In many industries and countries, the most in-demand occupations or specialties did not exist 10 or even five years ago, and the pace of change is set to accelerate," states a World Economic Forum report on the future of jobs.<sup>1</sup>

How can schools ensure they outfit students with the skills and experience they require for the new world of work?

In many cases, enabling students to use the technologies they'll use in the workplace — or utilizing technology tools like virtual reality, augmented reality and simulation that allow them to work alongside professionals, both virtually and physically — can help ensure students graduate more prepared for high-demand fields. And, according to a recent study, higher education institutions that provide this type of preparation are more likely to attract top students.<sup>2</sup>

This paper examines how colleges and universities can successfully incorporate technology to help prepare students for the new world of work.

## THE EVOLUTION OF THE WORKFORCE

Three primary drivers are changing work and learning:<sup>3</sup>

1. Advances in automation and artificial intelligence (AI), which will replace rote activities in financial services, law, insurance and many other cognitive activities in industries "more commonly associated with middle class jobs."
2. The growth of the gig economy, which currently touches a third of the total U.S. workforce and is expected to reach 43 percent by 2020. Those who are most successful possess specific, highly marketable skills and the ability to adapt and add to their skills as work opportunities evolve.
3. The rise of millennials in the workforce, since younger employees are typically more job-transient and plan to have multiple careers throughout a lifetime.

These shifts in the job market mean a college degree that “used to guarantee entrance into the American middle class, now can’t even help those grads land a full-time job,” says a McKinsey public sector analyst.<sup>4</sup>

Part of the issue is schools and employers don’t always agree on which skills are essential. A 2014 survey of provosts found 96 percent believed their institutions were “already doing a good job at preparing students for the world of work.”<sup>5</sup> Yet a Gallup/Lumina survey conducted at around the same time found just one-third of company leaders agreed that graduates had the skills and competencies their businesses needed.<sup>6</sup> In a separate survey of employers, 45 percent reported that a skills shortage was the leading reason for entry-level vacancies in their organizations.<sup>7</sup>

One solution for closing the gap is to make sure educational outcomes align more closely with industry needs.

What skills do today’s college students lack? They can be organized into four categories:

- **Soft skills.** Education has long recognized the need to emphasize soft skills such as communication and collaboration, but there are others to emphasize as well: diplomacy, teamwork, relationship-building and time management.
- **Commercial skills.** Similar to soft skills, these promote maintaining a professional persona, such as how to handle a phone call or meeting and how to see things from a client or customer’s point of view.
- **Hard skills.** These include training and experience in business writing and public speaking as well as specific expertise for highly complex jobs in medical, engineering and computer science/big data fields.
- **Technical skills.** Many 21st-century jobs call for proven experience in coding, data science and technology.

Part of the problem is the professional-grade tools used in the work world often aren’t the same tools students use in their daily learning environments. For example, Tracie Bryant-Cravens, vice president of sales at AVI-SPL, an integrator of audio-visual and collaboration solutions, says her company often sees career centers on campuses that are “poorly staffed and poorly equipped and therefore don’t get the buy-in from industry to recruit from their campuses.”

The same problem surfaces in learning spaces “that don’t mirror the technology that industry has available, putting students who graduate from these programs at a disadvantage,” she adds.

Savvy colleges and universities recognize the pivotal role they play in helping students gain the skills they need to succeed. Apprenticeships, industrial placements and work-based degrees

## TOP TECHNOLOGIES FOR WORKFORCE READINESS



**Interactive displays and huddle rooms.** Interactive flat panels, short-throw interactive projectors and presentation systems enable multiple users to mark up, highlight, edit and reorder work simultaneously. Management interfaces allow that work in progress to be shared only within a single “huddle” or displayed on every board in the same room or in multiple rooms.

**Visualization and simulation.** The aeronautics and aerospace industries have used visualization and simulation technologies to train pilots for decades. Today this type of environment is more affordable; can take up complete walls and rooms; and is used to for training in law enforcement, medicine, emergency response, data research and other complex fields. The learner can fine-tune his or her response and develop “muscle memory” by visualizing high-stress situations before facing them in the real world.

**Augmented reality and virtual reality.** In VR, specialized headgear places the learner in a 360-degree virtual scenario, armed with a controller that serves as a tool for manipulating whatever is being studied, whether that’s human anatomy, the solar system or an archaeological specimen. AR doesn’t require the headgear. The real world still exists, but it has been enhanced with additions, such as labels for the buildings, descriptions of body parts or translations of terms.

have all found pick-up again in colleges and universities, Bryant-Cravens notes. But they tend to be small programs that can’t be easily scaled. What can scale is technology.

With help from a company like AVI-SPL, educational organizations can integrate advanced, secure, effective AV and collaboration solutions to connect students to the resources and technologies they need to prepare for successful careers.

### EXAMPLE OF SUCCESS: RICE UNIVERSITY

Rice University recently launched the Data Analysis and Visualization Cyber-Infrastructure (DAVINCI) project, funded by the National Science Foundation and deployed in Rice’s Chevron Visualization laboratory. The ambitious data analysis project required Rice to implement a 3-D data visualization lab.

Rice selected a 200-inch 3-D, stereoscopic, immersive visualization screen, which helps researchers understand structures spanning molecules, nanotubes, subsurface images, astrophysics, bridges and buildings. Rice then chose AVI-SPL, whose team of Control Room Group experts has deep experience with developing and integrating solutions that present complex sets of data through visually accessible interfaces, to implement the new equipment.

“The technology solution needed to be completely transparent so users could conduct their work unencumbered,” says Bill Schmidt, AVI-SPL Control Room Group market manager.

At the forefront of the visualization solution is Barco’s OLS-521 3-D stereoscopic video wall. Thirty-three million pixels are compacted into an image area that measures 14’ wide and 8’ high. The sharp resolution and 3-D presentation enables researchers to see and manipulate details that would otherwise be invisible.

“We provided just the right level of fidelity for users to view their scientific data to enhance collaboration and discovery,” says Schmidt.

AVI-SPL’s solution allows users to project data onto the visualization wall and create realistic renderings of volumes, surfaces and illumination sources. AVI-SPL also implemented an optical tracking system that allows researchers to track their position among data and images in three dimensions so they

The smart use of virtual reality, augmented reality and simulation and interactive technology can play a role in bringing students up to speed on many of the skills experts possess.

can interact with the data. Data imagery can be shared with as many as 25 students or professionals wearing specially designed 3-D glasses.

“Users who have visited the lab and started using the DAVinCI visualization wall have been very impressed with its capabilities,” says Erik Engquist, manager of Rice’s Chevron Visualization Laboratory.

The increased computational power of the visualization wall will help Rice’s researchers make new discoveries while also preparing students for careers in which data visualization is a valuable skill.

“There is a lot of excitement about using the wall, finding ways to use visualization and developing workflows that will help advance our research objectives,” says Jan Odegard, Rice’s executive director of the Ken Kennedy Institute for Information Technology. “Not only do we see interest across the schools of science and engineering, but also in the schools of architecture, social science and humanities.”

## EXAMPLE OF SUCCESS: GEORGIA STATE

Georgia State University recently launched “Digital Learners to Leaders,” a three-year program that connects the university with local businesses and government and community organizations to pose job-related challenges to students. Then, explains Julian Allen, Ph.D., senior director of learning innovations in the Center for Excellence in Teaching and Learning, those organizations work with students to refine their solutions and provide them with practice in job-related skills utilizing technology.

“A constant conversation for us is, ‘What skill sets do graduates need to have as they walk out the door to get jobs?’” explains Allen. “The jobs our students will have five years after they graduate will look nothing like some of the jobs available today.”

To help students prepare, they go through a series of sprints, says Allen. “One sprint will be on project management skills, one will be on coding skills, one will be on design thinking skills, so that over that period they pick up all the skills they need to successfully deliver a product or solution to the challenge and — hopefully — tie it to an internship at the end.”

To emphasize the real-world nature of the work, the problems — and the students tackling them — reach across disciplines.

“We wanted to create teams that would bring together a

## USING AI TO ALIGN EDUCATION AND JOB SKILLS



Some colleges and universities are turning to AI to better understand which skills employers in their area need from new hires.

Tech start-up CourseAlign has automated the process. The company applies AI to job listings provided by numerous job sites and runs comparisons of that data against the learning outcomes listed for various college courses. CourseAlign reports any gaps between the skills companies need and the skills colleges are teaching. Academic leaders can access a dashboard that helps them understand where their programs need to bolster coverage to address skills sought by the organizations in their area.

The technology can save universities time over more traditional approaches like calling each employer in the area to inquire about their needs.

CourseAlign “gives you a pretty good idea of what’s going on ... in the markets you serve as a university,” says CourseAlign co-founder Robert Blackledge.

marketing student, a psychology student, a computer science student — all working together — because designing an app isn't just about coding; you need to understand your user," Allen says.

The students acquire a portfolio "of demonstrable artifacts of their learning," Allen adds. "It's not just saying, 'I got an A in my coding class,' but, 'Here's an app I built,' or 'Here's an interface I designed.'" Participants begin thinking of themselves "not so much as a student, but as a digital entrepreneur, as a coder, as a social scientist solving problems in the community. It changes their mindset from 'I'm a learner' to 'I'm a problem solver.'"

## HOW TO BUILD A BRIDGE TO BETTER OUTCOMES

Students who tackle coursework incorporating newer modes of operation and workplace interaction are the individuals companies want to help guide them into the future. Therefore, schools must adopt flexible and adaptable technologies and work spaces that mirror what students will find in the workplace. Ultimately, the schools that produce graduates with the right skills to land the most desirable jobs will be the ones that create powerful curriculum that includes real-life problems, data analysis, training simulations, and interactive, collaborative team work; that have facilities outfitted with current and future-looking technology; and that stay on top of industry skills, trends and applications.

## BEST PRACTICES FOR UNIVERSITY-INDUSTRY COLLABORATIONS



Using technology effectively in education is complex, and colleges and universities can't work in a vacuum. Bringing in a partner that understands the higher education environment can help students get the learning outcomes they need. The following are best practices for successful university-industry partnerships.

**Get specific.** It's important to determine what industry representatives mean when they say they need specific skills, advises Terence Cavanaugh, associate professor at the University of North Florida. For example, if somebody tells you they want candidates who can code, ask, "What do you mean by that?" Get samples and analyze them.

**Make learning about practicing.** That way, learning is more likely to reflect what goes on in the workplace, says Cavanaugh. For example, find ways to assess skills beyond typical multiple choice/true-false testing.

**Reach out to talent management leaders.** The goal isn't necessarily to find out what "exact skills" organizations need, says Georgia State's Julian Allen, but to set up a process for working with them regularly.

**Get current with technology.** There was a time when everybody had a "presentation mentality," says AVI-SPL's Tracie Bryant-Cravens. "They had to have a projector they could plug their laptop into and content they could readily display." That's the way both schools and companies operated. Now, she notes, "all you need is a USB stick with everything pre-loaded, you pop it into any interactive display and you're instantly able to collaborate, pull it up in multiple windows, address it in multiple formats, change a document, save it, email it, post it — whatever you want."

## ENDNOTES

1. "The Future of Jobs" from the World Economic Forum, <http://reports.weforum.org/future-of-jobs-2016/>
2. "From College to Life: Relevance and the Value of Higher Education" from Strada Education Network and Gallup, <http://www.stradaeducation.org/consumer-insights/relevance-and-higher-education/>
3. "The Future of Work and Learning in the Age of the 4th Industrial Revolution" from D2L, <https://www.d2l.com/en-eu/resources/assets/future-of-work/>
4. "U.S. Higher Ed Must Evolve Its Business Model," from the Huffington Post, [https://www.huffingtonpost.com/andre-dua/us-higher-ed-must-evolve\\_b\\_8978522.html](https://www.huffingtonpost.com/andre-dua/us-higher-ed-must-evolve_b_8978522.html)
5. "Pressure on the Provosts" from Inside Higher Education, <https://www.insidehighered.com/news/survey/pressure-provosts-2014-survey-chief-academic-officers>
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