Evaluation of Ivy Tech's Pathways to Information Technology: Early Implementation and Outcomes, Executive Summary

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November 2016

This workforce solution was funded by a grant awarded by the U.S. Department of Labor's Employment and Training Administration. The solution was created by the grantee and does not necessarily reflect the official position of the U.S. Department of Labor. The Department of Labor makes no guarantees, warranties, or assurances of any kind, express or implied, with respect to such information, including information on linked sites and including, but not limited to, accuracy of the information or its completeness, timelines, usefulness, adequacy, continued availability, or ownership.

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EXECUTIVE SUMMARY

In 2014, Ivy Tech Community College in Indiana received a $2.5 million US DOL TAACCCT grant to reform its computing and informatics programs to better prepare students for employment. Through the grant, Ivy Tech sought to reform these programs through several activities that promote greater alignment with workforce needs. These activities include the purchase of supplies to support hands-on learning; the professional development of faculty; the development of a student advising tool and student competitions; and the expansion of employer outreach and connections with the workforce system.

The Education and Employment Research Center (EERC) at Rutgers, The State University of New Jersey was hired to conduct a comprehensive evaluation of this TAACCCT grant-funded project, including implementation and outcomes analyses. The report that follows discusses early findings by: documenting progress in the implementation of the grant activities; identifying promising practices and areas for improvement; and providing baseline information on key data points of interest in areas where implementation is just beginning. The report also provides information on the characteristics of students who were enrolled in computing and informatics programs during the grant period and on their early outcomes.

Methods

The EERC evaluation team collected data from multiple sources including the following: site visits conducted at six Ivy Tech campuses in November and December 2015; interviews with central office staff; a review of program documents; and online surveys with all students enrolled in computing and informatics programs, including programs that had been redesigned under the grant and programs that had existed prior to the grant (conducted in February 2016), all students enrolled in the classes most likely to use new supplies purchased with grant funds, whether computing majors or nonmajors (conducted in February and March 2016), and all faculty involved in teaching computing classes (conducted in March 2016). The team also analyzed administrative records for computing students enrolled at the college from fall 2014 through fall 2015.

Background and Context

The TAACCCT grant reforms build on preexisting efforts to restructure Ivy Tech's computing and informatics programs around industry need. In fall 2014, the college changed its program offerings from four broad programs of study (computer information technology, computer information systems, information security, and computer science) to eight, more narrowly defined, programs of study (server administration, network infrastructure, database management, informatics, software development, information technology support, computer security information assurance, and computer science). These new programs comprise the new School of Computing and Informatics (CPIN).

Through the TAACCCT grant, Ivy Tech sought to support this program restructuring in several ways. First, the grant provided the new programs with new and upgraded supplies on many campuses, with which Ivy Tech staff sought to expand hands-on learning opportunities for its students. Installing new supplies also meant providing faculty with the professional development required to ensure that instructors would be adequately trained (and certified, when necessary) to use those supplies. The college also sought to improve advising for its CPIN programs by developing an online advising tool that would provide clearer information to guide students' pathways into these programs. In addition, college staff planned to increase employer-engagement activities by building advisory boards at the state and local levels and by strengthening existing relationships with employers, hoping to involve them in the new programs. Finally, staff members also sought to organize student competitions that would promote hands-on learning and employer engagement, as well as build stronger linkages with the workforce system.

Student Population

As of fall 2014, 8,485 students took at least one CPIN course. Of these CPIN course takers, 4,094 students officially declared a CPIN major (See Table 1). Overall, CPIN programs are primarily serving students who are in their 20s, male, and white. This population is demographically similar to the population of students who enrolled in the computing programs that existed prior to the reform. Among the eight new programs, those with the highest enrollments are software development, information technology support, and computer security information assurance.

Table 1. CPIN STUDENTS, FALL 2014—FALL 2015

	N
All CPIN students	8,485
Ever declared a CPIN major	4,094
Previous computing major	2,227
Not in a CPIN or previous computing major	2,164
Taking courses only	1,061
Undeclared major	45
Non-CPIN major	1,058

Source: Ivy Tech Student Administrative Records Data

Hands-on Learning

The TAACCCT grant provided the opportunity to make a significant investment in supplies for many of the Ivy Tech campuses. The supplies were allocated to campuses based on the statewide standards for CPIN program offerings with regard to their curriculum and learning objectives. Initially, some faculty members were unsure about the upgraded labs and data centers until they better understood the goals of their use, but overall the new supplies,

even at this early stage, has already had several observable positive effects on the quality of instruction.

The process for allocations varied by campus. Sometimes the amount of supplies a campus could receive was limited by space. On all campuses, facilities departments were involved in the allocations. Nearly all campuses that had new supplies hired a lab technician to help with the process of installation. While most supplies were substantially installed by fall 2015, some delays occurred that prevented full completion on all campuses even up to the time of this writing. On some campuses, for example, it was necessary to install raised floors, and in some circumstances, the college had to wait for approval from the US DOL to do this work in conjunction with the grant. On other campuses, delays occurred in the request-for-proposal (RFP) process as well as with other unforeseen issues.

Faculty received professional development training on how to set up the supplies. Some faculty reported that they would benefit from additional professional development focused on how to use the supplies to improve their instruction. In addition to professional development directly focused on the supplies, faculty were beginning to access professional development to complete industry certifications, which in many cases was required to enable instructors to teach classes using the supplies. Several faculty members reported feeling that completing these certification exams would help them better teach their students, though not all agreed that industry certifications would be useful to them.

New hands-on learning supplies have inspired changes to the CPIN program curriculum. Although it is still early in the implementation phase of the new supplies, the majority of faculty reported that the addition of the new supplies has already inspired some change in their instructional approach. Many had moved away from lecturing and the use of simulation to demonstrate how to do a task, toward having students accomplish tasks for themselves using the new supplies.

In addition, the new supplies allowed campuses to have local control of their computing network; previously, they had relied on the central campus network, which in many ways limited both what faculty could do and what they could allow their students to do. Having local network control allows faculty to install software as needed on their campuses, and to engage students in working with the network without fear of damaging critical campus systems. Some faculty reported that the one drawback of having local control is the extra time required to maintain the network.

While still early, faculty reported that the supplies—and the increased hands-on learning they allow—has presented several benefits for students. They reported that the supplies have improved the learning experience and increased student engagement in learning. They also reported that they have helped better prepare students for the workplace by providing hands-on experience in specific skills and by giving them greater confidence in their abilities. At some campuses, faculty reported that the new supplies have improved the social dynamics of the

program by providing a central meeting place. Some also hope that the new supplies will lead to increased student enrollments, but it is too early to tell if this has occurred.

Based on these findings, some recommendations for Ivy Tech to consider are as follows:

- More training for faculty should occur relative to the new supply allocations; training should focus on how to use the supplies and how to increase hands-on learning for students.
- Conversations about sustainability of supplies and hands-on learning in the classroom should begin.
- It might benefit campuses to have conversations as a consortium about how campuses could leverage funds to hire a lab tech to manage the CPIN networks on each campus.

Advising

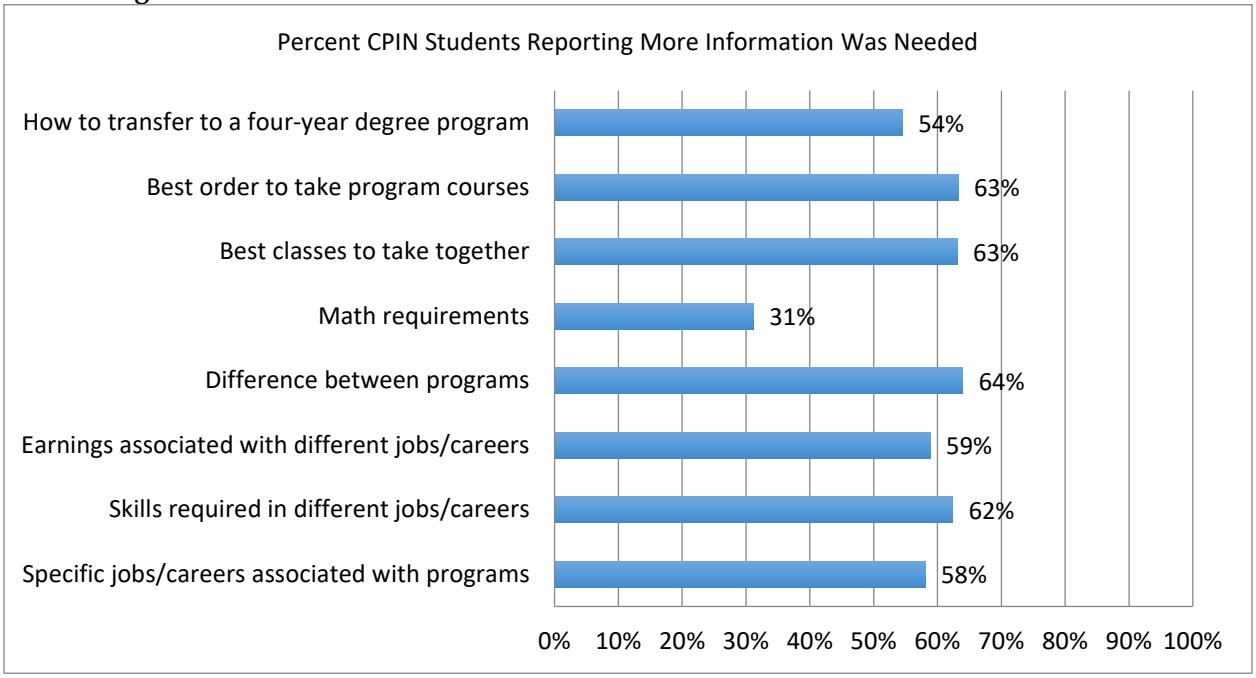
The recent expansion from four computing programs to eight CPIN programs has made advising more complicated and raised concerns about the current approach to advising at Ivy Tech. Currently, students see general advisors until they have completed at least 15 credit hours (on most campuses—though that number rises to 24 on two of the larger Ivy Tech campuses), at which point they then see faculty advisors.

The current advising model has faced new challenges to its ability to meet the needs of students since the launch of the eight new CPIN programs. Two main problems arise from this model with regard to advising prospective CPIN students. First, general advisors do not know enough yet about the individual CPIN programs to guide students, including the nuanced differences between the programs or how the course requirements within the programs fit together. Second, general advisors tend to take a more exploratory, holistic approach to advising; they are reluctant to discourage students from pursuing any particular field regardless of their demonstrated aptitude. Although some students report having a positive experience with general advising, many students are unsatisfied with their experiences. In contrast, faculty advisors know more about the specific CPIN programs, and they are more likely to directly steer students away from certain programs—or from computing as a whole—based on more informal, though often very direct, assessments of students' interest in, aptitude for, and skills ability relative to CPIN programs. Students in focus groups tended to be satisfied with their experiences with faculty advisors and highly recommend faculty advising. However, given faculty's existing heavy teaching workloads, it is not clear that they would be able to handle an increase in the number of students to advise.

Students lack the information they need to choose their program and career pathways. When selecting a program of study, CPIN students reported they needed more information on both the programs available to them and their requirements as well as the job market(s) to which those programs provided a pathway (See Figure 1). There was also some disconnect between the perceptions of students and faculty with regard to certain types of information. For

example, students often reported that math requirements were not a concern for them in selecting a program, but faculty expressed concern about their students' math ability.

Figure 1. STUDENT INFORMATION NEEDS UPON PROGRAM SELECTION.



Source: CPIN student survey

Students used a variety of information sources to find out about programs and their requirements and to learn about careers; the sources they consulted most often were the Ivy Tech website (for programs and courses) and other online resources (for careers). Many students used these resources to self-advise, which both faculty and general advisors discourage. It is for this reason that both types of advisors expressed concerns about making an online advising tool directly available to students. Though the development of an advising tool is positively viewed by faculty and advisors, they view the prospective tool as being a helpful resource to support their own work, rather than an adequate replacement for the face-to-face services they provide students.

Based on the above findings, some recommendations for Ivy Tech to consider are as follows:

- Faculty members should share with general advisors the "informal assessment" process they use with students. This series of questions faculty ask students to help them choose a program may be helpful to share with general advisors and to build into the advising tool.

- All course lists and campus marketing materials should be fully updated to reflect the transition to the eight program pathways—this will help eliminate confusion for incoming students interested in CPIN programs.

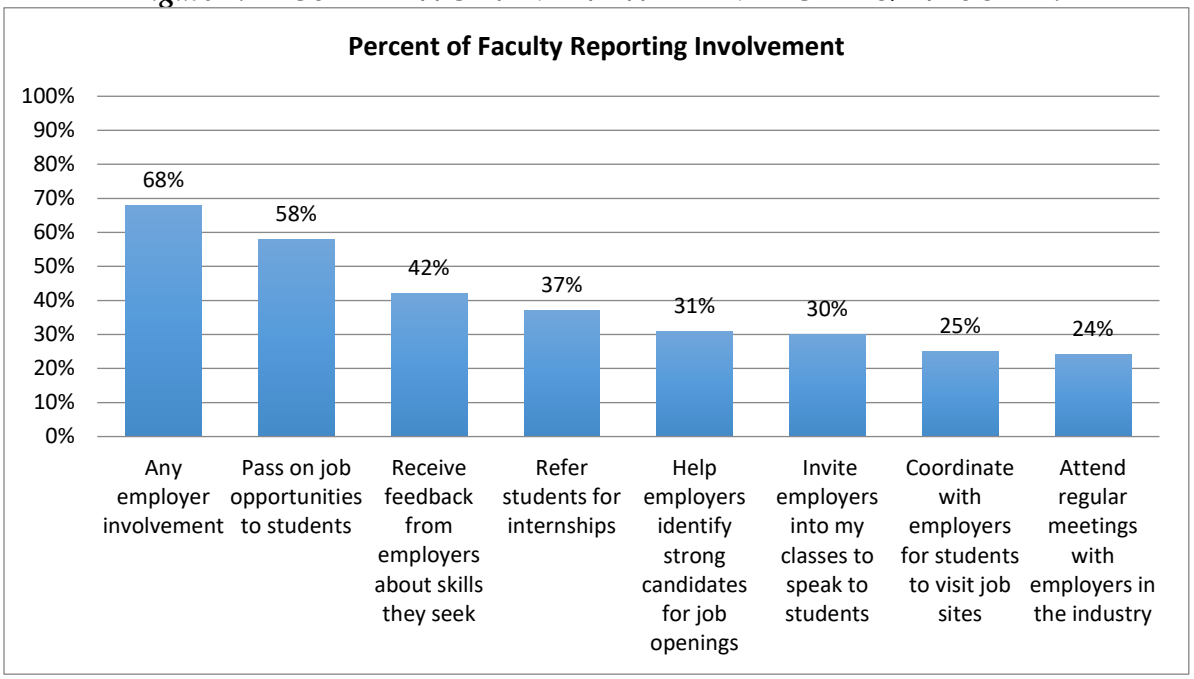
- More career information should be made available to students. Students expressed a desire for more information about career pathways, jobs, earnings, and necessary skills despite faculty members' sense that they are adequately presenting this material. The online advising tool may have a role in filling this need.

- Conversations should occur at the level of central staff to reassess the advising model for CPIN students in terms of how to integrate the online advising tool and the role of general advisors and faculty advisors.

Employer Engagement

College staff and faculty viewed employer engagement as an opportunity to expand the reputation of their programs and to help students set and achieve their employment goals. While faculty members value employer engagement, they struggle to find time to build connections. Faculty have not consistently reached out to industry despite their interest in doing so—while some faculty have made very intensive efforts to reach out, others have been more passive, waiting for industry to contact them (See Figure 2). Traditionally, faculty have not been responsible for conducting employer outreach as part of their role at the college. As a result, these efforts are at the discretion of the faculty member and are limited by very real constraints on faculty members' time. Furthermore, employer engagement as it is currently done relies on personal connections and is not coordinated across the college.

Figure 2. FACULTY INVOLVEMENT WITH EMPLOYERS/INDUSTRY.

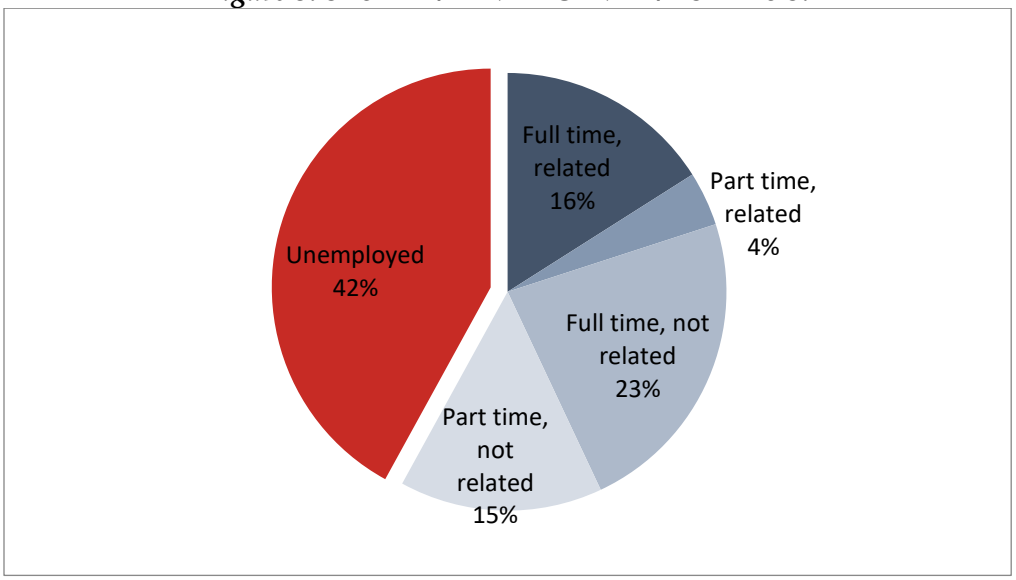


Source: Ivy Tech faculty survey

Faculty members welcomed the development of advisory boards on their local campuses because of their interest in learning about employer skills needs and involving employers in their programs. As they moved to develop these relationships, however, some faculty were concerned that their campuses might not be able to effectively respond to local employers' needs because of the restrictions they faced with regard to any changes to the statewide curriculum that such a response might require.

Faculty also saw internships as an important way employer engagement could help students bridge the connection between school and work. Despite faculty interest, however, many students reported they were not interested in completing internships. The lack of interest among students was largely due to the fact that many already work—and of those who are employed, many already work in jobs related to their field of study (See Figure 3). Still, many students would benefit from an internship, and to this end, faculty and college staff reported that a more formalized process for structuring and supporting internships would be helpful.

Figure 3. STUDENT EMPLOYMENT STATUS.



Source: CPIN student survey

In general, faculty indicated they have limited involvement in student job placement. They are far more likely to share job postings with students than to engage in a more active matching process between students and employers. However, many faculty expressed a desire to learn more about employers' needs so they would be better able to prepare students for jobs.

Other activities that some faculty mentioned as useful ways to engage employers in CPIN programs included involving them in project-based learning, inviting them to visit classes as guest lecturers or to conduct mock interviews, bringing students on tours of their facilities, and supporting faculty worksite visits and internships. None of these activities are widespread, but each offers a promising idea that may be shared across the campuses.

Based on these findings, some recommendations for Ivy Tech to consider are as follows:

- Encourage coordination in contacting employers within and across campuses to better leverage existing outreach efforts and develop more structure and institutional support for employer outreach.

- Consider ways to structure the work of employer engagement into the activities of the college, such as by building time into the workload of faculty for employer outreach.

- Share promising practices on how to run advisory board meetings and how to engage employers in additional activities.

- Develop structured guidelines for internships that build on existing models currently in use within the state.

- Consider approaches to recognizing and building on the work experiences of students who are employed in jobs related to their program.

Early Outcomes

These analyses of early outcomes focus on retention at the college for students who first enrolled in Ivy Tech as of fall 2014 and were enrolled in a CPIN program. For these students, initial (fall-to-spring) retention is high, but retention declines substantially by fall 2015. Over 72 percent of CPIN students who enrolled in fall 2014 were retained in spring 2015, but by fall 2015, less than half of those fall 2014 enrollees (45 percent) were still enrolled. Retention rates vary across CPIN programs, and are lower for black students than white and Hispanic students, raising questions for further examination. The results are purely descriptive; they do not account for prior retention patterns among subgroups of students, and no comparisons are made to similar groups of students. Future reporting will include comparison groups of students, as well as additional outcomes once more follow-up data are available.

Next Steps

In the coming year, Ivy Tech will continue to implement TAACCCT grant activities with a continued focus on the goals discussed here. With the installation of supplies nearly complete, grant activities will now primarily focus on encouraging the use of these supplies through expanded hands-on learning and on continued professional development. A great deal of activity is also planned for the advising tool and expanded employer engagement. The advising tool is being further developed, and plans for its rollout to advisors, and eventually to students, are being discussed. Employer-engagement activities with both the statewide advisory board and the local campus advisory boards are ongoing, as is the expansion of other types of involvement with employers. In addition, student competitions are planned with the dual goals of providing additional hands-on learning activities to students around the state and creating

another avenue for employer engagement. The EERC team will continue to examine and evaluate the implementation of these activities.

As more students move through the new CPIN programs, EERC's evaluation will focus more intensely on examining student outcomes to assess the impact of the grant reforms on CPIN students. Using quasi-experimental methods, the evaluation will designate comparison groups of former computing students at Ivy Tech as well as students from other comparable programs. Future reports will provide insights on the impacts of the grant activities on students' retention and completion rates as well as their employment outcomes.