



RUTGERS EDUCATION AND EMPLOYMENT RESEARCH CENTER

**STUDENT DECISION MAKING ABOUT
COMMUNITY COLLEGE
INFORMATION TECHNOLOGY
PROGRAMS AND CAREERS**

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**Student Decision Making About
Community College Information Technology Programs and Careers**

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Executive Summary

Students in Ivy Tech's Information Technology (IT) programs, like other community college and technical students nationally, have multiple career pathways available to them. While these choices offer opportunity, they also create a confusing array of options they must navigate. Understanding how students make decisions about their education and career is imperative to offering better institutional support and resources. Our analysis of a survey of 539 first-semester students fielded in Fall 2018 and Spring and Fall of 2019 reveals several key findings related to student decision making in career and technical programs. First, respondents indicated that, while they are interested in transferring to a four-year university, their immediate educational goals were focused on earning industry certifications and an associate degree. This implies that students were interested in pursuing work prior to continuing their education. However, we also find that respondents were not aware of all the IT program options available to them. Students were most aware of opportunities to pursue computer science and cybersecurity, followed by software development and informatics programs. Students were least aware of programs and career pathways related to network infrastructure, server administration, and visual communication. Students also lacked awareness of the full range of transfer options available to them and were not aware that all the IT programs are transferable. Of students who had changed their program of study from one IT program to another, 42 percent had previously been enrolled in computer science, indicating computer science may not be the best program fit for some students. A key issue for students is raising awareness regarding math requirements in IT programs. Many students were not aware of the math requirements for each program, but over half of respondents indicated those requirements are important to know. While most respondents had selected a program of study prior to completing the survey, only about half had made decisions about a career, indicating students may still have had some confusion or uncertainty about how their program intersects with various career paths. To inform their decisions, students receive most of their program information from their institutional website and, to a lesser degree, general advisors. These insights about community college students' decision-making processes related to IT programs and careers offer insights to colleges to better help support students by providing more information on relevant topics early on and reaching students through online resources.

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Background

A skilled technical workforce is essential to the health of the American economy (National Science Board, 2019). Building this workforce rests on helping more students make informed decisions about educational programs and career paths in technical fields. Yet, little is known about this process. How—and how early—students make decisions about programs and careers has important implications for students' success in school and in the labor market. For example, research indicates that completion outcomes are better among students who settle on a program of study sooner rather than later in the course of their studies (Jenkins & Cho, 2014). The sooner colleges are able to effectively guide students to choose a pathway, the earlier students will be able to focus their attention on fulfilling the requirements they need to complete that program.

For students interested in technical fields, these decisions are of particular importance due to the relatively high number of requirements needed to complete technical programs at most colleges. Further, deciding on a program early may help students reach better labor market outcomes as they clarify their career interests and are able to focus on the pursuit of an end goal they care about (Stuart, Rios-Aguilar, & Deil-Amen, 2014). To understand how to best support students along the educational path that will lead them to their chosen careers, it is important to understand the decision-making processes they engage in along the way (Fishman, 2015; Pryor et al., 2012). This paper shares early findings from research on student decision making about community college Information Technology (IT) programs to inform colleges and educators who seek to develop strategies to support student decision making about programs and careers in technical fields.

The Role of Colleges in Student Decision Making

Colleges can have an important influence on student decision making. The institutional context in which decisions occur creates a choice architecture—a set of structures that guide student decision making and influence their success (Scott-Clayton, 2011). How colleges organize their programs of study and then communicate information to students about them can have an important impact on students' success, particularly those in career and technical programs (Hirschy, Bremer, & Castellano, 2011; Van Noy, Trimble, Jenkins, Barnett, & Wachen, 2016). Institutional structures such as advising availability and requirements as well as programmatic structural elements such as introductory course requirements can shape decisions and ultimately affect how students progress through their educational pathways.

How colleges present information and provide advising can be important influences on students' decision making. Prior research on community college technical programs identified the importance of students' access to quality information and active advising and support (Van Noy et al., 2016). Access to information relates to how and whether the information necessary to make good decisions about courses and program requirements is conveyed to students. Informational resources on programs of study are often inconsistent, poorly organized, or unavailable, causing students to become confused when attempting to navigate decisions in college (Nodine, Jaeger, Venezia, & Bracco, 2012; Jaggars & Fletcher, 2014; Deil-Amen & Rosenbaum, 2003; Rosenbaum, Deil-Amen, & Person, 2006). Colleges today are offering an increasingly wide range of online resources intended to support student decision making (Karp, Kalamkarian, Klempin, & Fletcher, 2016).

Decision Making and IT Programs

With the general awareness of favorable job prospects in the field, IT stands out as an attractive choice to many community college students. However, the many subfields that fall under the IT umbrella can create confusion among IT students regarding program requirements and employment opportunities. In addition to selecting from among the available programs, students within individual programs must make more fine-grained decisions about which credential(s) to pursue. Options generally include a range of short-term technical certificates tied to career pathways that will help students secure immediate employment while they pursue additional education. There are many ways to potentially stack or embed several of these credentials along a career pathway. Students may also consider a transfer-oriented associate degree that leads directly to a traditional four-year program. The IT field is dynamic and broad in scope, and potential IT students can have difficulty reconciling their career goals with the multiple academic pathways available to them.

Existing research on student decision making in the context of IT fields in four-year colleges highlights concerns about students' limited knowledge of IT careers. In the context of four-year IT programs, two studies used a social cognitive career theory framework to identify factors that affect students' decisions to major in an IT field. These factors include self-efficacy, outcome expectations, interest, and choice goals (Akbulut & Looney, 2007) as well as the role of perceived social support of major choice by family, friends, advisors, peers, and other important individuals in the student's environment (Akbulut-Bailey, 2012). Another study examined knowledge of different IT programs among a broad group of students, including students enrolled in IT programs, and found that many did not understand the distinctions between the

various programs (Courte & Bishop-Clark, 2009). Others have shown that students' perceptions of the IT field are distorted, leading them to make choices based on inaccurate information and to rely on myths about the field and the state of the industry (Granger, Dick, Jacobson, & Van Slyke, 2007). A 2005 study found that students have poor advising both before and during college, leaving them ill-informed about what the computer science field demands in terms of skills and academic preparation (Beaubouef & Mason, 2005). For instance, when students are advised to pursue their interests in computers, they are often not advised to take advanced math in high school, even though math and its associated logic and critical thinking skills are a prerequisite for many computer-related programs. Additionally, students who are informed of the higher-level math requirements associated with computer science may self-select out of IT, incorrectly believing that higher-level math is required for all IT programs when in fact it is not.

It is likely that similar challenges are faced by students in two-year colleges, especially those in technical programs. Given that such programs are designed to be completed in a short period of time, these students have even less time for exploration before choosing a program. Further, community college technician programs, many of which are designed to accumulate or stack educational credentials, often have the dual goals of preparing students for immediate entry for work as well as for continued pursuit of education (Bragg & Krismer, 2016; Center for Law and Social Policy, 2014). These dual goals are central to the associated career pathways and may support or challenge students' career exploration processes. Close linkages to the workforce among these programs may help students connect their coursework to careers and encourage them to begin to explore their career interests. Externships and internships can provide real value in helping students clarify their decisions. In addition, they can help

programs stay abreast of new types of IT jobs and add career pathways for students. For example, jobs in social media are new to the IT field but are a viable career for many students. Yet, programs in IT fields are often tightly structured in terms of course requirements, potentially leaving little time for exploration before selecting a program pathway (Van Noy et al., 2016). At what point students meet with advisors and how programs structure that advising can influence the choices students make in ways that could significantly impact the gender and racial/ethnic diversity of students who enter online IT programs and technician careers (Katz, Allbritton, Aronis, Wilson, & Soffa, 2006; Varma & Hahn, 2007).

IT Programs at Ivy Tech

Ivy Tech Community College's IT programs have similar general characteristics, so it provides a good case in which to examine these issues. As Indiana's primary two-year college, with over 40 locations within the state, the college has nine programs of study in IT. Over the last several years, the college has worked to align its programs with labor market needs and to improve the clarity of program pathways for students. Especially within the School of Information Technology, the college has made a concerted effort to streamline students' program options and align programs with careers.

In 2014, the school went from offering four broad IT programs to nine focused career-specific programs. A 2014 Trade Adjustment Assistance Community College Career Training (TAACCCT) grant further enabled the school to align programs with the labor market by providing funding for equipment and supplies as well as building out lab space. The program redesign created options intended to lead to better employment outcomes, but in doing so, it also increased the need for improved information sharing and advising. Throughout the grant

period and over subsequent years, Ivy Tech focused considerable effort on restructuring its advising protocols to address this need. Its advising redesign has centered on combining the efforts of advisors and faculty to provide students with detailed program and career information to help them choose the proper path for themselves.

Like many community college IT programs, each of Ivy Tech's programs is highly structured, with required courses that must be taken in the correct order to align with the right prerequisites. Successfully completing course requirements thus requires intentional scheduling, as failing to take courses in the proper order could delay completion. These challenges are not unique to Ivy Tech; community colleges nationally are grappling with how to offer career pathways and ensure students have the ability to choose the correct path for themselves early enough to avoid or minimize delays. Colleges with IT programs must also maintain enough flexibility to create these pathways while staying relevant in a rapidly changing field.

In recent years, Ivy Tech's curriculum committees have rolled out a sequencing of courses meant to help alleviate these issues, which includes a primarily common first semester across the programs. Students are encouraged to take a core set of introductory courses before moving on to 200-level courses, which are program-specific. The core courses are meant to help students understand all IT program options and career paths, as well as program-specific requirements. While the curriculum aligns, advising variance across campuses and programs can lead to instances where students may not be taking the core courses up front.

Methods

This paper focuses on the following research question: “What experiences and information influence students’ decision making about programs and careers in IT?” It also explores the institutional role in student decision making by examining what information students receive from advising and how their experiences with advisors, faculty, and introductory courses influence their decision making about programs and careers. Specifically, the research focuses on determining what information students seek about potential programs and careers, and where they look for that information.

This paper reports on survey findings from first-semester students in Ivy Tech’s School of Information and Technology programs. Survey results and findings illuminate the role institutions play in student decision making and reveal how institutional factors impact how students make decisions about programs of study and IT careers. The survey was distributed to students enrolled in key IT courses at Ivy Tech Community College during the 2018–19 academic year. The survey was distributed electronically via Qualtrics to three groups: 1) students in first- and third-semester courses in the Fall 2018 term (December), 2) students in first- and third-semester courses in the Spring 2019 term (February), and 3) students in first- and third- semester courses in the Fall 2019 term. Faculty members teaching in-person versions of IT courses identified as courses that were likely to be taken by students in their first or third semesters were asked to share the survey link with their class during regularly scheduled class times. The survey was made available to 2,942 students, and 690 students took the survey (response rate: 23%). After terminating survey collection, responses were restricted to students who took the survey in courses most likely to be taken during their first semester to control for

differences in the status of their decision making based on their experience with the program. A total of 539 students took the survey in courses most likely to be taken during their first semester.

Demographically, survey respondents were typical of the larger IT population at Ivy Tech. Respondents were 69 percent male and 71 percent white. Just over half (56%) were attending Ivy Tech full time, and just under half (43%) were attending part time. Like the larger population of IT students, the respondents varied in the amount of education they had received previously. The majority—69 percent—had a high school diploma upon enrolling at Ivy Tech, 5 percent had neither finished high school nor received a GED, 6 percent had a GED, 10 percent had an associate degree, 7 percent had a bachelor's degree, and 2 percent had a graduate degree.

Respondents were asked to respond to open- and closed-ended prompts detailing their experiences with general and faculty advising; their awareness of IT programs, math requirements, and transfer; and how they make decisions about their education and career pathway. Closed-ended survey results were analyzed through Qualtrics, and open-ended answers were uploaded to NVivo qualitative data management software and coded for themes and categories.

Findings

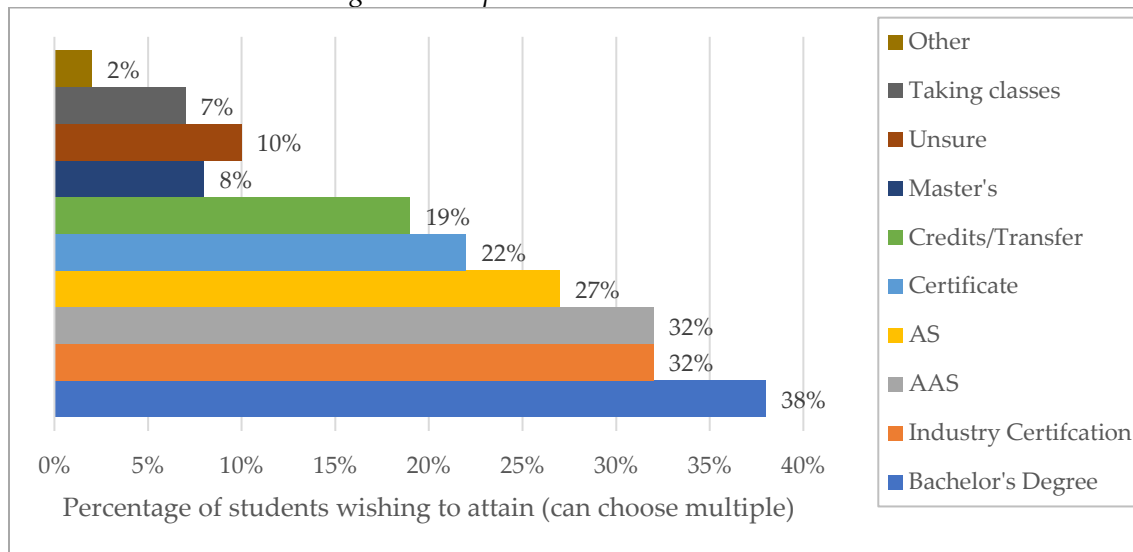
The survey yielded insights in a few key areas on student decision making about programs and careers. We begin by discussing students' educational goals to provide context on what they sought from their Ivy Tech education. We then discuss findings on their experiences related to program selection and career selection. Getting into further detail about

their engagement at Ivy Tech, we discuss findings on their experiences with course selection and early course taking, as well as with advising. We conclude with a discussion of students' remaining information needs related to IT programs and careers.

Educational Goals

Overall, students reported numerous educational goals. Among current educational goals, transfer was the most common response (57%), either through a bachelor's degree (38%) or earning credits to transfer to another college (19%). Nearly one-third of respondents (32%) said they were pursuing an industry certification, commonly viewed as a beneficial workforce credential. Associate degrees (32%) and applied associate degrees (27%) were also common goals among respondents. See Figure 1.

Figure 1: Respondents' Educational Goals



Source: EERC Ivy Tech 2018–19 Student Decision Making Survey

Students' responses were mixed on whether they held one goal or multiple goals for their education. Just over half of students reported they had multiple goals (53%), likely reflecting a desire to pursue a career pathway including work as well as continued education.

The most common combination of goals combined an industry certification and an associate degree (44% of those reporting multiple goals). The next-most-common set of goals combined an industry certification, a bachelor's degree, and either an associate degree or the accumulation of credits to transfer to a four-year university (19% of those reporting multiple goals). These findings suggest that many students enroll in IT programs at two-year colleges looking to work for a time, then return to school later to pursue a bachelor's degree. Of the 47 percent of students who reported having only one educational goal, it was most often an associate degree (36% of students with one goal), followed by a bachelor's degree (28% of students with one goal). Interestingly, only 8 percent of students reported having an industry certification as their only goal, indicating that most students view a workforce certification as only part of their educational journey, not as an end to it. Only 12 percent of students with one goal reported being completely undecided about their educational goals, indicating that most respondents have some sense of their educational goals even early in their education.

Broadly, respondents indicated a high interest in transfer. Nearly three-quarters of respondents (72%) reported they were either interested or extremely interested in transferring to receive a bachelor's degree in the future. This is typical of community college students nationally; historically speaking, bachelor's degree attainment has been a goal for 50 to 80 percent of first-time community college students (Handel & Williams, 2011; Horn, 2009; Horn & Skomsvold, 2011; Provasnik & Planty, 2008).

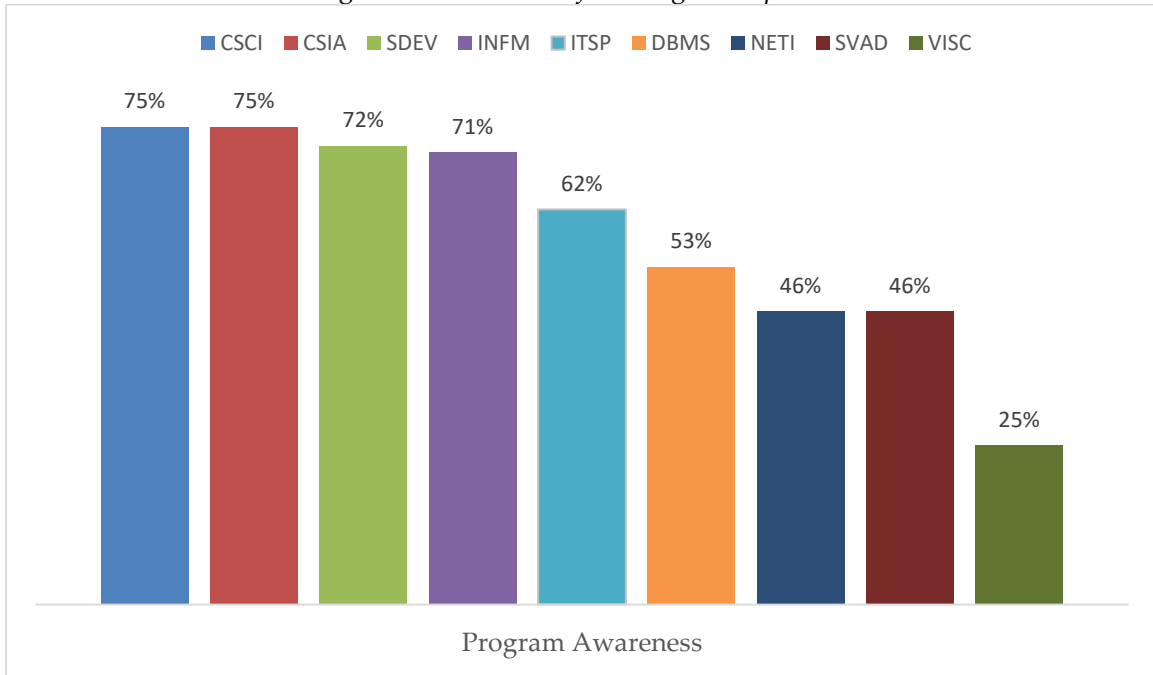
Program Selection

Choosing among IT programs can be a challenge for some students who lack awareness of the options available to them. Most students (84%) surveyed were at a point in their

enrollment where they had chosen a program. Many, however, had switched programs during their time at the college. For about one in five respondents (20%), the IT program in which they were enrolled at the time they were surveyed was not the first program in which they had enrolled at the college; they had switched from one program to another. Of those who had switched, most of them had come from programs outside of IT (64%). Of those who had enrolled previously in an IT program, 42 percent had previously enrolled in computer science. Students may be enrolling in computer science because of a lack of information about other program options and a common perception among students and some advisors alike that computer science is the chief option for anyone with an interest in computers.

To understand how much students know about the possible choices of IT programs available to them, respondents were asked which of Ivy Tech's nine current IT programs they were aware of. Computer science (CSCI) and cybersecurity (CSIA) were the best-known IT programs, with roughly the same number of students—75 percent—recognizing these programs. Software development (SDEV) was next, with 72 percent awareness, followed by informatics (INFM) with 71 percent awareness. Over half of students were aware of the school's IT support (ITSP—62%) and database management (DBMS—53%) programs. The network infrastructure (NETI) and server administration programs (SVAD) had lower awareness levels (46%), and students were least likely to be aware of the school's program in visual communications (VISC—25% awareness). Since visual communications is the newest addition to the school of IT, the relatively low awareness level is not surprising. These results replicate a previous survey conducted during a TAACCCT grant that funded IT programs (Edwards et al., 2018), suggesting that students remain unaware of all the IT program options available to them.

Figure 2: Awareness of IT Program Options¹



Source: EERC Ivy Tech 2018–19 Student Decision Making Survey

Leading to further confusion, computer science is a program students and advisors are aware of beginning in or even before high school, and the term “computer science” is often used to represent an array of IT courses that turn out to be highly differentiated at the collegiate level. Students, being unaware of other program options, may therefore seek out a computer science program because they think it represents courses they took in high school. Similarly, general advisors may place students into computer science programs without fully understanding the program options available within the realm of IT. This direction of students into computer science programs is problematic because computer science programs tend to be transfer-oriented, include general education requirements, and require higher level (calculus-based) mathematics. Since other IT programs only require algebra and do not require general

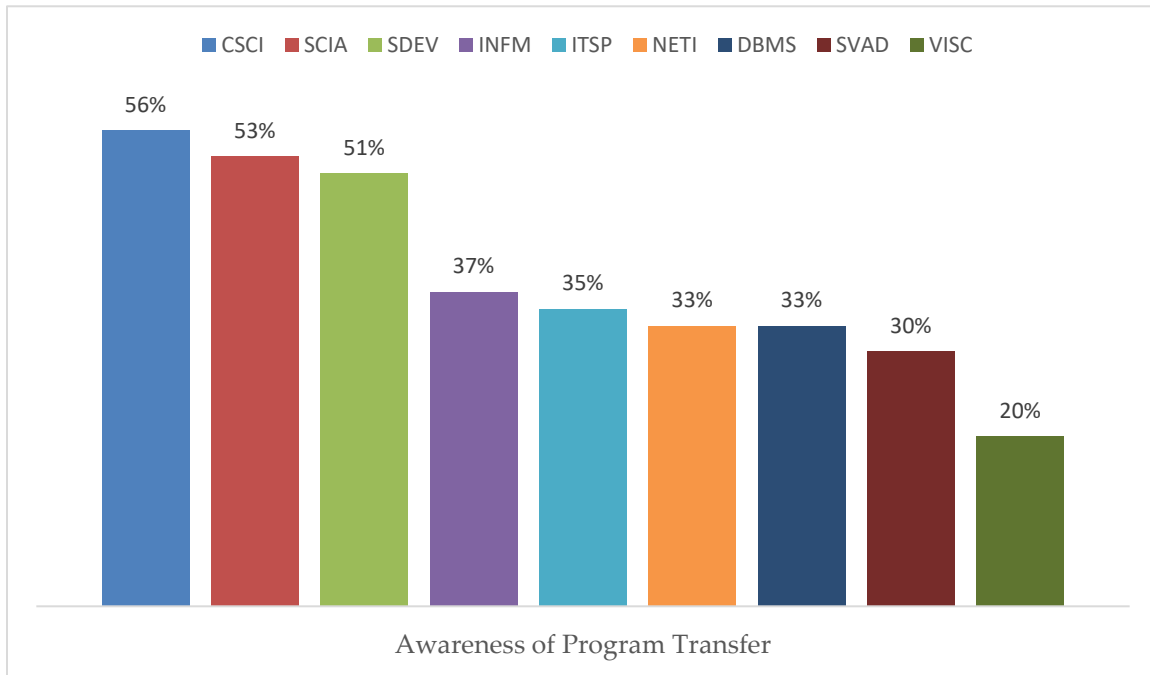
¹ CSCI=Computer Science, CSIA=Cyber Security and Information Assurance, SDEV=Software Development, INFM=Informatics, ITSP=Information Technology Support, DBMS=Database Management Systems, NETI=Network Infrastructure, SVAD=Server Administration, VISC=Visual Communications

education credits, enrolling in computer science can place students on a more complicated and challenging pathway than is necessary to reach their educational or career goals. This can result in students switching programs or dropping out before completion because they are academically unprepared to take general education requirements or calculus, or because they lose interest. Another reason students may enroll in computer science unnecessarily is because they do not realize they do not need an associate degree in order to transfer to a four-year program; the school offers several nontraditional transfer routes launching from the AAS degrees offered in other IT programs. Students who begin a computer science program by taking general education courses they do not need, only to switch programs at a later date, face unnecessary delays in time to completion.

Misinformation about transfer may be occurring among this group of students. Students who chose an associate degree as an education goal were also more likely to choose a bachelor's degree as a goal or at least indicate they were taking classes to transfer to a four-year university (18% of all students) than those who chose an AAS (12% of all students). Respondents on an associate-degree path were more likely than those in an AAS-degree path to also be considering transfer, which indicates that students may be receiving misinformation about their ability to transfer with an AAS degree. In addition, when students were asked which programs they thought would transfer to a four-year university, most students chose computer science (56%, see Figure 3). Most respondents were also more aware of traditional transfer pathways (30%) than they were of pathways that allow for AAS transfer. For example, student awareness of transfer pathways to Western Governor's University (13%) and Trine University (9%), two institutions with Ivy Tech AAS articulation agreements, were relatively low comparatively. This

highlights the need to help students initially enroll in programs that are a good match for them and to ensure students are receiving accurate information about transfer pathways.

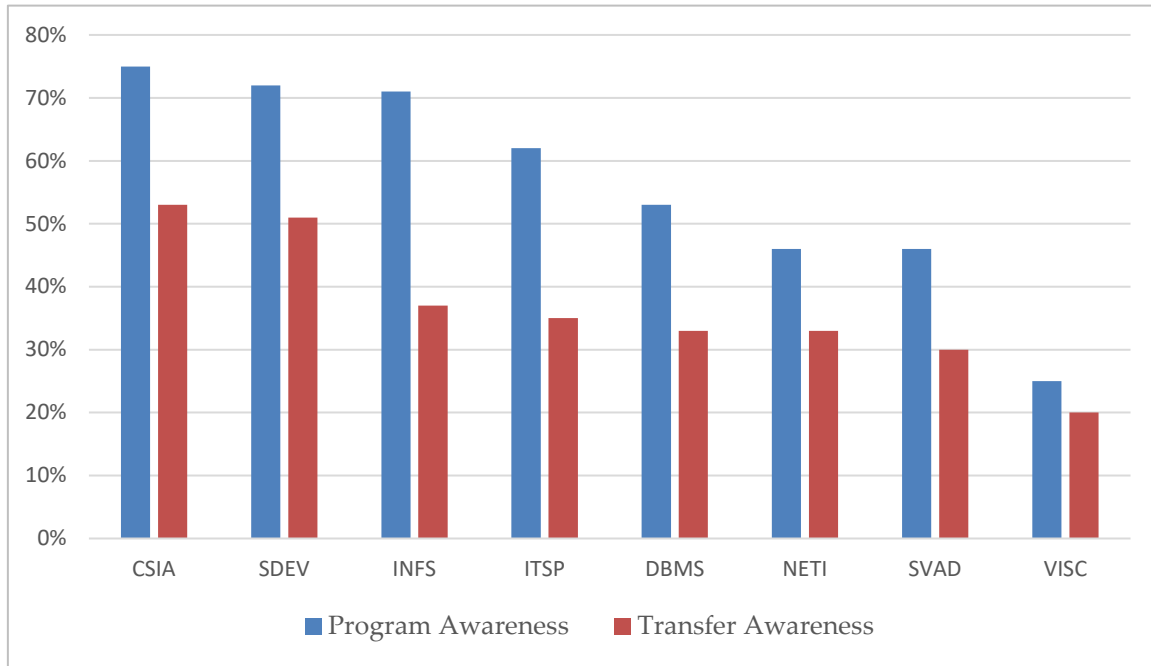
Figure 3: Awareness of Which Programs Transfer



Source: EERC Ivy Tech 2018–19 Student Decision Making Survey

It was also clear that students' awareness of which programs would transfer roughly mirrored their general awareness and knowledge about the programs (see Figure 4). Of students who were aware of any given program, some of those students were also aware it would transfer. In all cases, however, students' general awareness of a program was higher than their awareness of its ability to transfer, indicating that the information most students receive about programs is not complete.

Figure 4: General Awareness of Programs as Compared to Transfer Awareness

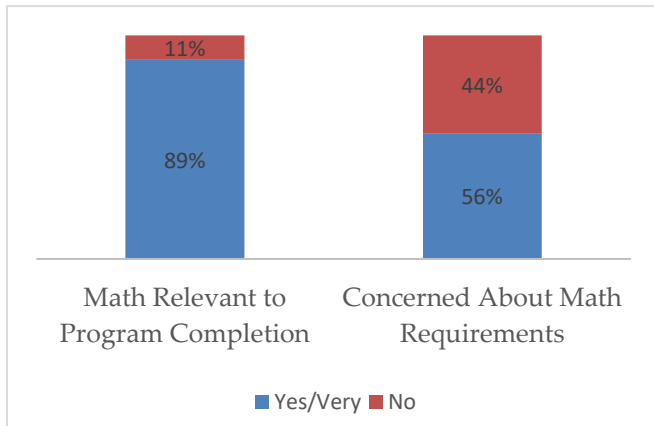


Source: EERC Ivy Tech 2018-19 Student Decision Making Survey

Course requirements were universally important to students in selecting a program. Nearly all respondents (96%) indicated course requirements were important or very important to them when they were choosing a program. Among course requirements, math requirements are instrumental in IT program success. Students recognize this, with 89 percent of respondents indicating math was relevant or very relevant to IT program completion. Over half of respondents (56%) were concerned about the math requirements for their program (see Figure 5). However, nearly a third (33%) indicated they either did not know the math requirements for their program (16%) or were unsure if they knew them at the time of program selection (17%) (Figure 6). Almost a quarter (22%) were unsure if they would have to take developmental math (a sequence of math courses designed to prepare students for transfer-level college mathematics), further indicating some students' confusion over math requirements. This

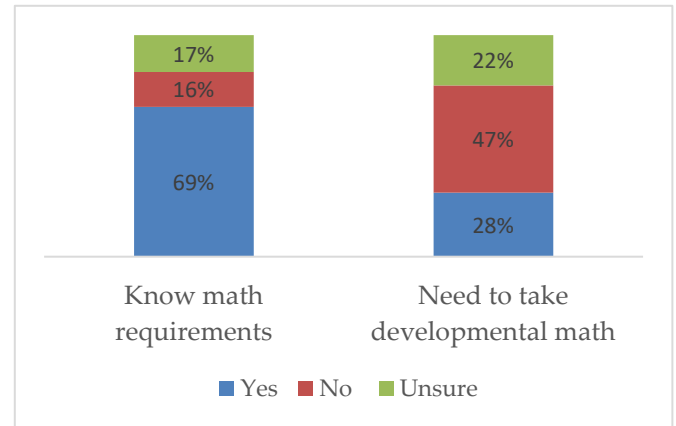
information suggests although nearly all respondents were highly concerned about their course requirements, many remained unsure of their math requirements—one of the most important factors in completing an IT program

Figure 5: Math Relevance and Concern



Source: EERC Ivy Tech Student Decision Making Survey

Figure 6: Knowledge of Math Requirements

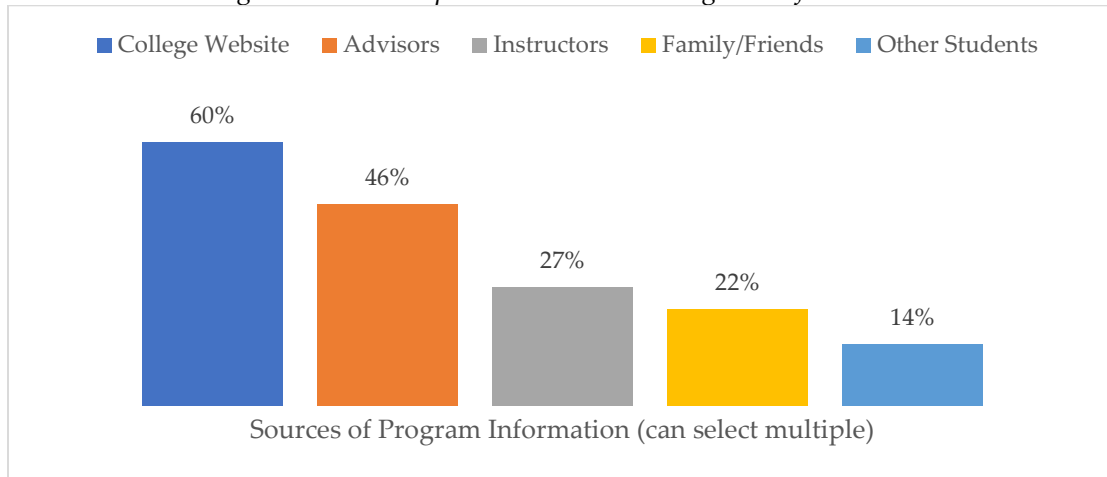


Source: EERC Ivy Tech Student Decision Making Survey

Students used a variety of information sources to help guide their choices about IT programs. As evident in Figure 7, respondents received information about program options primarily from the Ivy Tech website (60%) and advisors (46%). To a lesser degree, students received information from instructors (27%), family and friends (22%), and other students (14%). Since most students are getting their information directly from the institution, this highlights an institutional opportunity to help students receive more complete information. These findings highlight the important role of the college website and advisors and underscore the benefits of colleges’ documented efforts to offer an increasingly broad range of online resources to help students with decision making (Karp et al., 2016). It is important to note, however, that information on the full range of programs is available on Ivy Tech’s website, including informational videos describing these options. Yet, based on the number of survey

respondents who were unaware of the range of program options available to them (see Figure 1), students do not appear to be utilizing that resource fully or effectively. With this finding in mind, colleges may examine ways to improve their website information, offer additional online resources, prompt more students to see advisors, and consider innovative ways to convey information that would help guide students' program choices.

Figure 6: How Respondents Received Program Information



Source: EERC Ivy Tech 2018–19 Student Decision Making Survey

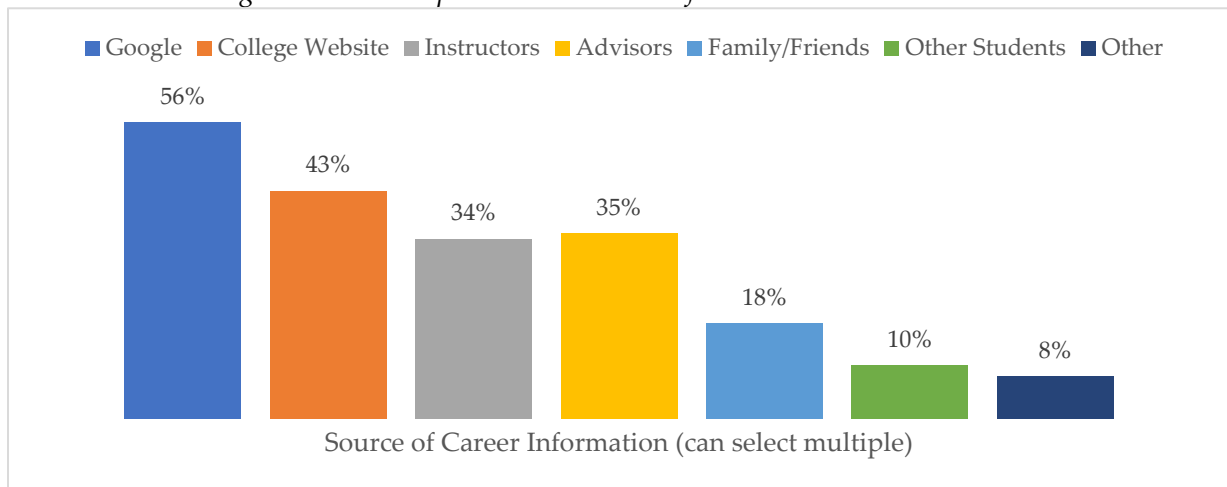
Career Selection

While students were selecting a program, they were still figuring out their eventual career path. Just over half of respondents (51%) said they had chosen a career at the time of the survey, while just under half (49%) had not. This indicates that many students remain unsure of what IT career they want to enter even after choosing a program.

Students were asked to “select all” sources they used to seek information about what education programs lead to their desired careers. Figure 8 shows that survey respondents relied mostly on electronic sources when searching for information about career paths—Google (56%) and the Ivy Tech website (43%) were the most-often cited sources of information. Instructors (34%) and advisors (35%) were the next-most-popular sources of information, followed by

family and friends (18%), other students (10%), and, finally, other sources, including Ivy Tech marketing material such as brochures and posters, classes, and school events (8%). Although Google received the most individual responses, institutional sources also ranked quite high, indicating the role the institution has in providing students with information about career paths.

Figure 7: How Respondents Received Information on Career Paths



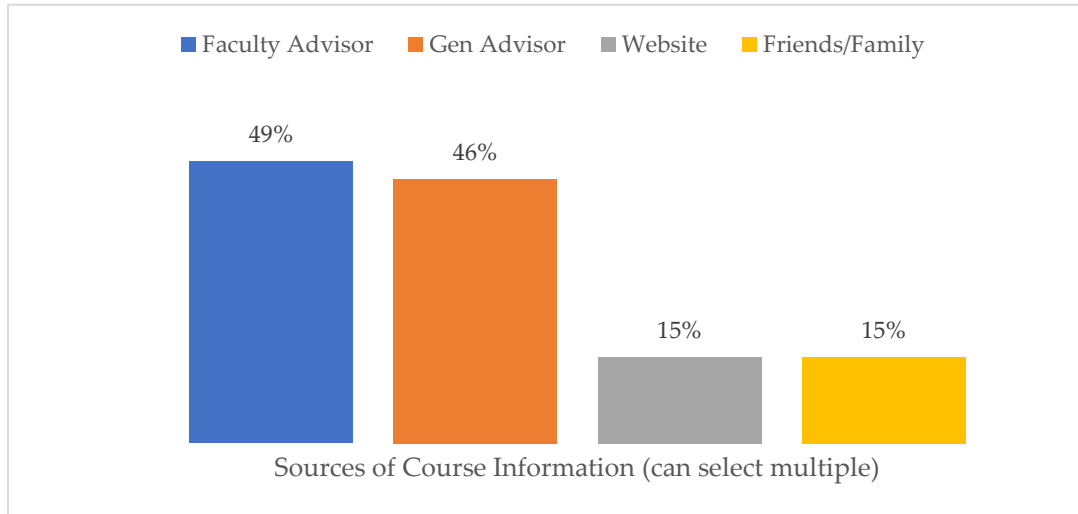
Source: EERC Ivy Tech 2018–19 Student Decision Making Survey

Course Selection and Early Course Taking

Courses are essential experiences for students in college and can play an important role in their decision-making processes. Once in a program, or even while still deciding on a program, students make decisions about which courses to take. Students were asked to indicate which resources they used to choose their courses, and again, respondents reported that institutional sources played a strong role in influencing those decisions. Nearly half of students (49%) relied on faculty advisors, and 46 percent relied on general advisors, when choosing courses (Figure 9). Whereas Figure 8 revealed that students relied most heavily on electronic sources (Google and the school website) to gather career path information, when confronted

with choosing which courses to take, more students relied on instructors and general advisors to help them navigate those decisions. The institutional role in this area of decision making is a pivotal one.

Figure 8: How Respondents Chose Courses This Semester



Source: EERC Ivy Tech 2018–19 Student Decision Making Survey

Introductory courses are intended to help students think about which IT program is right for them and what the various IT careers are that align with each of those programs. Respondents indicated the introductory courses at Ivy Tech are having the desired effect. Over half (52%) of respondents said their introductory courses helped them learn about their strengths and weaknesses relative to IT. Just under half of respondents indicated the introductory courses made them aware of what they liked and did not like about IT(46%) and helped them understand all the program options available at the college (45%). About one-third of students (36%) felt they received information they did not previously have about program requirements, such as time to graduation and math requirements. Only 17 percent of students felt the introductory course had no influence on their program choice, and 9 percent reported

the course helped them to decide they should enter a non-IT program because IT was not for them.

Likewise, many respondents reported that the introductory course helped them think about their future career in IT. Just over 40 percent felt it made them aware of specific careers and jobs associated with different IT programs, 40 percent felt it helped them learn which careers they might be best at, and 41 percent felt it helped them learn about careers they did not know about previously. About a third (35%) reported that they acquired detailed information about IT careers, such as salaries and job types, they did not previously have. Just under a quarter (23%) felt the course did not influence their career decisions at all. These results indicate that introductory courses are helping students learn about what programs and careers are available to them and which programs and careers might be a good fit for them. This also illuminates the fact that introductory courses may be “catching” some students that “fall through the cracks” in advising—either because they did not seek advising help or they did not receive full information about programs and careers.

While the introductory courses are intended to be taken in the first semester of enrollment, students can easily miss that window without proper advising. If students self-advise, if their advisor is not aware of the sequencing, or if students simply put off taking them, they may not be taking these introductory courses until long after making the decisions those courses are meant to inform. Given that 45 percent of respondents felt the introductory courses informed them about program options, they are important for students to experience early in their educational pathway.

Advising

Most students reported seeing a general advisor. Over 90 percent of students reported seeing an advisor at least once, and 70 percent reported seeing an advisor at least two to three times during their time at Ivy Tech (see Table 1). Students were also more likely to have seen a general advisor than a faculty advisor. Coupled with the information above regarding where students sought out information, these findings suggest that students are visiting general and faculty advisors for different things. For example, students seem to be seeing general advisors for a wide range of matters that they may feel they need assistance with and seeing a faculty advisor (instructor) for specific things, like what courses they should choose. Advice from faculty may be solicited less often, perhaps only when the students feel they absolutely need it. With respect to a particular area of concern for many students, confusion about what math courses students are required to take pointed to a possible disconnect between what information students think they need and what information they are actually seeking out.

Table 1: Percentage of Respondents by Number of Times They Have Seen An Advisor

Number of Visits	General Advisor	Faculty Advisor
4+	18%	16%
2-3	52%	33%
1	22%	23%
None	7%	27%

Source: EERC Ivy Tech 2018–19 Student Decision Making Survey

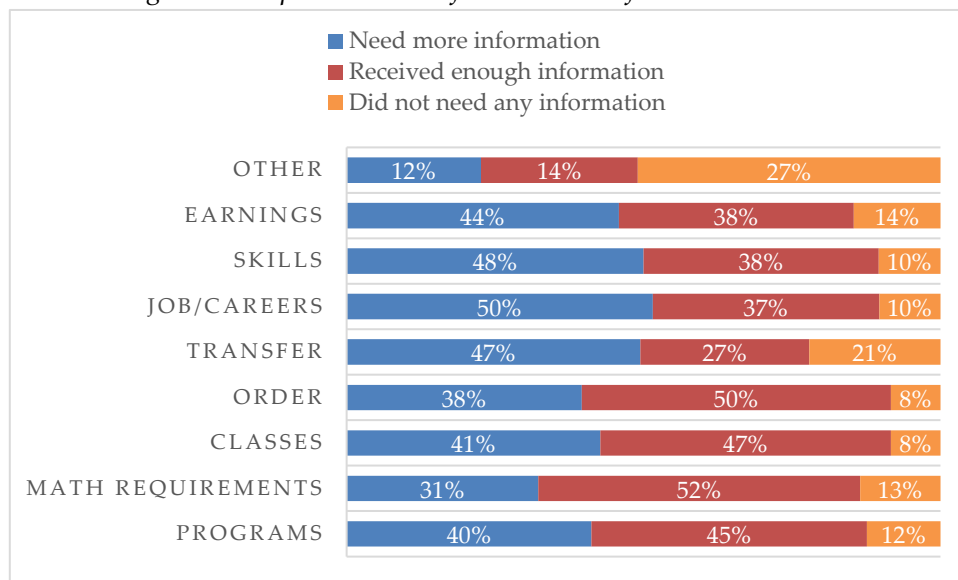
Information Needs

Students' responses were mixed with regard to whether they felt they had received enough information after leaving their advising appointments (Figure 10). Just over half of respondents (52%) felt they had enough information about math requirements. This is interesting because as noted above, 33 percent of respondents indicated they did not know the math requirements for their program or were unsure if they knew them, and 22 percent were unsure if they had to take developmental math. Just about half of respondents also felt they had enough information about the order in which they should take classes (50%) and what classes they should take (47%). Less than half of respondents felt they had enough information about the available IT programs (45%), while fewer felt they received enough information about transferring to a four-year university (27%). Students felt they needed more information about jobs and careers they could enter (50%), what skills they would learn in given programs and what skills were required for various careers (48%), and the potential earnings for specific careers (44%). Only 31 percent indicated they needed more information about math requirements. This finding aligns with the results from the previous question, which that revealed that half of respondents felt they received enough information about math requirements. It also illuminates the results noted above—that about a third of respondents were confused about math requirements and over half of respondents were concerned about them.

These results indicate that whereas 52 percent of students indicated they left advising feeling they'd received enough information about math requirements, many others—about one-third—left feeling they needed more information. Another 13 percent of students did not feel

they needed any information from their advisors about math requirements. These findings suggest that some students are unaware of what questions to ask their advisors about math requirements, leaving them to remain in the dark or creating a sense that they have all the information they need when they conclude the advising session. It is possible that when students enter advising, they “don’t know what they don’t know,” making it difficult to emphasize the importance of course requirements. Students leaving advising sessions also reported a need for more information about transfer options. This is not surprising given that Figures 3 and 4 illuminated that student information about transfer options is not complete. These data points may be correlated with the above discussion about students wanting to earn an industry certification, work, and then go on to earn a bachelor’s degree later.

Figure 9: Respondents Satisfaction with Information Received



Source: EERC Ivy Tech 2018–19 Student Decision Making Survey

Conclusion

The results of this survey provide a few key observations on students’ decision-making processes around community college IT programs. Overall students appear to be entering the

programs with some sense of their educational goals—with a fairly even mix of students focused on one goal versus focused on multiple goals. Yet, despite their apparent ability to articulate a goal in their early stages of enrollment in an IT program, students lack information about key pieces of information that would help them make fully informed choices about which programs to pursue. Many students are not aware of all IT program options or their associated transfer options, and their default is to enroll in computer science programs until they learn more about these other options. While students seem to think they have enough information about topics such as course requirements and specifically math requirements, they also report confusion about these topics. Nearly all students recognize the importance of understanding these requirements, but some seem unable to articulate their need for help or perhaps are unsure of where to go to seek it. Finally, students at this early stage of enrollment are generally unclear on their career options and desire more information on the topic.

Students rely heavily on institutional resources for information about programs and careers relative to other sources of information. While they seem to be searching for general information on their own, using internet sources including the school website, advertisements, etc., they turn to institutional sources to gain more strategic information such as which program to enroll in, what skills are required for certain jobs, and what courses are required to achieve a specific outcome. When it comes to information on specific courses—and, to a lesser extent, careers—students rely on faculty.

Based on these findings, community college IT programs can seek to better support students by providing more complete information to all students early in their enrollment. They can consider ways to integrate information on the range of IT programs, their transfer

pathways, and their course requirements into introductory classes early in students' enrollment. At the same time that colleges consider ways to provide more information to guide students' programs selection, they can seek to accompany that information with more guidance on career pathways associated with programs. Given students' high reliance on online resources, colleges may seek to further develop their websites to make this information clearly available and to provide links to other valuable and trusted online resources. These are some steps that community colleges as institutions can take to ensure they are working to better support students in their decision-making processes about IT programs and careers.

Future Research

Additional analyses will be conducted as part of a larger mixed-methods, multi-year research project to increase understanding of the decisions students make with regard to pursuing credentials (e.g., degrees and certificates) at two-year institutions and careers in information technology fields. Relying on multiple sources of data, the project brings together a diverse team to investigate the complex phenomena of student decision making. The project examines how students' experiences and information resources influence their decision making and how their decision making evolves over time. The study takes a multidisciplinary theoretical approach drawing on literature from career development, psychology, sociology, and economics and employs a variety of research methods (student surveys, in-depth longitudinal student interviews, point-in-time interviews with faculty and administrators, secondary data analysis of administrative records, site visits, and document analysis). The knowledge generated by this research project will be useful to students, the public, community college/technician education professionals, and policymakers who are committed to increasing

student success in advanced technological programs that prepare students for a middle-skills workforce.²

Future analyses will examine the issues in this paper in greater depth to better understand students' decision-making processes through a variety of data sources. Additional data collected using the same survey, which is currently being distributed to new first-year Ivy Tech students, will help corroborate these initial findings and illuminate any differences among semester cohorts in the post-pandemic context. Further analyses will examine third-semester students as well. Individual Ivy Tech campus policy reviews will help highlight policies and practices that support or impair students' decision making about programs and careers. Interviews with students enrolled in Ivy Tech's IT programs (both before and during the pandemic) will shed more light on how and why students make certain decisions, highlight areas where they may have confusion, and reveal possible ways that confusion can be alleviated. Interviews with students who have completed a degree or credential in an Ivy Tech IT program and have likely joined the workforce will help increase understanding of how students feel about decisions they made before and during their time at Ivy Tech and what kinds of decisions about their career they continue to make after leaving the institution. This information, coupled with that presented here, will combine to help institutions understand student decision making and assist students in making the best educational and career path decisions they can.

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