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Introduction

Students entering technician education programs in the United States today can look forward to ample opportunities for well-paying jobs with potential for career growth. The health of the American economy depends on a technical workforce capable of participating in a job market skewed toward science, technology, and engineering–intensive roles (National Science Board, 2019). However, the navigating paths to a technical career can be a challenge for community college students. The options for programs and careers are many and varied and not always clear. For students in information technology (IT), for example, the many subfields can be confusing, especially regarding the requirements and potential employment outcomes of individual subfields (Edwards & Van Noy, 2020). The wide variety of opportunities available unfortunately creates the potential for students to take missteps along their paths that can lead to problems in completing their academic programs and transitioning effectively to new careers (Scott-Clayton, 2011). It is therefore important that students have and understand the information about their pathways before they make programmatic decisions. To ensure that this happens, an important first step is to understand where and when students look for information about their programs. In this paper we examine how students access and make sense of information and recommend ways to improve the dissemination and visibility of information meant to smooth out students' paths into technical fields.

Understanding where students get information when navigating choices about entering a pathway, especially when making decisions at various stages in their education, is crucial to providing them with adequate guidance and support. Some research focused on technical programs found access to quality information and active advising/support to be critical to student success (Van Noy et al., 2016). Colleges have increasingly sought to improve the information and advising resources available to help students navigate the oftentimes confusing terrain of programs options (Bailey, Jaggars & Jenkins, 2015). Without knowing the sources of information that students are using, key community college personnel such as advisors, instructors, and administrators may not be as effective in guiding and supporting students as they choose their academic program and explore their career options. It is critical to understand students' information-seeking behavior so that institutional staff can make sure students are getting a sufficient amount of high-quality information when making decisions.

To address these issues, this paper examines the types of information sources that students in community college technician programs seek and utilize in their decision-making process. Specifically, we focus on IT students at Ivy Tech Community College in Indiana. This paper begins with a dive into the decision-making literature to highlight sources of information that students are known to use at different stages of their experience in higher education. Next, we discuss our methodology, the institutional context for our study, and then our major findings, and we conclude with some suggestions for ensuring that students are getting enough and accurate information from the sources they go to most often.

Background

As we highlight throughout this section, the literature highlights three major decision points where students seek information: when choosing a school to attend, when choosing a major/program, and when seeking out a job or career. These three stages are not mutually exclusive; students considering technician programs, for example, may situate their choice of a major, program, or certificate in a way that is deeply intertwined with their choice of a job or career. In this paper, we focus on the latter two decision points. Likewise, literature outlines three major sources of career indecision that young people face: lack of readiness, lack of information, and inconsistent information (Gati et al., 1996). The latter two factors in indecision make it ever more important to understand the sources of information that community college students use to make career decisions.

Information deficits can be especially problematic for students—especially women—in minoritized communities (Lease, 2004; Bingham & Ward, 1994). Research has demonstrated that students who are racially minoritized lack information about the world of work (Bowman and Tinsley, 1991; Brown, Minor, & Jepsen, 1991). According to Greenbank (2004), the working-class students in their study tended to prefer information that came from direct personal experience or from their observations of others, neither of which could be consistently relied upon to provide the most accurate information. Lease (2004) found that students at community colleges had lower socioeconomic status and received less mentoring than students at other institutions; as a result, they also had less knowledge of the world of work. Similarly, Baker et al. (2018) found that community college students have limited information about labor market outcomes. Therefore, when choosing a major, they tended to prioritize course enjoyment and grades. An exception to this research, Lease (2004) found that African American students had greater work knowledge but lacked an external locus of control compared to white students, which made it difficult for them to make career decisions.

Literature on information sources is often embedded within the larger literature on decision-making across various points of a student's educational career. There are many fields that deal with decision-making; this study draws primarily from the sociological perspective, which considers a person's social context when making decisions. How someone seeks opportunities and information reflects their social environment and individual dispositions (Krieshok et al., 2009; Dougherty, 2018). People have differential access to information that falls along class and race lines; this is partially an issue of the allocations of resources and institutional discrimination (Dougherty, 2018). Individuals vary in their access to financial resources and their knowledge of what opportunities are potentially available, and they have access to various social networks and forms of cultural capital (Hodkinson, 2008; Hodkinson & Sparkes, 1997). People's actions are culturally and socially bound (Hodkinson & Sparkes, 1997) because their access to various forms of capital constrain their decision-making and impact both the information sources they have access to and what they can envision for themselves as possible (Hodkinson, 2008).

In our review of the decision-making literature, we found that the information sources students use fall into three major categories: personal social networks (e.g., parents, friends, relatives), online resources (e.g., Indeed,

LinkedIn, Google), and institutional social networks (e.g., teachers, advisors). It is important to understand these categories as distinct from one another because students perceive the information that they gather from each one differently. Personal social networks are often an initial source of trusted information, given the closeness of the relationships in these networks (e.g., Somers et al., 2006). Online resources are plentiful for gathering information related to higher education decisions, but websites are not always easily navigable and do not always present information in the clearest way (e.g., Schudde et al., 2019). Institutional social networks should be the most informative resource, and while students do gather a lot of information from the resources in this category, they do not always use these resources to their fullest capacity (e.g., McKinney et al., 2022).

Personal social network information sources.

Social networks play an important role in how students access information across all decisions they make during their time in school. Students' social networks consist of their personal connections including both strong and weak ties (Granovetter, 1983). Strong ties are relationships that are more close-knit, such as the relationship between two best friends, whereas weak ties are more akin to casual acquaintances, such as a relationship a student might have with a classmate. These ties represent avenues through which a student might inherit and develop social capital (Bourdieu, 1984): a resource that can be leveraged to increase an individual's financial resources and cultural knowledge.

When choosing a career path social networks are central to student decision-making. These networks take different shapes depending on the various demographic characteristics of the student and what decision is being made. Various studies have demonstrated that parents were key sources of information when students were choosing a major (Chung, Loeb, & Gonzo, 1996; Keillor, Bush & Bush, 1995; Newell, Titus, and West, 1996). Beggs et al. (2008) found that students also relied on friends, relatives, and counselors for choosing their major and, further, that traditionally aged prospective college students relied most heavily on family members and high school teachers as sources of information. According to Somers et al. (2006), for some prospective community college students, word-of-mouth was a major information-gathering method, and peers and family were considered to be honest brokers of information. Chin Yuk et al. (2020) found that US business undergraduates at a large university were most likely to rely on social networks, personal experiences, and online resources as career information sources. Zondag & Brink (2017) found that food marketing-related majors at another university recalled professors and courses to be the most useful sources of information followed by career fairs, jobs/internships, and family members. Parents had more of an impact than other personal social network members (e.g., counselors, teachers, friends, relatives) on the career choices of younger students. Parents and other immediate family members have a strong influence on the decisions made by college women who are pursuing careers in IT (Creamer & Laughlin, 2005). In addition, Creamer's (2009) interview subjects note that people they are closely connected to played a role in their career interest development.

Many parents and their children encounter bias related to institutional discrimination and stereotyping that impacts students' career exploration and experiences (Worthington et al., 2005). Higher education institutions may make assumptions about which communities are and are not interested in pursuing a degree based on raced

and classed stereotypes and as a result may not funnel resources and information toward those communities. Such practices limit the information held by and shared within social networks, which has important implications not only for those communities but also for the development of the US workforce.

Consider Creamer's (2009) finding that there was a notable gap between students' knowledge about job options in IT, how much career exploration they did, and their interest in IT as a field. This illustrates how socialization and the messages people receive from their social networks can impact their aspirations and expectations for what is possible (Hodkinson, 2008; Hodkinson & Sparkes, 1997). What an individual perceives is possible for them to accomplish is often grounded in social class (Dougherty, 2018). We previously noted that, relative to students with parents who previously attended college, those who come from minoritized communities—especially those who are first-generation students—may not be able to gather as much helpful information from their parents when making academic and career decisions. In Ceja's (2006) research on first-generation Chicana students, older siblings who had already navigated higher education could provide more information to their first-generation Chicana siblings than their parents could offer them. Similarly, Gonzalez Canche et al. (2014) found that among community college students, the advice of siblings and extended family was more important than that of parental guardians in the college choice process. So, while some students are able to get information directly from their parents, it appears that students from some minoritized communities need to seek beyond their parents for information in order to make the best decisions for themselves. It is worth noting that the fact that these student's information sources are different does not necessarily mean they are getting less information or that the information they are receiving is of lower quality.

Online resources.

Online resources such as college websites can be important sources of information for prospective community college students (Zastrow & Stoner, 2007). Nguyen, Gutierrez, and Smith (2022) argued that online resources are one way community colleges mitigate the structural challenges that students deal with on their path to completing their programs. At the same time, however, they note that there are often problems with the quality of community college websites, such as being difficult to navigate or having poor content delivery (Nguyen, Gutierrez, & Smith, 2022).

Of course, the quality of a resource is of little relevance if no one is using it. Fouad et al. (2006) found that few students used a career counseling website that was very clearly accessible through their school's website. When looking at transfer information available on college websites, Schudde et al. (2019) found that the information on transfer options was often convoluted and difficult to navigate and concluded that community colleges should be intentional about updating their online information.

Though the earliest research on student decision-making rarely examined the use of general internet search engines, newer research on community college students has found that when students were unfamiliar with an issue, they conducted Google searches for information (Rennis et al., 2015). A study by Beggs et al. (2008) used qualitative and quantitative methods to better understand the foundations of the psychological processes that undergraduates underwent when choosing majors. They found that young people relied more on personal

networks than on online resources; in fact, despite what they expected, they found that students did not really perform many online information searches at all when choosing a major (Beggs et al., 2008). Beggs et al. (2008) found that if websites were not easily navigable or included long text, students were less likely to use it. Thus, they postulated that despite the internet being a vitally important source of general information for this age group, students may have rejected the internet as a source of information about majors because the college websites they encountered too often were not easily navigable or presented information in ways that were hard to understand (Beggs et al., 2008). Similarly, Margolin et al. (2012) found that students quite frequently had usability problems when trying to find information they needed for degree selection and completion, with the two biggest problems being the lack of ability to find the information they needed and the lack of ability to understand the information provided. These findings demonstrate how essential it is for colleges to make sure that their websites are not only up-to-date but also easily navigable and easy for students and their families to use to gather information.

It is important that websites are updated and tailored to student needs. When thinking about community college specifically, different types of students may use online resources in different ways. For example, traditional students—those between the ages of 18 and 24—may use their institution's website for information on programs, financial aid, costs, etc., whereas adult students who are over 25 might be more interested in finding out about a school's flexibility, support services, and the success of graduates (Zastrow & Stoner, 2007). For this reason, it is important not to neglect some parts of the website in favor of keeping others updated.

Institutional networks as information sources.

Among the subjects of a 2019 study by D'Amico et al., the three most prevalent sources of information for career decision-making were college instructors, advisors, and family. After examining the role of personal social networks and online resources in student decision-making, it is notable that two of the three most dominant information sources identified by D'Amico et al. are institutionally based. We examine these sources below.

The information available to be transmitted from an advisor to a student is markedly different from the information available from a parent, as is the very nature of the two relationships. Rucks-Ahidiana and Bork (2020), when comparing how students use on-campus versus off-campus relationships for information and support, found that on-campus relationships developed by community college students were key information sources and were useful for learning about more impersonal policies and procedures, whereas off-campus relationships were better for support and getting more personalized information (Rucks-Ahidiana & Bork, 2020).

School advisors are a key source of institutional network information for students. Students rely most heavily on advising when they are choosing classes. Advisor input at this point is so highly valued that some institutions require advising sessions in order for students to register for classes. While advisors are often a reliable source of information, students' perceptions of advisors' helpfulness vary considerably among community college students. A study of 24 community college students revealed they did not necessarily perceive advisors as reliable sources of information. (McKinney et al., 2022). Rather than rely on advisors for information, some students chose to self-guide by selecting classes on their own. For students at community colleges, self-guidance

could lead to choosing the wrong classes, which could not only derail the students' education pathway but also have serious financial consequences—a particularly heavy burden for students at community colleges who are often not high-income (Jaggers & Fletcher, 2014). McKinney et al. (2022) argued that students who are unhappy with the advising they receive may seek help from instructors or advisors they are not assigned to. However, when community college students are dissatisfied with their academic advising and rely instead on other administrators or instructors, they may have to wait longer for advising and sometimes even become misinformed about their plan of study (Goomas, 2012).

It is clear that students often look to their institutions for reliable information when making decisions. Still, they do not necessarily use all the informational resources those institutions provide for them (Hayes & Prus, 2014; O'Neill & Sai, 2014). Those resources take a variety of forms. For example, student success courses can help students navigate through community college, especially in the first year, by providing them with the information and skills they need to be successful. Bickerstaff et al. (2017) found that a college preparatory course helped community college students develop study skills and academic habits, and Fouad et al. (2009) explored career decision-making courses as a way to increase the amount of information students had about their career options.

Some institutional programs and centers are designed to help students with career decision-making, and many schools also offer career counseling. However, while students are often aware that career counseling is available on their college campus, they do not always utilize it (Fouad et al., 2006). This may be because they are not aware of the specific services that are offered by the counseling center (Kahn, Wood, & Wiesen, 1999).

Finally, West, Newell and Titus (2001) found that students also relied on materials that their institutions distributed in hard copy such as school catalogs and department brochures. These tended to be more influential than career planning services and 'career day' programming (West, Newell, & Titus, 2001).

Obtaining brochures and recruitment materials, consulting with advisors, searching the website, and making personal connections with employees at the college are just a few of the ways students gather information from institutional resources as they navigate through community college.

TABLE 1. Examples of Information Sources Consulted by Ivy Tech Students Making Academic and Career Decisions, by Category

Type of Information Source	Personal Social Network	Online Resources	Institutional Network
Examples of Information Source	• family members • friends • roommates • employers • coworkers	• Ivy Tech website • job search websites • online forums • news websites • social media	• general advisors • professors/instructors • college career center • professional contacts met through Ivy Tech connections

Methods

This study was developed to garner a more nuanced understanding of how students enrolled in technician education programs at Ivy Tech made decisions about their careers and education and what information sources they used to do so. We intend for our findings to serve as a foundation for better understanding how information is used by students in community colleges to make decisions at community colleges. We analyze data from two sources:

1. Interviews with students who began their education in an IT program at Ivy Tech after the beginning of the pandemic in March 2020 (program beginners)
2. Interviews with students who recently completed an IT degree at Ivy Tech that they started prior to the pandemic, but were engaged in the job search primarily during the beginning of the pandemic (program completers)

Our data analysis will be discussed in a way that is grounded in the sociological perspective on student decision-making. We will draw from the above-cited literature to reach practical conclusions about the ways that IT students at Ivy Tech gather and weigh data from different information sources, thus contributing to the knowledgebase about student decision-making.

Institutional context of the study.

Ivy Tech Community College is Indiana's public community college system. The system's 19 full-service campuses and 27 sites stretch across the entire state, serving almost 150,000 students in the 2020–2021 school year both in person and online. Ivy Tech offers four different modes of learning: 1) traditional, in-person courses, 2) blended and Learn Anywhere courses, which are hybrid, 3) virtual instruction, which is synchronous and Zoom-based, and 4) Ivy Online, which is asynchronous and online. Within the greater umbrella of Ivy Tech is the School of Information Technology, which offers degree and certificate programs in computer science, cloud technologies, cyber security / information assurance, data analytics, informatics, IT, IT support, network infrastructure, and software development. Many of these degrees and certificates are covered under Indiana's Next Level Jobs initiative. Next Level Jobs is a statewide workforce development program that provides funding to employers and future employees in high-demand fields. The program's Workforce Ready grant, which is accepted on all Ivy Tech campuses, covers tuition and mandatory fees for students pursuing high-value certificate programs in specific fields, including IT and business services. The Next Level Jobs program may have an impact on how students in Indiana think of school choice. Instead of selecting a program from among the options offered at their first-choice school, they might seek out a different school from among the pool of those receiving Next Level Jobs funds. Additionally, because the Workforce Ready grant only funds specific programs that supply workers for the high-demand jobs needed in the state, it constrains decision-making by restricting programmatic choices.

Ivy Tech campuses offer 2-year associate degrees, both applied and for transfer, as well as career certificates and apprenticeships. Each campus has its own system of advising, though all campuses offer both academic and

career advising in some form. It is common for advisors to attend to students' academic advising needs while an instructor attends to their career advising needs. Advisors and instructors often work together to assist students with various needs. Advisors will often propose a schedule for a student that will then be amended by instructors based on their discussions with the student about careers, particularly when the student is confused about which program to enter. Instructors will also step in on academic matters at times because advisors are not always aware of every course available in the department during any given semester. For example, if a student is unable to take an IT course at a specific campus due to schedule restraints, an instructor may be aware of a Learn Anywhere section of the course offered at another campus that an advisor may not know about. Advisors at Ivy Tech help students choose a major, register for classes, and change majors or programs. At some campuses, advisors also provide help on career matters. At most campuses, advisors are available for virtual advising as well as in-person advising, especially since the onset of the COVID-19 pandemic. Most campuses offer advisors who are specifically trained to work with students enrolled in the campus' School of Information Technology. These IT-specific advisors offer students specialized information about IT programs and careers, although they generally handle advising for additional technical schools such as nursing and advanced manufacturing. There are also career centers at most of the Ivy Tech campuses where career coaches help students with things like interview preparation, resume reviews, and other career-related advising needs.

Subject selection.

For both student samples—program completers and program beginners—recruitment was initiated via email, and an incentive of a $25 Amazon e-gift certificate was offered in exchange for participating in the study. Interviews were completed in two stages: the first stage involved two sets of interviews of program completers, and the second stage involved one set of interviews of program beginners.

Program completers—those who had recently completed an IT degree or certificate program—were identified via Ivy Tech institutional data. They were originally selected to be representative of the larger IT student population demographics. When the initial sample was completed, it was heavily skewed toward white males; in the interest of representing different viewpoints, that initial random sample was supplemented by some purposive sampling of non-white and non-male students. To the extent possible, the research team selected a diverse mix of students based on categories such as gender, age, program/certificate, campus, race, and socioeconomic status.

The first round of program completer interviews was completed in the summer of 2020, and a second round was completed in the summer of 2021. Students completing a certificate or degree during the Spring 2020 semester were included in this data collection. During the first stage, the research team conducted 17 interviews. Students in these interviews discussed decisions made before the onset of the pandemic, since they had completed their Ivy Tech education before it began. During the second stage of interviews for the program completers sample, which occurred in the summer of 2021, our team conducted 6 interviews. These interviews delved deeper into pandemic-era decisions due to their timing. Participation was likely low because in many cases the research team only had access to a student's Ivy Tech email address, which they were unlikely to have access to after they completed their degree or certificate program.

Program beginners—those who had started an IT program after the pandemic began in March 2020—were identified through survey sampling of Ivy Tech IT students. Our total survey sample included 907 participants. Of that sample, 77 percent were male, and 23 percent were female. In addition, 73 percent identified as white, whereas 27 percent did not. To recruit students for interviews, the survey included a question where students could indicate an interest in participating in an interview. We then sent an email to the 93 students who volunteered to invite them to participate in an interview. Of those 93 students, 17 were interviewed for this study in the summer and early fall of 2021. This sample discussed decisions made both before and during the pandemic.

Interview guides.

We developed two interview guides based on decision-making literature. With both samples, our primary goal was to understand how the students we interviewed made decisions about careers and education, what sources they used for information, what decisions they ultimately made, and how they felt about these decisions. Both interview guides were divided into five sections: 1) general questions about the students' background, interest in IT, hobbies, etc., 2) questions about their past education, including exposure to STEM/IT in elementary school, high school, and any prior college education, 3) questions about prior or current work experience (IT or non-IT), internship experience, salary expectations, and what they considered important relative to career, 4) questions related to social structure, such as expectations of family and peers, cultural influences, etc., and 5) questions about decision-making in general, including their perceptions of how they make decisions, examples of experiences or people that helped shape decisions, etc.

In addition to the five categories described above, the interview guide for program beginners included a robust set of questions the effects of the pandemic. These questions focused on COVID-19's influence, if any, on students' career and educational decisions, as well as how the pandemic influenced their experience of working, going to school, caregiving responsibilities, and advising.

The program completer interview guide contained the same general questions as that for the beginners and was divided into two sections: one for the first set of interviews, and one for the second set of interviews. Both sections focused on students' decision sets, as well as their career and educational pathways. The participants were prompted to reflect on past decisions retrospectively, as well as to discuss decisions they were currently making. Since the first set of interviews was completed at the start of the pandemic, questions for this set generally did not focus on the pandemic. Questions for the second set of interviews focused on what changes had occurred in each category since the last time researchers had spoken with the subject. Since these interviews occurred many months after the first set of interviews, researchers asked questions directing the student to reflect on the impact of COVID-19 on their decision-making.

Data analysis.

All interviews were conducted via Zoom and phone calls, recorded, and then transcribed by a research assistant using OtterAI. After interviews were completed, transcripts were uploaded to NVivo data management software, where they were coded by research assistants. The codebook was based around the main research foci:

education and career decision-making. We developed a method for coding and sorted out definitional issues via piloting the codebook, and we conducted interrater reliability tests during the pilot phase. After piloting was complete and a procedure was established, it was replicated by all coders. As new codes were created, they were collaboratively defined and piloted. After coding was completed, we created simple summaries for each interview subject that included 3 to 6 bullet points describing their usage of information sources. We used these summaries and the NVivo file to perform the analysis described in the next section.

During analysis, we identified the major information sources that each sample used to make their career and college decisions. Information sources were further divided into three categories: personal social network sources (personal connections), online resources (any information source accessed online, including the Ivy Tech website), and institutional network sources (any source provided by Ivy Tech except the Ivy Tech website). Institutional network sources were further separated into subcategories: general advisors, instructors, IT-specific advisors, professors, and career development teams. Categories are not mutually exclusive, and there is overlap that occurs between them. For example, although Ivy Tech's website could be considered an institutional resource, we categorized it as an online resource for the purpose of this analysis because access to it is not limited to students and other affiliates of the college; it is accessible by anyone.

Findings

It is critical for students to have the information they need about programs and careers as they prepare to enter community college. They face myriad decisions—which school to attend, which classes to take, which program to pursue—that all have implications for their ultimate career path. When students make these decisions, they must have complete and accurate information about the options available to them if they are to make informed choices and reach their goals efficiently. Students in our samples relied upon multiple information sources and used them at different times to access different types of information. In this section we present our analysis of our interviews with two cohorts of students at Ivy Tech, program beginners and program completers, illustrating our findings with quotes from these interviews as well as with specific examples in text boxes throughout the section. In the subset textboxes we highlight students who exemplified the ways that students in our sample pools often employed multiple information sources when approaching their decision-making processes. These students were also navigating community college before and during the pandemic, demonstrating the ways that student information gathering changed during this time.

Personal social networks.

Students often engage with their personal network when making decisions; it appears that this is especially true when making decisions about careers. Personal social networks were one of the three major information sources used by members of both cohorts. In this context, personal social networks refer to family members, friends, and roommates that guide students through their academic or professional pathways. Out of 26 participants in both cohorts, just under half (12 participants, 46 percent) mentioned that they used their personal social networks as an information source when making academic or career decisions. The power of a personal connection can be quite strong, as we discussed in the literature review.

Some participants learned about Ivy Tech through their personal social networks. When making the decision to attend Ivy Tech, some participants consulted their personal social networks. For example, one program completer mentioned that he consulted most of his friends about his college decisions, specifically mentioning that he ultimately decided to attend Ivy Tech because one of his friends suggested that they attend the school together. This particular friend influenced not only the student's school choice but also his program choice.

Students in our sample relied on personal social networks when choosing which program to pursue, a decision that often closely aligned with their ultimate career decision. A few students used personal contacts who were not employed in their target field as information sources for academic and career decisions. These friends and family members knew the participant well and were able to make suggestions based on that knowledge. For example, one completer said she runs decisions by her family and friends and likes to get advice from her adult children. She said, "They know me. My kids are 32 and 31. I can bounce stuff off my kids, and they

will tell me 'You will hate that, you know.' So, it is nice to have that." Another student was heavily influenced to pursue a career in the IT field at the suggestion of a cousin who was a businessperson and not an IT professional:

> I guess when I was younger, my cousin gave me the idea of doing something in informatics. Like, being an administrator, and I did research on it. And that's kind of how I got the idea because I always liked IT. So that's pretty much it. From there I kind of knew.

Although this student ultimately ended up in a software development program rather than an informatics program, his cousin's suggestion helped guide him into the general space of IT. Other participants learned about their fields of study from friends and roommates and ultimately chose to go into those programs because people they knew had degrees and careers in those fields. These close connections are generally ones that people continued to rely on even through the pandemic.

According to the literature, people tend to place a lot of trust in their social networks, believing that members of their social networks know them and what they might like. This is especially true of family members and close friends. The participant mentioned previously who often relied on her adult children for advice told us that she chose her program because her children "thought, like I did, that I would enjoy cybersecurity a lot." Although this particular participant ended up not enjoying the field of cybersecurity, this example still highlights how important the influence of close friends and family can be on career and program decisions.

Ivy Tech institutional networks.

Instructors and advisors were the primary sources of information students received from their institutional networks at Ivy Tech. Many students used institutional networks to find information about college and careers. Over half of our sample reported using some source of information provided by Ivy Tech as an information source. Institutional networks include general as well as IT-specific advisors, instructors, and mentors, and Ivy Tech career centers or career development teams. Network sources such as advisors were consulted for both academic and career information. Students relied on faculty advisors and mentors as sources of advice when making both career and academic decisions. For example, one student said that a discussion with her instructor was "two in one," meaning it encompassed both academic and career information. Students tended to seek the help of academic advisors or IT-specific advisors strictly for program-based information, such as which courses to take.

Instructors tended to be among the most helpful members of students' institutional networks. This was especially true of instructors who still worked in the field because they knew specialized information about the IT field and were able to help students get a true feel for the career path. One student said her professor, who doubled as an instructor advisor, helped to give her a genuine perspective on what an IT job might be like. She said she was able to ask her instructor for "not the glitz and glamour and all that," but rather "what's the ugly of it?" She felt the instructor was "super honest" about what the job really entailed. Instructors, while not necessarily knowing students as well as family and friends, have a lot of knowledge about the field of IT and what career opportunities will be like.

Another participant explained that her instructors were able to give her a lot of advice from their personal experiences in the field, which she appreciated as she moved through the program and was faced with making decisions about what path she wanted to pursue beyond Ivy Tech. She said she spoke with one instructor "about whether to transfer or not, and she said I can do a lot with an associate degree, but if I want to be an art director or creative director, it would be easier with a bachelor's degree."

A completer participant who received a cybersecurity certificate and works in cybersecurity and information assurance has plans to continue his education in the future to eventually obtain a master's degree. He routinely uses multiple sources of information when he is making decisions. He recounted when he first saw the advertisement for his current job he reached out to his professor (a member of his institutional network) to ask for advice and insight relative to pursuing his career. He also consults his friends and family for their opinions, his advisor, and then relies heavily on his own interest in something. His major information sources are his personal social and institutional networks.

Faculty and instructors' information has a strong influence on student decisions because the information often comes with recommendations. A program beginner was directly influenced to enter a selective continuing education program by one of their professors, stating that he "was recommended by a professor for a training program through Salesforce," where, upon completion of the program, he would be able to earn a certificate, and receive assistance in finding jobs in the field. This faculty member not only provided the necessary information for the student, but also provided a professional recommendation. A recommendation could be more influential to a student's decision-making than just straightforward information provision. Another student regularly reached out to one of his professors with job descriptions to get her opinion before applying.

There were also rarer, but important, instances when members of students' institutional networks helped them expand their institutional networks by connecting them with people in their field of interest. For example, one student mentioned that a professor had expanded her professional network by connecting her to someone in her target career field, which helped her figure out her career trajectory. Instructors play a critical role in providing career advice to students who see them as experts both with academic and personal experience in their fields of interest.

Some particularly enterprising students reached out directly to professionals in their target field or career to gather more information, and others expressed a desire for more contacts of this type. Two completers used their networks at Ivy Tech to make connections with people in their chosen field of study. One student said she likes to talk with people who have personal experience with a given job or career path and appreciates hearing from the staff or instructors at the school what its recent graduates are doing. Another participant was connected with people who work in her field and received some critical advice that ultimately led her to starting her own business. She explained,

> I met with a couple different people who were in my field. And one of them is a lady who lives maybe an hour from where I live, she's in a different state, but she runs her own business doing a similar thing. So, I just asked her if she wanted to talk, and if I could ask a few questions about what she does. And we talked for maybe, I don't know, half an hour, 45 minutes. And she helped help me feel more confident that I could do it.

This former Ivy Tech student was able to make giant strides toward her career because she reached out and got advice from people in the field who she was connected to through her institutional network at Ivy Tech. This example shows that faculty and instructors can play an active role in students' information gathering in ways that influence consequential student decisions.

Some students utilized the career centers available at Ivy Tech when gathering information about potential careers and job leads. One student mentioned that he used the career center on the Indianapolis campus (which was not his primary campus) because he thought that there would be more resources at that location for the type of work that he wanted to do:

> I used my local area career center, but I did not get enough help from them. However, I contacted the career center in Indianapolis, which is in a bigger city, because I was assuming that they have more resources compared to the small-town career center. And they have more connections. So, I used them, and they did really help me a lot, the career counselor from the bigger Indianapolis college. They found some connections, they connected with me to their connections, they follow up with me. They also followed up with their connections making sure that my resume is in their hands and all those things. So, they really did a great job from the Indianapolis campus.

This particular quote highlights the power that networks play in students' lives and the ways that institutional resources, like a well-connected career center, can have a real impact on students' career trajectory. However, this quote also demonstrates that not all career centers are created equally in terms of the resources they have available for students.

Students relied more heavily on advisors than on faculty members when making decisions about courses and programs. Some participants talked to more than one advisor about classes before making the decision to enroll. At least one participant considered their IT-specific advisor to be the most important information source that they used, noting they used at least one other information source as well. Another student, who was choosing between business and IT as a program choice, spoke with an IT-specific advisor who influenced her to think more seriously about pursuing a career in IT.

The pandemic forced Ivy Tech and many other schools to move to virtual advising models. For current students, this made advising more accessible because they could attend meetings with their advisor from anywhere rather than having to go to campus. One student said that they even felt more comfortable in virtual meetings: "... it was less formal feeling. You know ... like when you're in person, it feels almost like an interview ... Where on the phone, it's like more familiar feeling for some reason, so I was a lot more relaxed."

Providing virtual advising for students was crucial with the impact that the pandemic had on our ability to meet in person, especially informally. Virtual advisors played an important role for many of our program beginners, helping guide them in the right direction so they chose the correct classes and programs. This virtual connection became especially important to these students because they lacked in-person advising and in-person connections to the classroom, having enrolled after the pandemic began.

Institutional networks, especially faculty and advisors, are critical for students. These connections come with information and recommendations that shape student decision-making.

The Internet: A popular information source.

Students tended to use job search websites and general search engines to find out information about careers, and the Ivy Tech website to find information about academic programs. The most popular information source for participants was the internet; 16 out of 26 (62 percent) of participants reported using it as an information source. This is a logical choice for an information source given the ease and access that most people have to this resource. This resource was also important given the nature of the COVID-19 pandemic, which moved many interactions online. Given the busy lives of many Ivy Tech students, it makes sense that online resources, available at any time, on any schedule, were the most popular sources of information.

Students gathered a lot of information on the internet, using it to research academic programs, job opportunities, workplace experiences, and more. Students used online job boards such as Glassdoor, Monster, LinkedIn, Indeed, and ZipRecruiter to search for jobs and to assess the job market in different geographical regions. Students also used the Ivy Tech website; though most used it to look for information about their academic programs, some also used the Ivy Tech online portal to find local jobs or internships. A few students mentioned finding information on social media websites. There were also a few students that just "Googled it" when they had questions and were unsure of where they ultimately acquired information after using the browser.

Respondents tended to use vague descriptions of the online resources they consulted. Many students used online resources to look for academic and professional information, but they were not always able to specify what websites they used or how exactly they used them. One student, when asked what websites he used while scoping out the job market, responded: "That is hard to say, because I would just Google it, and then click on, you

A recent enrollee became interested in IT because her brother-in-law is in IT and was able to pass along knowledge of the field. Gathering as much information as she could about IT careers was an important decision-making aspect to her. To do this she also spoke with an Ivy Tech advisor, "Googled" IT careers, and talked to a faculty advisor. Since all of this was happening during the pandemic, she took advantage of virtual advising. In addition to using all these resources for information gathering, she also routinely goes to her husband for information and advice when she makes decisions.

know, a bunch of different ones, to compare numbers." When asked which information sources she used, one program beginner added, "I also Googled, of course," to the end of her list. Some students mentioned using "search engines," "online research," or "the internet," without elaboration or specifics, to find academic and professional information. Despite frequently turning to online resources for academic and career information, students were not always sure that the websites they were using were the best source of information. For example, one program beginner said:

> I'm not sure where to go to find the information. Because if I just Google it online, I find many articles. Many, many websites. I don't know what to read, some of them are years old, some of them are current; I don't know which is which. Sometimes they don't have a date on the website. And I think I need to learn from people what I need to know.

Many students also mentioned using job search websites as an information source for job opportunities. This may have yielded different results than using a generic search engine because these websites are designed for job searching, whereas most search engines are geared more toward e-commerce. One program completer mentioned that she used the job search site Glassdoor as a resource but expressed regret, saying "if I would have known about LinkedIn . . ." A few other students mentioned LinkedIn (Ivy Tech students have free access to the site) as well as LinkedIn Learning. One student said:

> I like to use LinkedIn. There's always Indeed, but sometimes I feel like their postings are just meh. There's Glassdoor, ZipRecruiter. But they are really annoying with emails. I'm trying to think. Well, there's another one. I think that's kind of popular, but I can't remember the name of it. But I use LinkedIn and Glassdoor a lot to get information specifics, not just [job] postings.

LinkedIn and Glassdoor were the two most popular job search websites among our interviewees, although some also used Indeed, Monster, and ZipRecruiter. These websites helped students gather more information about potential jobs and careers they might pursue.

One completer participant used multiple information sources to make career and program decisions throughout her tenure at Ivy Tech. She used the internet to apply for jobs on online job boards and attended a few institutionally run conferences where she got the opportunity to meet with employers and practice presenting herself in a professional environment. She also had a professor who would stay behind after class to provide students with information about the cybersecurity program and about careers in the field. Perhaps most interestingly, she and some of her peers in the cybersecurity program set up an informal cohort on their own. She reported that the group would get together and run simulations of vulnerable machines, which they would work together to resecure. These friends were an important information source for her.

The Ivy Tech website was mostly used as an academic, specifically programmatic, information source. The college website was recently updated to show the required courses for any of the credentials offered at Ivy Tech; not all of that information had been available previously. Notably, being invited to participate in the Next Level Jobs program prompted some students to investigate the Ivy Tech website. One student used the Ivy Tech website after being prompted by an invitation to participate in the Next Level Jobs program:

> Really, once I found out about the program, I went to Ivy Tech's website and just kind of investigated exactly what [enrollment in the program] would entail. When I enrolled, it was actually really quick. I got an email about the opportunity and the actual program to take advantage of it. It started the next week, so I enrolled. I think it was Friday, and the program started the following Wednesday.

This example shows the power of the school website and how it can quickly assist students in making decisions about academics. Another student who enrolled in Ivy Tech through the Next Level Jobs program expressed a similar sentiment:

> Prior to enrolling, I did my own research, because, you know, I got the email. And then I looked into it: I looked into the grant, I looked into what the requirements would be, how plausible it would be with my like, schedule. So, just using Ivy Tech's website.

Students were using different online resources, and to varying degrees, and some more successfully than others. Vagueness was common in describing their usage of online resources, but that may be due to the ease with which the internet allows users to search for information. Something to consider as well is the nature of the participants, namely, that most of them were "tech-y," which may have made them more likely to use the internet as a resource than their peers enrolled in non-IT programs.

Conclusion and Recommendations for Practice

Students are required to make many decisions as they move through their education in community college. Our research demonstrates that students primarily relied on information from three distinct sources: (1) personal social networks, (2) online resources, and (3) institutional networks. Many participants used more than one source of information during their decision-making processes. Students ran decisions, especially program and career decisions, by people in their personal social networks. They relied on the advice of family members, friends, and people from their high schools or jobs. They also conducted a lot of their own research online, using the school website for assistance in making programmatic choices and relying on popular job sites like Indeed, Glassdoor, and LinkedIn for career searches. Many students also turned to their institutional networks, especially instructors and advisors, when approaching both programmatic and career decisions.

The key findings from our interviews with Ivy Tech students suggest several recommendations for practice that we encourage faculty, administrators, and advisors of community college technician education and other workforce-related programs to consider. These findings include: 1) students are using the Ivy Tech website for programmatic and course information, 2) students are looking toward their faculty and instructors for career guidance, and 3) students are talking with their family and friends about which potential programs to enroll in. These three major takeaways motivate the following recommendations for practice:

Keep institutional websites updated and accessible. The official Ivy Tech website is a major source of information for students. They especially rely on the website as an important resource for discovering academic information, such as program requirements and classes offered. The website has recently been improved to show all course requirements for every credential available at Ivy Tech; this is beneficial information for students and should be routinely updated.

Create and maintain opportunities for instructor-student mentorship. Instructors were also important sources of information for many interviewees. For some students, instructors became informally established mentors once personal connections were made. Students appreciated the real-world expertise of instructors, many whom still work in the field, as well as their deep knowledge about IT-specific program requirements. In many cases students received local job market information and were connected with local employers through these relationships. Developing activities for more formal mentorship between instructors and students would likely be beneficial, and it may open this avenue of networking to more students.

Encourage employer-student activities and networking events. It would be beneficial to expand the connections and relationships among local employers, instructors, and students. Since it is more difficult for students than it is for instructors to develop and foster relationships with employers, developing activities specifically for students to network with local employers would be helpful to give the two groups direct access to one another.

Maintain communication between instructors and advisors. It can be difficult for advisors to know all

information about each of the IT programs, but open lines of communication help. Some students expressed that they felt as though general advisors gave them misleading or inaccurate information about the IT programs, and that they did not fully understand the intricacies of the IT job market. Setting regular meetings for instructors and advisors to communicate about program and course requirements helps decrease confusion and, ultimately, inaccurate information.

Maintain virtual advising. Online advising has been a successful endeavor; students appreciate its flexibility and accessibility. Ivy Tech and institutions beyond should consider offering or continuing to offer virtual advising and continue to improve it.

Appendix 1. Survey Sampling and Response Rate

We surveyed students at Ivy Tech Community College during the Fall 2018, Spring 2019, Fall 2019, Fall 2020, and Fall 2021 semesters. In Fall 2018 we surveyed both first-semester and third-semester students. We recruited students predominantly through Informatics 109 (INFM 109). This course was chosen because it is a requirement for every IT student, and they typically take it in their first semester. The course introduces the students to terminology, concepts, theory, and fundamental skills that they will use throughout their classes in IT at Ivy Tech. In Fall 2018, we also included some other 100-level and 200-level courses to capture students who were in their third semester at Ivy Tech. These classes were chosen across Ivy Tech IT to sample students from different programs. We predominantly used INFM 109 to survey first-semester students, but we also surveyed many first-semester students in IT Support 135 and Network Infrastructure 115. We surveyed third-semester students primarily from 200-level courses such as Software Development 240, Network Infrastructure 215, and three 200-level computer science courses. After the first round of surveys in Fall 2018, we only surveyed students from INFM 109. To avoid repeat survey taking, we only recruited for third-semester students one time, Fall 2018. We tried to avoid recruiting students from asynchronous online courses out of concern that doing so would have deflated our response rate (though a couple may have been introduced to the survey). We instead chose to recruit from classes that had a synchronous component because faculty could make time during the class for students to take the survey.

We deployed student surveys a total of four times (Fall 2018 into Spring 2019, Fall 2019, Fall 2020, and Fall 2021); all surveys were deployed after the 10-day count, which is when students who were not enrolled or non-paying were dropped from the roster. Please see the table below for the response rates for each of the semesters we surveyed students.

TABLE 1. Response Rates by Semester

Fall 2018	Spring 2019	Fall 2019	Fall 2020	Fall 2021
37%	11%	20%	13.4%	28%

Our response rates may be a bit deflated because we do not know how many students were in class on the day the survey was administered. We did not ask faculty to do head counts. Therefore, our response rates are based on the number of students who were enrolled in the course after the 10-day drop period. Students may have been missing from class due to illness, stopping out after the drop period, or other unknown issues.

Appendix 2. Respondent Demographics by Semester and Year

	DEMOGRAPHICS BY SEMESTER AND YEAR					
	Fall 2018	Spring 2019	Fall 2019	Fall 2020	Fall 2021	Total
Age						
18-24	-	-	61.3%	68.6%	67.2%	65.3%
25-34	-	-	22.0%	21.9%	16.9%	20.0%
35-44	-	-	10.4%	9.5%	8.5%	9.5%
45+	-	-	6.4%	0.0%	7.3%	5.3%
Gender						
Male	74.0%	91.5%	81.0%	74.3%	79.9%	77.6%
Female	26.0%	8.5%	19.0%	25.7%	20.1%	22.4%
Race						
White/Caucasian						
Did not identify	28.2%	20.4%	19.4%	32.5%	23.3%	25.7%
Identified	71.8%	79.6%	80.6%	67.5%	76.7%	74.3%
African American/Black						
Did not identify	90.6%	95.9%	91.0%	87.9%	85.9%	89.7%
Identified	9.4%	4.1%	9.0%	12.1%	14.1%	10.3%
American Indian/Alaska Native						
Did not identify	99.1%	100.0%	98.7%	98.3%	99.4%	99.0%
Identified	0.9%	0.0%	1.3%	1.7%	0.6%	1.0%
East Asian						
Did not identify	96.5%	98.0%	95.5%	95.7%	96.3%	96.2%
Identified	3.5%	2.0%	4.5%	4.3%	3.7%	3.8%
South Asian						
Did not identify	97.7%	98.0%	97.4%	96.6%	98.8%	97.7%
Identified	2.3%	2.0%	2.6%	3.4%	1.2%	2.3%

Native American/Pacific Islander						
Did not identify	99.1%	95.9%	97.4%	99.1%	98.8%	98.5%
Identified	0.9%	4.1%	2.6%	0.9%	1.2%	1.5%
Mexican/Chicano						
Did not identify	95.6%	98.0%	95.5%	94.0%	92.0%	94.8%
Identified	4.4%	2.0%	4.5%	6.0%	8.0%	5.2%
Puerto Rican						
Did not identify	98.8%	98.0%	99.4%	99.1%	99.4%	99.0%
Identified	1.2%	2.0%	0.6%	0.9%	0.6%	1.0%
Part-Time or Full-Time Student						
Part-time	45.6%	38.5%	37.0%	47.4%	30.7%	40.8%
Full-time	54.4%	61.5%	63.0%	52.6%	69.3%	59.2%

Note: We did not collect data on age of participants during fall 2018 or spring 2019 so those data are missing from this table.

Works Cited

Absher, K., & Crawford, G. (1996). Marketing the community college starts with understanding students. *Community College Review, 23*(4), 59–67. https://doi.org/10.1177/009155219602300406

Baker, R., Bettinger, E., Jacob, B., & Marinescu, I. (2018). The effect of labor market information on community college students' major choice. *Economics of Education Review, 65*, 18–30. https://doi.org/10.1016/j.econedurev.2018.05.005

Bers, T. H. (2005). Parents of traditionally aged community college students: Communications and choice. *Research in Higher Education, 46*(4), 413–436. https://doi.org/10.1007/s11162-005-2968-z

Bers, T. H., & Galowich, P. M. (2003). Parents and the college choice process for community college students. *Journal of Applied Research in the Community College, 10*(1), 24–40. https://doi.org/10.1177/009155210202900404

Bingham, R. P., & Ward, C. M. (1994). Career counseling with ethnic minority women. In W. B. Walsh & S. Osipow (Eds.), *Career counseling with women* (pp. 165–195). Lawrence Erlbaum.

Beggs, J. M., Bantham, J. H., & Taylor, S. (2008). Distinguishing the factors influencing college students' choice of major. *College Student Journal, 42*(2), 381–394.

Bickerstaff, S., Barragan, M., & Rucks-Ahidiana, Z. (2017). Experiences of earned success: Community college students' shifts in college confidence. *International Journal of Teaching and Learning in Higher Education, 29*(3), 501–510.

Bowman, S. L., & Tinsley, H. E. A. (1991). The development of vocational realism in Black American college students. *Career Development Quarterly*, *39*(3), 240–250. https://doi.org/10.1002/j.2161-0045.1991.tb00396.x

Bourdieu, P. (1984). *Distinction: A social critique of the judgement of taste*. Harvard University Press.

Brown, D., Minor, C. W., & Jepsen, D. A. (1991). The opinions of minorities about preparing for work: Report of the second NCDA national survey. *Career Development Quarterly*, *40*, 5–19. https://doi.org/10.1002/j.2161-0045.1991.tb00307.x

Ceja, Miguel (2006) Understanding the role of parents and siblings as information sources in the college choice process of Chicana students. *Journal of College Student Development, 47*(1), 87–104. https://doi.org/10.1353/csd.2006.0003

Chin Yuk, M., Blackburn Cohen, C. A., & Hora, M. T. (2020). Examining US business undergraduates' use of career information sources during career exploration. *Education and Training, 62*(1), 15–30. https://doi.org/10.1108/ET-05-2019-0103

Chung, Y. B., Loeb, J. W., Gonzo, S. T. (1996). Factors predicting the educational and career aspirations of Black college freshmen. *Journal of Career Development, 23*(2), 127–135. https://doi.org/10.1177/089484539602300203

Community College Research Center. (2022). Guided Pathways. https://ccrc.tc.columbia.edu/research/guided-pathways.html

Creamer, E. G. (2009). The role of information in the choice of IT as a career. In M. Khosrow-Pour (Ed.) *Encyclopedia of Information Science and Technology* (2nd ed.) (pp. 3345–3349). Information Resources Management Association. https://doi.org/10.4018/978-1-60566-026-4

Creamer, E. G., & Laughlin, A. (2005). Self-authorship and women's career decision-making. *Journal of College Student Development, 46*(1), 13–27. https://doi.org/10.1353/csd.2005.0002

D'Amico, M. M., Gonzalez Canche, M. S., Rios-Aguilar, C., & Salas, S. (2019). An exploration of college and career alignment for community college students. *The Review of Higher Education, 43*(1), 53–83. https://doi.org/10.1353/rhe.2019.0090

Dougherty, K. J. (2018). *Higher education choice-making in the United States: Freedom, inequality, and legitimation* (Working Paper No. 35). Centre for Global Higher Education, UCL Institute of Education. https://www.researchcghe.org/publications/working-paper/higher-education-choice-making-in-the-united-states-freedom-inequality-legitimation/

Edwards, R. & Van Noy, M. (2020). *Student decision making about community college information technology programs and careers*. Education and Employment Research Center. https://smlr.rutgers.edu/sites/default/files/Documents/Centers/EERC/NSF-ATE_Survey_paper_1.25.21.pdf

Fouad, N. A., Guillen, A., Harris-Hodge, E., Henry, C., Novakovic, A., Terry, S., & Kantamneni, N. (2006). Need, awareness, and use of career services for college students. *Journal of Career Assessment, 14*(4), 407–420. https://doi.org/10.1177/1069072706288928

Fouad, N., Cotter, E. W., & Kantamneni, N. (2009). The effectiveness of a career decision-making course. *Journal of Career Assessment, 17*(3), 338–347. https://doi.org/10.1177/1069072708330678

Gati, I., Krausz, M., & Osipow, S. H. (1996). A taxonomy of difficulties in career decision making. *Journal of Counseling Psychology, 43*, 510–526. https://doi.org/10.1037/0022-0167.43.4.510

Goff, B., Patino, V., & Jackson, G. (2004). Preferred information sources of high school students for community colleges and universities. *Community College Journal of Research & Practice, 28*(10), 795–803. https://doi.org/10.1080/10668920390276957

Gonzalez Canche, M. S., D'Amico M. M., Rios-Aguilar, C., & Salas, S, (2014). It's who you know: Leveraging social networks for college and careers. *Community College Enterprise, 20*(1), 17–34.

Goomas, D. T. (2012). Closing the gap: Merging student affairs, advising and registration. *Community College Journal of Research and Practice, 36*(1), 59–61. https://doi.org/10.1080/10668926.2012.617652

Granovetter, M. (1983). The strength of weak ties: A network theory revisited. *Sociological Theory, 1*(1983), 201–233. https://doi.org/10.2307/202051

Greenbank, P. (2009). An examination of the role of values in working-class students' career decision-making. *Journal of Further and Higher Education, 33*(1), 33–44. https://doi.org/10.1080/03098770802638259

Hayes, M. W., & Prus, J. (2014). Student use of quantitative and qualitative information on RateMyProfessors.Com for course selection. *College Student Journal, 48*(4), 675–688.

Hodkinson, P. (2008). *Understanding career decision-making and progression: Careership revisited*. John Killeen Memorial Lecture. Woburn House.

Hodkinson, P., & Sparkes, A. C. (1997). Careership: A sociological theory of career decision making. *British Journal of Sociology of Education, 18*(1), 29–44. https://doi.org/10.1080/0142569970180102

Hossler, D., Schmit, J., & Vesper, N. (1999). *Going to college: How social, economic, and educational factors influence the decisions students make*. John Hopkins University Press.

Jaggers, S. S., & Fletcher, J. (2014). *Redesigning the student intake and information provision processes at a large comprehensive community college* (Working Paper No. 72). Community College Research Center. https://ccrc.tc.columbia.edu/publications/redesigning-student-intake-information-provision-processes.html

Jenkins, D., Lahr, H., & Mazzariello, A. (2021). *How to achieve more equitable community college student outcomes: Lessons from six years of CCRC research on guided pathways*. Community College Research Center. https://ccrc.tc.columbia.edu/publications/equitable-community-college-student-outcomes-guided-pathways.html

Johnson, R., & Stewart, N. (1991). Counselor impact on college choice. *School Counselor*, 39(2), 84–90.

Julien, H. E. (1999). Barriers to adolescents' information seeking for career decision making. *Journal of the American Society for Information Science 50*(1), 38–48.

Kahn, J. S., Wood, A., & Wiesen, F. E. (1999). Student perceptions of college counseling center services: Programming and marketing for a seamless learning environment. Journal of College Student Psychotherapy, 14, 69-80.

Keillor, B. D., Bush, R. P., & Bush, A. J. (1995). Marketing-based strategies for recruiting business students in the next century. *Marketing Education Review, 5*(3), 69–79. https://doi.org/10.1080/10528008.1995.11488519

Kelly, A. P. & Schneider, M. (2011). *Filling in the blanks: How information can affect choice in higher education*. American Enterprise Institute for Public Policy Research. https://www.aei.org/research-products/working-paper/filling-in-the-blanks/

Khosrow-Pour, M. (Ed.) *Encyclopedia of Information Science and Technology* (2nd ed.) Information Resources Management Association. https://doi.org/10.4018/978-1-60566-026-4

Kotrlik, J. W., & Harrison, B. C. (1989) Career decision patterns of high school seniors in Louisiana. *Journal of Vocational Education Research 14*(2), 47–65.

Krieshok, T. S., Black, M. D., McKay, R. A. (2009). Career decision making: The limits of rationality and the abundance of non-conscious processes. *Journal of Vocational Behavior 75*(3), 274–290. https://doi.org/10.1016/j.jvb.2009.04.006

Lease, S. H. (2004). Effect of locus of control, work knowledge, and mentoring on career decision-making difficulties: Testing the role of race and academic institution. *Journal of Career Assessment, 12*(3), 239–254. https://doi.org/10.1177/1069072703261537

Margolin, J., Miller, S. R., & Rosenbaum, J. E. (2012). The community college website as virtual advisor: A usability study. *Community College Review, 41*(1), 44–62. https://doi.org/10.1177/0091552112471844

McKinney, L., Backsheider Burridge, A., Miyoung Lee, M., Bourdeau, G. V., & Miller-Waters, M. (2022). Incentivizing full-time enrollment at community colleges: What influences students' decision to take more courses? *Community College Review 50*(1), 1–27. https://doi.org/10.1177/00915521211061416

National Science Board. (2019, September). *The skilled technical workforce: Crafting America's science and engineering enterprise* (Report No. NSB-2019-23).

Newell, S. J., Titus, P. A., & West, J. S. (1996). Investigating the undergraduate student decision-making process of selecting a business specialization: A comparison of marketing and non-marketing business students. *Journal of Business Education, 18*(Fall), 57–67. https://doi.org/10.1177/027347539601800307

Nguyen, T., Gutierrez, R. A. E., & Smith, J. (2022). Evaluating on-line resources: How community college students in STEM sort and select material on the internet. *Community College Review 50*(3), 1–24. https://doi.org/10.1177/00915521221087286

O'Neill, D. K., & Sai, T. H. (2014). Why not? Examining college students' reasons for avoiding an online course. *Higher Education, 68*(1), 1–14. https://doi.org/10.1007/s10734-013-9663-3

Rennis, L., McNamara, G., Seidel, E., & Shneyderman, Y. (2015). Google it!: Urban community college students' use of the internet to obtain self-care and personal health information. *College Student Journal, 49*(3), 414–426.

Rucks-Ahidiana, Z., & Bork, R. H. (2020). How relationships support and inform the transition to community college. *Research in Higher Education, 61*(5), 588–602. https://doi.org/10.1007/s11162-020-09601-z

Santos, M. (2004). The motivations of first-semester Hispanic two-year college students. *Community College Review, 32*(3), 18–34. https://doi.org/10.1177/009155210403200302

Schudde, L., Bradley, D., & Absher, C. (2019). Navigating vertical transfer online: Access to and usefulness of transfer information on community college websites. *Community College Review, 48*(1), 3–30. https://doi.org/10.1177/0091552119874500

Scott-Clayton, J. (2011). *The shapeless river: Does a lack of structure inhibit students' progress at community colleges?* (Working Paper No. 25). Community College Research Center. https://ccrc.tc.columbia.edu/publications/lack-of-structure-students-progress.html

Somers, P., Haines, K., Keene, B., Bauer, J., Pfeiffer, M., McCluskey, J., Settle, J., & Sparks, B. (2006). Towards a theory of choice for community college students. *Community College Journal of Research and Practice, 30*(1), 53–76. https://doi.org/10.1080/10668920500248886

Van Noy, M., Trimble, M. J., Jenkins, D., Barnett, E.A., & Wachen, J. (2016). Guided pathways to careers: Four dimensions of structure in community college career-technical programs. *Community College Review, 44*(4), 263–285. https://ccrc.tc.columbia.edu/publications/guided-pathways-to-careers.html

Worthington, R., Flores, F., & Navarro, R. (2005). Career development in context: Research with people of color. In S. D. Brown & R. W. Lent (Eds.), *Career development and counseling* (pp. 225–252). John Wiley & Sons.

Zastrow, P., & Stoner, M. (2007). Mass Appeal: How to turn your web site into a marketing engine. *Community College Journal, 78*(2).

Zondag, M.C., & Brink, K.E. (2017). Examining US college students' career information sources across three decades. Education & Training, 59(9), 978-989. https://doi.org/10.1108/ET-01-2017-0002

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