

Navigating Vertical Transfer Online: Access to and Usefulness of Transfer Information on
Community College Websites*

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issue of COMMUNITY COLLEGE REVIEW at <http://journals.sagepub.com/home/crw>

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Acknowledgments: The research reported here was supported by the Greater Texas Foundation. The authors thank Catherine Hartman, Saralyn McKinnon-Crowley, and Danielle Thoma for research assistance and John Fink and Davis Jenkins for their thoughtful feedback on the paper. All opinions and any errors are our own.

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Abstract

Objective: To transfer, students often must navigate complex and imperfect information about credit transfer, bureaucratic hurdles, and conflicting degree requirements. This study examined how administrators and transfer personnel think about institutional online transfer resources and examined community colleges' online transfer information.

Methods: For a sample of 20 Texas community colleges, we spoke to key transfer personnel about the information provided to students and reviewed college websites, assessing the ease of access and usefulness of online transfer information. We used a qualitative case study approach to triangulate findings from our data sources.

Results: Approximately two-thirds of colleges in the sample fell below the highest standard on our rubric for either ease of access or usefulness, indicating room for improvement at most institutions. Many personnel recognized the strengths and limitations of their college's online information, though several were ambivalent about the need for improving online information, arguing that online information is not as promising an intervention as face-to-face advising.

Conclusions/Contributions: Our research illustrates the need for colleges to develop and update their online information intentionally, determining which information students need in order to transfer (including transfer guides for partner programs/colleges) and how students might search for that information, and ensuring that necessary transfer information is available and up-to-date. The framework provided by our website-review approach, coupled with a proposed rubric to assess ease of access and usefulness of transfer information, may guide institutions in their evaluation of their online transfer information.

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More than a third of college students begin postsecondary education at a public two-year college (National Center for Education Statistics, 2014). Given that community colleges enroll a disproportionate number of Black, Hispanic, low-income, and first-generation college students, the success of community college entrants has important implications for equity in educational attainment and social stratification (Schudde & Goldrick-Rab, 2015). Nationally, 80 percent of first-time community college entrants aspire to earn a bachelor's degree, but fewer than one-third transfer within six years, and only 13 percent complete a bachelor's degree in that time frame (Horn & Skomsvold, 2011; Shapiro et al., 2017). The *transfer function* of community colleges—the vertical transfer pathway that allows students to transition to a four-year institution—is not optimized; many students fail to achieve their educational goals (Bailey, Jenkins, Fink, Cullinane, & Schudde, 2016; Taylor & Jain, 2017). Although explanations for the faulty transfer function are varied, scholars, policymakers, and practitioners seem to agree that a lack of transparent transfer pathways contributes to confusion among both students and the people students turn to for help (Bailey et al., 2016; Fink & Jenkins, 2017; GAO, 2017; Hossler et al., 2012).

Recent research highlights the increasingly important role online information plays in helping students navigate college (GAO, 2017; Jaggars & Fletcher, 2014; Margolin, Miller, & Rosenbaum, 2013), as described in our literature review. Although students arrive on campus with varying levels of certainty about intended major and degree goals, nearly all students require transparent information to inform their educational decisions. For this study, we

examined staff perceptions of the online transfer information offered to students as they navigate community college. We also collected and analyzed online transfer information provided on community college websites, assessing its ease of access and the usefulness of its content.

In this paper, we first describe the transfer challenges students face in finding appropriate information to guide them through the process, as well as the particular circumstances of transfer in the state of Texas, where our study takes place. We then describe our research methods and results. We conclude with a discussion of the implications of our findings along with recommendations for practice, including how colleges can assess the quality of their online information about transfer.

Structural Problems and Information Constraints

The process of postsecondary transfer is fraught with bureaucratic hurdles and complex information. Transfer-intending students must navigate the requirements of both the college in which they are currently enrolled and their prospective destination institution. Confusion about course and degree selection and credit transfer is one of many hurdles students face in navigating the transfer process (Person, Rosenbaum, & Deil-Amen, 2006). Key barriers to transfer include opaque transfer policies, insufficient information related to credit portability, and insufficient support services to promote and maintain progress on streamlined pathways (Bailey, Jaggars, & Jenkins, 2015; Bailey et al., 2016). Thus, although our study focuses on how information is presented to students online and staff perceptions of those resources, we recognize that this is one piece of the complex puzzle that comprises improving transfer outcomes.

Prior research suggests that many community college students appear to have incomplete or inadequate information as they navigate transfer (Allen, Smith, & Muehleck, 2014; Schudde, Jabbar, & Hartman, 2017). We refer to students' lack of the information necessary to prepare for

and achieve their educational aspirations as *information constraints*.¹ The pathway to a baccalaureate degree through community college involves an overwhelming number of choices that must be made by students who have information constraints and, sometimes, little direct guidance from advisors. In a review of evidence about structural barriers at community colleges, Scott-Clayton (2011) argued that the combination of too many choices and bureaucratic obstacles may result in poor decisions, loss of time and money, and, ultimately, movement away from the credential the student intended to earn. She described the difficulty students face in tracking down the information necessary to navigate college and relevant transitions, stating:

Logistically, just obtaining all of the information needed to make wise course choices can be difficult. Information about course content and prerequisites is often located in one place, while course schedules are in another place, and the requirements for specific degree programs are spelled out in yet another location. (p. 5)

This difficulty with finding necessary information supports the narrative of prior research on challenges students face in the transfer process and in attempts to find adequate information through advising (Allen et al., 2014; Davies & Dickmann, 1998) or through elaborate information-gathering as individuals (Schudde et al., 2017).

To adequately support transfer, institutions must illuminate transfer requirements during each phase of students' educational trajectory—as they make course enrollment decisions, declare or change majors, consider potential destination colleges/programs, and attempt to transfer credits. Recent research on college structures highlights the scaffolding that colleges can build to support students, including disseminating dissemination, advising, and providing clear milestones that allow students to move efficiently toward their goals (Bailey et al., 2015; Fink &

¹ We are not the first to use this term in the context of higher education; Scott-Clayton (2012) used a similar definition in reference to student information about financial aid. We are the first—to our knowledge—to use it in the context of institutional transfer.

Jenkins, 2017; Rosenbaum et al., 2007). State policies and organizational contexts may influence how community colleges provide information to students and staff.

In their study of transfer policies in 10 states, Hodara, Martinez-Wenzel, Stevens, and Mazzeo (2017) argued that states with “institution-driven” transfer systems often leave room for error, because advising staff must customize advising from various transfer planning guides (p. 344), unlike states with more transparent 2+2 systems, where lower division courses align across the higher education system (p. 339). Texas—from which our sample is drawn—would fall into the institution-driven category. After reviewing state policies and interviewing more than 50 community college and university staff in Texas, Bailey et al. (2016) argued that students and advisers must rely on conflicting and out-of-date information from various sources, including institutional websites and the state coordinating board’s website, to navigate the complex system of credit transfer and articulation agreements.

To help students overcome information constraints, the Government Accountability Office (GAO) argued in 2017 that the information about transfer should be easy to locate and interpret, well organized, and complete. For example, institutions could, among other strategies, develop and present *transfer program maps* that include the preferred courses students should enroll in at the community college, a suggested course sequence, and major-specific prerequisites at the university in efforts to align with recommended best practices for effective two- and four-year college partnerships (Fink & Jenkins, 2017). But to what extent do current practices related to transfer align with these ideals and purported best practices? In an attempt to answer that question, we next review the literature on transfer advising and online information at community colleges.

Institutional Interventions to Overcome Information Constraints

Stakeholders in higher education acknowledge that navigating transfer is difficult given the challenges posed by bureaucratic hurdles, complex and opaque information, and inadequate support services. State-level policies, which we describe later, largely develop structures to determine how credits transfer, but those interventions do not guarantee that relevant information will be disseminated to students clearly and coherently. Transfer pathways available to students are deeply entangled with the way in which institutions distill and disseminate information about credit portability (Hagedorn, 2010; Townsend & Wilson, 2006). The primary means of providing information to students is through advising and publicly available information, but recent research suggests a wide variation in access to and quality of both transfer advising and publicly available information about transfer (GAO, 2017).

Advising. Many students voice the need for greater support as they attempt to navigate the transfer process (Allen et al., 2014; Davies & Dickmann, 1998; Herrera & Jain, 2013; Jain, Bernal, Lucero, Herrera, & Solorzano, 2016; Jain, Herrera, Bernal, & Solorzano, 2011; Senie, 2016). Some institutions offer specialized services to guide transfer-intending students, including transfer-specific advisors, centers, and events; but the quality and availability of those resources vary (Bailey et al., 2016; Hodara et al., 2017). College personnel are one means by which vital information about transfer can be disseminated; for one thing, they can introduce students to transfer guides or structured “maps” that guide movement from one institution to another. Many community colleges, however, are unable to meet the demand for effective transfer advising (Allen et al., 2014; Bahr, 2008; Davies & Dickmann, 1998).

Based on interviews with stakeholders in higher education, the GAO (2017) argued that students often struggle to obtain adequate advising and information needed to plan their path (p.

12). Plagued by high student-to-advisor ratios and resource constraints, most community colleges are unable to provide holistic, one-on-one advising to every student (Bahr, 2008; Schudde & Goldrick-Rab, 2015). Unfortunately, community college students and advisors cannot rely on four-year institutions to fill the void in transfer-specific advising; some four-year institutions are reluctant to collaborate, and others face resource constraints similar to those seen in the public two-year sector (GAO, 2017, p. 13; Herrera & Jain, 2013). Given barriers to the face-to-face transmission of transfer information, it is likely that a different tactic is necessary to ensure the availability of high-quality transfer information for all students. Online information may be a reliable alternative, but evidence suggests that many community colleges are not providing adequate information for students through this medium.

Online content. College websites are an important tool for conveying institutional and program-specific information to students, but the quality of and ease of access to information seems to vary across institutions (GAO, 2017; Jaggars & Fletcher, 2014; Khlaisang, 2017; Margolin et al., 2013). Postsecondary institutions increasingly use websites to share consumer information. The federal Department of Education requires institutions to post credit transfer policies and other disclosures, such as net price calculators, online (GAO, 2017). However, colleges do not have to disclose which institutions they have articulation agreements with or present other transfer information (GAO, 2017, p. 32). Posting the information online would potentially make it more accessible to prospective and current students than does making handouts available on campus (GAO, 2017).

Eleven percent of community college students rely primarily on their college's website as their main source of academic advising (Center for Community College Student Engagement, 2018, p. 7). When students cannot locate correct information about college policies and

procedures on those websites, they struggle to find answers that they need to proceed toward their educational goals (Jaggars & Fletcher, 2014; Nodine, Jaeger, Venezia, & Bracco, 2012; Van Noy, Trimble, Jenkins, Barnett, & Wachen, 2016). In a case study assessing how a Midwestern suburban community college reformed student intake processes and how it provided information to students, Jaggars and Fletcher (2014) found that many students were confused by online resources and struggled to find necessary information. Advisors on the campus confirmed that online information resources were difficult to locate and sometimes inaccurate, contributing to student difficulty in identifying useful information. Research suggests that many community college students encounter some trouble in locating or understanding online information, which Margolin, Miller, and Rosenbaum (2013) termed “usability problems.” They asked students to answer questions about occupational degree programs; tasks included identifying the program list, required courses, program duration, and other relevant program information. Most students in the study experienced some usability problems, of which more than one-third were related to finding information, while one-half were related to understanding the information (p. 52).

Based on their findings, Margolin et al. (2013) suggested that colleges make online information explicit and conclusive rather than expecting students to synthesize information from different pages. They also encouraged schools to pay greater attention to effective website organization, for example by avoiding dense lists of abbreviations and codes. Others have similarly argued that colleges should aim to design usable websites to adequately present information to students and other users. Şengel (2013) defined “usable” websites as ones on which where users can find or achieve what they want without problems or requiring help (p. 3247). Khlaisang (2017) suggested that college websites should be designed with users’ needs in mind, assessed with a usability test, and modified to improve usability based on results. Practical

guidance on building a usable website for colleges is hard to find, because there is a dearth of research on college websites in the United States (e.g., Şengel's research took place in Turkey and Khlaisang's in Thailand). Colleges could aim to comply with Web Content Accessibility Guidelines (<https://www.w3.org/WAI>) to improve accessibility for people with disabilities. From there, websites would probably require additional work to test and tweak content to ensure it is usable, following the example of website usability research. To date, Margolin et al.'s (2013) research is the only similar study performed on college websites in the US, though it suffered from some limitations compared with Şengel's (2013): For example, the researchers did not capture students' time to complete tasks—a measure of efficiency—and had a small sample size.

In 2017, the GAO became interested in the transparency of the college transfer process and reviewed the websites of a nationally representative sample of colleges ($n = 214$), along with interviews of 25 stakeholders from colleges ($n = 8$) and higher education organizations ($n = 17$). The website review suggested that college websites vary dramatically in their ease of access and clarity of online transfer information. The GAO argued that students would better understand their transfer options if appropriate information were online. The findings illustrate a systemic lack of available and useful information to guide students in their transfer efforts.

Although several scholars argue that more transparent information would probably improve transfer outcomes for students (e.g., Bailey et al., 2016; Jenkins & Fink, 2017), no clear evidence links online information to student success. We are not aware of any work that examines the influence of online information on students' outcomes, whether related to transfer or to other topics. To produce such evidence, scholars would first need to determine how to assess the content of websites and the quality of the information presented and then link those institutional measures to student-level data. We see our study—which assesses the ease of access

and the usefulness of content—as a step forward in the literature. Improving online information is not the sole solution, given that many students would probably benefit from guidance to help them interpret transfer information. Still, it seems like a necessary step to ensure that students, as well as the advisors, faculty, family members, and community members who support them, have accurate information about transfer options, processes, and policies.

Although the GAO's (2017) report highlighted the perspectives of knowledgeable stakeholders and the inadequacies of many college websites, their evaluation did not focus on community colleges. As such, it did not consider the organizational context within which community colleges are situated. Community colleges operate within larger state contexts. Their relationships with other institutions, namely public universities and overarching governing bodies, shape the environment and the responses available to community colleges. In this paper, we add greater depth to the discussion, illuminating variation in ease of access and usefulness of online transfer information within a statewide community college context. We closely examine how institutional agents disseminate and perceive transfer information in the complex community college system in Texas and review online transfer information provided by 20 Texas community colleges.

Texas Context

Eighty-one percent of Texas community college students enroll in transfer programs, but fewer than a quarter of transfer aspirants end up transferring, a pattern that closely mirrors national trends (THECB, 2014). Transfer of credits between institutions is a common policy concern: Three quarters of bachelor's degree recipients took at least some credits at a Texas community college (THECB, 2014). Texas employs several initiatives to improve success among transfer students, including a general education core comprising coursework that should

transfer across public institutions and additional lower-division coursework that students can add to the core to ensure that their credits in specific majors will transfer.

In Texas, the *core curriculum* is a set of courses that provide students with breadth of knowledge and, as mandated in state policy, are universally accepted at public colleges statewide. The core curriculum and Field of Study (FOS) curricula, comprising additional lower-division coursework (available for only nine major fields) that must transfer between colleges, are mandated. The FOS and the core should eliminate course duplication for students who switch between Texas's public postsecondary institutions. In practice, the core, on its own, does not create a seamless transition between colleges because baccalaureate requirements vary by major. Thus, lower-division coursework may not count toward a degree in a given major (Bailey et al., 2016). This remains a conundrum among reformers who want to improve the transfer process, and it highlights the importance of providing information to students to ensure that they understand the various intersecting requirements of their desired transfer plan and major.

Other initiatives in the state, such as *transfer agreements* (also called *articulation agreements*), are “encouraged, but not required” (THECB, 2014, p. 3). Articulation agreements are used to negotiate the requirements for students to move between institutions (Anderson, Sun, & Alfonso, 2006). Texas transfer agreements are “bilateral”—occurring between individual institutions—and thus leave students and advisors to navigate specific agreements between colleges and programs (Root, 2013). For that reason, these agreements vary in availability and quality based on which college and which program students transfer to and from.

The Texas public higher education system comprises 80 two-year institutions and 39 four-year institutions, including a number of different university and college systems, each with its own chancellors (at the system level) and presidents (at the college level), according to

THECB (2017). Ten governing boards oversee the public universities—six govern the six university systems² and four govern the remaining independent public universities (Perna & Finney, 2014). The two-year sector comprises the Texas State Technical College system, two-year colleges run by the Texas State University system, and Texas community colleges. The community colleges include a mixture of community college districts, each with its own board of trustees, and independent community colleges, for a combined total of 50 community colleges with more than 70 campuses (Perna & Finney, 2014, p. 143). These 119 entities together form the public higher education pipeline for both vertical and horizontal transfer.

Given the complex mass of higher education institutions, The Texas Higher Education Coordinating Board (THECB), a governor-appointed, public agency with regulatory powers, was established in 1955 (Berdahl, 1971). Although the THECB was legislatively established with the goal of coordinating institutions, its authority does not supersede institutional or system governing boards (p. 18). Historically, institutional leaders demonstrate resistance to some THECB efforts, emphasizing the autonomy of their institutions (Berdahl, 1999). The geographic, demographic, and institutional diversity also present challenges, along with a state culture that prioritizes local control (Perna & Finney, 2014). The push and pull among the coordinating board, the legislature, and the individual systems and institutions in Texas produces an ongoing tension that shapes policy formation and implementation.

Most colleges engage in a number of practices to facilitate transfer, but often they must do so with limited resources and without a perceived statewide mandate or coordination. As a

² The state includes six state university systems, each comprising multiple universities: University of Houston, University of North Texas, University of Texas, Texas A&M University, Texas State University, and Texas Tech University.

result, personnel acknowledge that practices and policies are often developed quickly—typically when a college receives either additional funding or complaints about inadequate compliance with state policies, such as those related to the core and FOS (Bailey et al., 2016). Furthermore, like other states, Texas continues to lack incentives for institutions across the two-year and four-year sectors to work together to improve transfer via clear transfer/degree pathways and efficient implementation of existing transfer policies (Bailey et al., 2016). This puts much of the burden on community colleges to gather and provide clear and transparent information to transfer-intending students in order to improve their probability of attaining educational goals.

Research Questions

Our study examined online transfer information at Texas community colleges. We asked the following interrelated research questions:

1. How do administrators and transfer personnel think about the dissemination of transfer information? How do they perceive the value of online transfer information and its ease of access and usefulness at their institution?
2. How easy to access and useful is transfer information offered on community college websites?

Methods

To answer our research questions, we interviewed college administrators, advisors, and other transfer personnel and reviewed college websites, collecting detailed data about how we located transfer information and about the type and quality of information provided, at 20 Texas community colleges. We used a qualitative case study approach, triangulating our findings using multiple sources of data (Maxwell, 2012). Prior to collecting data, we submitted our interview

protocol and data collection plan to our Institutional Review Board, which deemed it exempt, since it concerned transfer policies and college practices but did not include student-level data.

Site Selection

Using data obtained from National Student Clearinghouse (NSC), we followed Jenkins and Fink's (2016) recommendations for producing "transfer-out rate" and "transfer-out bachelor's completion rates" for each community college in the state (p. 8).³ Transfer-out rate captured the percentage of fall 2007 entrants who transferred to a baccalaureate-granting institution within six years of initial enrollment. Bachelor's completion rate captured the percent of transfer students among fall 2007 entrants at that community college who earned a bachelor's degree from any four-year institution within six years of enrollment.

Using purposeful selection (Maxwell, 2012), we aimed to include adequate representation among colleges where few students transferred to four-year colleges compared with other colleges in the state and where many transferred, while acknowledging that transferring out does not ensure transfer success—some students who transfer do not earn a bachelor's degree. To capture variation in transfer-out and baccalaureate attainment rates for our college sample, we identified four types of community colleges that require representation (five per category, 20 colleges total): 1) colleges with the lowest transfer-out rates, 2) colleges with high transfer-out rates (above the median) and low bachelor's completion rates, 3) colleges with high transfer-out rates and middling (modest) bachelor's rates, and 4) colleges with high transfer-out rates and high bachelor's rates. Table 1 provides descriptive information for each college in the sample,

³ Access to the data was provided through an agreement between the Community College Research Center and the NSC.

including their categorization based on NSC transfer outcomes. To protect the identities of interview participants, we have anonymized the names of the colleges.

Interviews

In spring 2016, we used online directories and referrals to identify college personnel who serve transfer-intending students. We interviewed representatives from 18 colleges (two colleges did not respond to our inquiries; both colleges had low transfer-out rates). In most cases, we interviewed one staff member per college (at 13 colleges). When possible, we interviewed more than one staff member (at five colleges). Our final interview sample included 26 community college personnel. Seventy-three percent of the sample were women. Participants held a variety of positions related to transfer; they were academic advisors (5), transfer specialists (2), transfer center directors (6), academic advising directors or team leads (6), and administrators who oversaw student services and/or facilitate articulation agreements (7).

The first and second author performed semistructured telephone interviews that lasted approximately one hour. The interview protocol included questions about barriers that prevent students from transferring and college practices related to vertical transfer, such as the services available, how students find out about transfer options, and perceived obstacles to transfer success. For this paper, we focused on a subset of questions that asked about information provided to students to help them navigate transfer, including advising practices, online information, and the perceived ease with which students could access and use transfer information. For instance, we asked which sources of information about transfer requirements advisors use and which sources are provided to students, with probing questions focused on whether the college offers a central source of information for students (including websites, handouts, or brochures), how students can access that information, how understandable the staff

member thinks it is for students, and whether the staff member thinks students use information from other sources, such as the THECB or universities.

We recorded and transcribed the interviews and took detailed notes during our interviews, including our impressions and interpretations of the content. We first coded each transcript using broad organizing themes that included state policies (e.g., the core curriculum), online information, transfer services, barriers students face in transferring, and perceived responsibility for those barriers. The research team met frequently throughout the coding process to ensure consistency across coders and that all relevant excerpts were captured in our first wave of coding. We then used relevant excerpts (those that aligned with our goals in this paper, including ones that addressed online information, transfer services, and barriers faced by students) to further distill our findings. We created one memo per interview to develop finer-grained themes from the excerpts as they emerged, analyzing the staff's perception of online information at their college and, more broadly, the usefulness of websites for presenting information about state and institutional policies, and how students at their college use online information. We double-coded the memos, checking each other's results and resolving disagreements through discussion. Finally, we performed a final wave of analysis by pulling out themes across the memos (and thus across the interview sample), which allowed us to examine how community college transfer personnel value online transfer information compared with other means of information dissemination and to examine their perception of the ease of access and the usefulness of the information provided by their institution (RQ1).

Website Review

In summer 2016, we reviewed the websites of each college in the sample. To assess the college's online transfer information, two coders (the second and third author) collected detailed

evidence about the ease of access to and the usefulness of transfer information. We developed two related constructs—ease of access and usefulness—to assess online transfer information. We assessed the two constructs separately because some colleges had easy-to-locate information that was ineffective because it was incomplete (not offering necessary information), unclear, disorganized, or out-of-date. We defined *ease of access* by how easy online transfer information was to locate, assessing the process students must go through to find it. We defined *usefulness* as presenting necessary information to support transfer (appropriate contacts, guide to transfer processes/services at their institution, institutional partners, transfer guides) and based on the quality of the content (organization, accuracy, and datedness).

Data collection. We entered the data from the website review into a separate spreadsheet for each college. Throughout the data collection, the research team met frequently to discuss challenges, ensure consistency, and resolve disagreements about codes. Below, we describe the coding process and the information collected for each construct.

Ease of access. To collect information about ease of access, we started each search on the institution's home page, where we attempted to locate transfer information by going through the drop-down menus and/or clicking related links on the page. When that failed, we used the college website's search tools or, as a last resort, Google to locate the information. We collected information related to the search, including the number of "clicks" it took to reach the transfer content from the college's home page, the pathway followed to identify the transfer landing page, and relevant search terms if we could not locate the information through a pathway from the home page. For the click count, we included hovering over a tab or button as a click if doing so was necessary to determine content within that link (e.g., if we hovered over "student services" to see the contents of that tab). In cases where coders entered different click counts, we

selected the lowest observed click count from the home page or search term to the transfer landing page. We counted a college as having “intuitive labels” for tabs/links to transfer information if both coders could locate the information by clicking through from the home page to a transfer landing page on their first website visit without problems. If both coders had to use the website’s search bar, we captured that as an indication of some difficulty in the process. We noted “backtracking” if both coders had to use the back button on the browser to retrace steps and seek another pathway to the information.

Usefulness. After locating transfer information, we captured the type and quality of the content. Our measures included whether the transfer landing page included contact information for students seeking additional help; explanations of transfer services/processes at the college; information on state transfer policies and partnerships with universities, including posting articulation agreements—which tend to be more administrator focused—or transfer guides/plans for students; and the number of posted partnerships with public universities. We also captured information about the quality of that information to assess how easy it would be to follow and understand, including our impression of website organization, working/broken links, and any other information that suggested the information was out of date or difficult to interpret (e.g., wordiness or complex content, if links to university partners landed on the home page instead of on a transfer page).

Analyzing website data. After collecting fine-grained information about the transfer websites in detailed spreadsheets, we reviewed the data for themes. To summarize information from the website review, each coder created a memo for each college to capture themes related to the ease of access and the usefulness of transfer information. We compared memos for each institution and resolved discrepancies across coders through conversation. Findings from the

memos for each college were entered into a matrix, with one observation per college, to further reduce data. We used the matrix to examine overall patterns across the entire sample of colleges and compared those patterns with our interview themes to make sense of results overall.

We developed a rubric that incorporates various measures and notes from our data collection as a means of assessing each construct into one rating, and we see this as a prototype for researchers/practitioners to use moving forward (see Table 2 for our proposed rubric). For each construct, we assigned each website a value of 1 to 5 in terms of how easy it was to locate transfer information. For ease of access, the highest score of 5 indicates that we located the online transfer information easily within our first visit to the college website and that it was intuitively located and labeled (although click count could vary), requiring minimal effort to get to the transfer landing page. A score of 1 indicates that transfer information was unavailable or could not be found within several minutes of browsing and searching. The usefulness rating was based on the transfer content provided on the website, its completeness and accuracy for guiding students through the transfer process and necessary requirements, and its overall organization. The highest score of 5 indicates that the website included well-organized (simple to complex patterns of clicking through material, no [or minimal] broken links), digestible (easy to understand and interpret, no overly complex language), complete information about transfer. A score of 1 indicates that the necessary information about transfer was missing.

Limitations

We focused our website review on ease of access and usefulness of transfer content. Although these elements are partially related to website design, we are better able to speak to the information provided and its quality to guide students through transfer processes. Additional inquiry would be necessary to fully assess issues in website design. Moreover, we reviewed the

websites using PCs with the browser Google Chrome. Research on navigation guidelines for websites suggests that the navigation and usability of websites often differs across desktop computers and mobile devices (Garcia-Lopez, Garcia-Cabot, Manresa-Yee, de-Marcos, & Pages-Arevalo, 2017); therefore our results cannot speak to the experience of using mobile devices to access this information.

Although we leverage student information constraints as a driving theory, in our results, we note the difficulty that some staff faced in finding accurate and up-to-date information. This highlights the fact that both advisors and students may struggle to find and use online transfer information. Although it is possible that there should be two different sources of transfer information for staff and students, our understanding of the state higher education contexts from both data sources (interviews and website review) is that there is no distinct student-facing versus personnel-facing online information regarding transfer in Texas. For this reason, we collected data on all transfer information presented, even if it was not student centered (e.g., articulation agreements that seem more administrative).

Findings

We first provide a synthesis and an analysis of our interviews with transfer personnel, which illuminate their perceptions of the quality of their online transfer information, how much they value that mode of information dissemination, and the problems they identified with online information searches. Then, we describe the findings from our review of the websites and discuss variation across colleges in the sample.

Insights From Interviews With Community College Personnel

In our interviews with community college officials, those officials described the online transfer information and other resources available to transfer-intending students at their college,

the process most students go through to navigate transfer, and barriers students face along the way. The conversations illuminated the value that institutional agents placed on providing information to students on institutional websites and, in some cases, staff biases toward students' efforts in the information search process.

Perceived value of the community college website. The majority of community college advisors we spoke with underplayed the value of the community college website as a source of information for students. Two main themes arose; both bolstered support for limiting investment in maintaining high-quality transfer information online. The first theme placed the primary burden for maintenance of high-quality and up-to-date information on university partners. The second suggested that online information was inadequate for guiding students through complex transfer processes and therefore was taken as evidence that such an investment was unnecessary. Finally, several transfer personnel noted that available online information was not student centered and was riddled with problems, assessments that may contribute to the perceived value of the information.

Reliance on university webpages. Most personnel rely heavily on university websites for university-specific transfer information, arguing that this information is more reliable than that gained from alternative sources, including their own institutions' website and online information offered by the coordinating board. This practice reflects a common sentiment among community college personnel: that universities are best positioned to offer accurate online transfer information for transfer-intending students. As one community college staff member explained, "If we can get transfer materials straight from the proverbial horse's mouth, it's always going to be preferable." At College R, whose transfer pages rated low in both ease of access and usefulness because of incomplete and missing information on transfer processes, an advisor

recommended that students browse university websites rather than the college's own. The staff member said:

So I first encourage them to go [online]; this is what I literally tell them: "If you don't know where you want to go, think of the program you want to do. Let's say it's business; if I'm shopping for furniture . . . I go look at the best furniture and then I find the best furniture in my price range." So that's how I explained to them to prioritize how they're going to search. Then they come back and they have good questions and they have more specific questions. We'll get into a little searching here, but I like to encourage them and empower them to get in there and research. So then you'll know what you don't know, and you'll have specific questions. (Director of advising)

Despite the reliance on university websites, community college personnel held mixed impressions about the ease of access and the usefulness of the resulting information. One transfer advisor acknowledged that, despite her experience, she frequently had to "dig through several sites to get to the information." Several staff members who use this information daily noted having difficulty locating transfer requirements.

Need for additional maintenance to improve online information. As we note in our findings from the website review below, online information on college websites sometimes appears to be out of date or riddled with broken links. Each institution must manage its own online transfer information, with no guidelines, oversight, or accountability for how the information is presented. When one institution changes its information, it can have a domino effect on "partner" institutions that had linked to that webpage. One advisor noted the challenges that arise in trying to keep up with various changes and acknowledged that students might suffer as a result:

Universities, just like [our college], have a tendency to move things around sometimes. And we sometimes get stuck with dead links, or the links that used to go to transfer guides is going somewhere completely different now . . . so we have to try our best to keep up on those because students can use this themselves. We encourage them to do so, but if they run into dead links and information that's not correct, then they are forced to come and see us. And that's a good thing, because then we are alerted to the fact and we can hopefully get that fixed and corrected. But on the other hand, if it's there so students can use it themselves, it's not as effective as it could be. (Advisor, College Q)

Several personnel described the quickly changing nature of transfer information as a reality of the field and came to expect that their college could not provide public access to real-time changes. One participant explained:

Courses change, course sequencing changes, updates to entrance prerequisites or entrance exams, those kinds of things change. So, what's been difficult is keeping up with all of that, and so unless you have that personal contact at a university or in a specific division sometimes that's not always the best solution, and I think that's one of the hardest things for a community college. (Director of the transfer center, College M)

Some personnel placed the blame for out-of-date information on universities, saying they were inconsistent with their own updates and made minimal effort to contact feeder colleges when changes were made. They also acknowledged that resource constraints at their own community college contributed to the problem, noting that the staff was not large enough to keep up with shifting requirements.

When broken links and other maintenance issues arise, the most accurate and up-to-date transfer information is hidden from public view. Only some community college staff—and the students routinely meeting with them—have access to ever-changing transfer requirements. The presence of out-of-date or otherwise inaccessible online transfer information undermines the goals of publicly posting the information and maintains inequality in information availability across students and colleges.

Online information may not meet students' needs. Many of the advisors we interviewed appeared skeptical about the potential of online information to improve transfer. We identified several themes related to this perception. First, several transfer personnel acknowledged that online transfer information provided on institutional websites needed to be made more readable and interpretable for students. Second, related to the current state of online transfer information, several advisors argued that online information alone is insufficient for most students and that navigating the transfer process requires face-to-face advising. Third, some

personnel expressed doubt over whether students used the online information or would do so even if it were more user-friendly. Several transfer personnel who adhered to the first line of thinking supported the need for additional investment in online transfer information, but most staff who advocated for face-to-face to advising or shared pessimism about student use of online resources indicated that investing time or money in online information would be a waste.

Online information is not student centered. By student centered, we mean that the transfer content should be accurate, relevant, and responsive to student needs. From our interviews, we gained a sense of why current online transfer information is not student centered, which helped us build understanding about what changes could be made to make websites more student centered, including issues concerning web design (related to ease of access) and the type and quality of information presented (around issues of usefulness for students).

Ideally, the community college website should help students who know what they want to do to “make sure that they’re taking the courses that they need to” (Advisor, College Q). Several college advisors noted that, even for them, finding the transfer information was a complex task and required a lot of hunting for transfer plans, degree requirements, and course equivalencies on various websites. One advisor noted a common scenario that illustrates how the information is typically organized: Students navigate through the community college transfer landing page to one that links to a partner university website, where they find a “degree planning guide.” Every course in the degree planning guide uses the university’s numbering system, so students then have to navigate to a different page to figure out the course equivalents at the community college, “which can get rather confusing for the student.”

Furthermore, institutions may post information that serves differing purposes—some intended for student use, whereas other information is not meant for students—without

distinguishing between the two. A college administrator noted that the transfer agreements linked to on their transfer page were “pretty undecipherable by students,” especially first-generation college students. In some cases, those agreements were actually memoranda of understanding with a partner university, posted on the same webpage as transfer maps intended for student use.

Often, even transfer maps might be difficult for students to interpret, requiring them to look up whether classes count toward the state’s core curriculum or field of study (if they are in a relevant major). Students might also have to seek additional information on another website run by the THECB to translate Texas common course numbers (used by the community colleges) into the course numbers used by some universities. Although the administrator noted that “all of this information is out there and is absolutely accurate and up-to-date,” she acknowledged that is admittedly probably “unreadable by a student from a first-generation household.”

Face-to-face advising is necessary. Several transfer personnel expressed the belief that students need advising to understand and interpret online information. Some advisors argued that one-on-one transfer advising was the most important means for disseminating transfer information. Others argued that advising was, at the least, an important supplement to online information, mostly as a consequence of the complexity of transfer and the inadequacy of information provided online. One advisor noted, “It’s good stuff to have online but, without the advisor, it can be so confusing,” noting that many students need guidance to find the information that they look for online. In a system where institutions are adequately resourced to ensure that *all* students receive advising, relying on the hybrid information dissemination (online and in person) makes sense. However, most community colleges cannot reach every student through one-on-one advising. Pairing face-to-face advising with online information may be ideal, but many students do not meet with advisors. In the absence of accessible and navigable online

transfer information, how can students who do not meet often with advisors find out about transfer options and requirements?

At most of the colleges in our sample, transfer information was not offered in orientation sessions. In many cases, transfer was also not incorporated as part of a regular advising session. Instead of offering all students information on transfer, colleges required that students explicitly request information on transfer. When asked where most students find out about their transfer options, several advisors acknowledged that the dissemination of information starts only after students bring it up in an advising session.

Because research suggests that the transfer process starts with early course selection (Monaghan & Attewell, 2015), this opt-in approach puts students at a clear disadvantage if they are unaware that they need to plan for transfer early in their college career. It also disadvantages students who are reticent about reaching out to an advisor and those who have time constraints that make it difficult to meet with an advisor in person. If colleges have online transfer information that is hard to find or incomplete, it is unlikely that students will in fact find that information online. Therefore, if they do not ask for it, they probably do not receive it.

Students do not take advantage of online information. Some personnel believed that their college's online transfer content was not problematic but, rather, that students were not taking advantage of the information. This belief contradicts recent research on how students gather information, which suggests that most transfer-intending students “curate” information from more than one source and almost all students look online to examine potential transfer options (Schudde et al., 2017). One participant explained his skepticism, noting:

It's easy to check Facebook every morning, but to actually go on a [community college] website and figure out what's going on with transfer stuff—I don't know that they necessarily take full advantage of that. If you know where to go, it's really easy to navigate and check that out. (Advisor, College K)

At the advisor's campus, the online transfer information was relatively easy to access from the college's home page and offered a comprehensive overview of the college's transfer services and partner universities (we elaborate on those components below). The information students needed about transferring was available online, although, from the advisor's viewpoint, students did not seek it out. Thus, a well-designed website may be only part of the solution to overcome information constraints. However, it is also feasible that students who are most likely to meet with an advisor are less inclined to rely on online information (i.e., they prefer face-to-face advising) or that those who rely most heavily on online transfer information are less likely to visit an advisor. At other colleges where personnel held similar beliefs and argued that the students fail to use available information, the online information was not easy to access. This dynamic indicates a disconnect between staff's perception of their online transfer resources and the quality of the information that is publicly available.

Although most personnel who participated in our study recognized the strengths and limitations of their online information, a few did not. For example, College C provided useful information, including major-specific transfer plans for partner universities, but the information was not intuitively located for students searching the college's website—it required navigating broken links and backtracking to find the transfer landing page (which was housed on the system-level website, not the college's). If students knew where to look, they could find it, but doing so required that they navigate through some less intuitive labels and broken links from the college's website to the community college system's website (i.e., students would need to know that the information was provided by the system rather than by the individual college). The administrator we spoke to did not recognize that students might not think to look at the system website rather than the local college website for transfer information. Another college offered

such sparse information that the transfer page was not very useful. Initially, the personnel we interviewed acknowledged, “We have a webpage that talks about transfer, but I don’t think we have too much information on there.” Yet the staff member also said:

[Students] can also go to our college webpage. Under advising, toward the end, we have a list of all the universities that oftentimes the students will go to and it’s simply links that they can click on without going to the actual website. Just go to our website and just click on one of those universities that they have interest in. Click on that link and it takes them straight to that page. (Advisor)

The “transfer-specific” page the advisor referred to linked to four universities’ home pages. Students would then need to navigate the university websites to find relevant information. This configuration places a much higher burden on students to overcome their information constraints. Sometimes it seemed that advisors’ descriptions of online transfer information were contradictory, as in this example. Advisors would note that online information was not necessary and seemed to make a value judgment that it would not help guide students, but, when asked where students can find the information they need, the default response was: “Students can find that on our website,” with a crucial caveat: if they know where to find it.

Review of Online Transfer Information

In Tables 3 and 4, we present relevant items from our matrix that helped us assess ease of access and usefulness for each college, along with our rating on each construct based on those items and on themes from our memos (Table 3 corresponds to ease of access and Table 4 to usefulness). In our discussion of the results, we rely primarily on the data from each website to identify, describe, and analyze problems in the location and presentation of online transfer information. We rely on the rubric ratings to help us describe the state of online transfer information in our sample more generally and to compare institutions with each other overall.

Ease of access. Table 3 presents several measures regarding how easy it was to locate online transfer information. We found that 12 colleges used intuitive labels for tabs and links

from their home page to help the user find transfer information, which we most often did by selecting “Current students” or a similar option. Several colleges that were a similar number of clicks away from the home page had some issues with the labeling that made them confusing or unclear; for example, at College O, the transfer information was under a label (three clicks from the home page) for transfer *to* College O, not *from* the college to another institution, which could confuse students. For four colleges, neither coder could identify a way to get from the home page to the transfer landing page without using the search bar. For two colleges, finding the transfer landing page required significant backtracking. In both cases, the information was available not on the college website, but on the website of the system, yet both colleges (Colleges C and N) otherwise provided detailed information about other college-specific services on their websites.

Based on these items and additional themes (see notes in Table 3), we rated the colleges based on ease of access (see the rubric in Table 2). Ten colleges earned the highest rating. Five colleges fell just below our highest standard for ease of access (moderate ease of access), often because of vague labels that made the information more difficult to find without backtracking, despite appropriate links being available on the main page. Colleges categorized as somewhat accessible included online information that was fairly difficult to locate. As noted above, finding the transfer information for College N, an urban college that is part of a larger community college system, required a lot of backtracking and navigating around broken links. Once we determined the “right” way to find the information from the main college page, it required six clicks—without backtracking—to get to the transfer services page from the college’s home page. We labeled three colleges as low for ease of access because both coders struggled to locate the information due to nonintuitive labeling (e.g., College R’s link for transfer guides led to the

THECB website), difficulty with broken links from the home page, or the need to wade through search returns after finding no clear path from the home page.

Even among some colleges with a rating of high for ease of access, there may be room for improvement. For example, College K is a multicampus urban community college system that offered specific transfer events and services. Locating the transfer information required the user to click on a “Degree and certificate” tab on the college website’s home page and then click on another link to find the transfer page. While the information was within two clicks from the home page, “degree and certificate” did not seem like the most intuitive label for transfer information. Hovering over the link revealed a description that the link would show users transfer options toward a degree (for this reason, we said it was intuitively labeled), but the title of the tab could still be improved for students’ ease of access.

Usefulness of transfer information. Table 4 presents several measures about the type of transfer information provided on the institutional website and the issues we faced in navigating and/or interpreting the content. Fewer than half of the college websites ($n = 9$) offered a specific staff member (individual’s email address) to contact about transfer. Occasionally, staff in our interviews emphasized that their college prioritized face-to-face advising to justify inadequate online information. In that case, we would expect to see clear contact information to help students identify personnel who could answer their questions, but that was often not the case.

Many websites offered little to no information about the specific transfer services on campus (transfer events, advising, etc.) or about processes students should go through to navigate transferring (how to choose destination colleges, course-selection strategies for credit transfer, policies that can support transfer-intending students). Six colleges failed to provide *any* information about transfer-related services or necessary processes necessary to navigate transfer

on campus. Of those colleges, only College D listed a transfer center and provided a transfer-specific office email address that students could use to reach out.

We noted organizational issues on six websites and broken links on nine. In some cases, broken links were minimal in number compared with the high volume of information and links to external websites (e.g., College K had more than 40 links to partner institutions; almost all were functional and led directly to a transfer landing page, but two were broken). This contributed to our deciding that, for the usefulness rubric, even if some colleges had a few broken links, the online transfer information might otherwise be rated as high, especially if the content was comprehensive and clearly written.

Colleges vary widely in terms of the number of partnerships listed with public universities in the state (we use the term *partnership* here, rather than *transfer agreement*, because some colleges include links to universities they perceive as partners—either because of the volume of students matriculating there or because the college holds an agreement with that institution). In displaying those partnerships, we found that many community colleges offered direct links to university websites as the primary means of providing transfer information. In some cases, links led students to transfer admissions pages, articulation agreements, and degree plans—all relevant to transfer, though some are more relevant to students than others. Sometimes the link to a partner university led to the university’s home page, which would require the student to navigate yet another website to find relevant transfer information.

Using the items from our website review and themes from our memos, we gave nine colleges the highest rating on usefulness. For example, we rated College K as high for usefulness because the transfer landing page outlined potential degree plans and provided clear information about how to seek help from an advisor. Overall, the website offered succinct initial information

in plain language, followed by more detailed information as we clicked to get more information. Eventually, interested users can locate specific articulation agreements and transfer guides to find all the information necessary to transfer to a preferred destination university.

We rated three colleges as moderately useful because they provided the information necessary to guide students through transfer processes and policies but would have benefited from greater organization or detail. It appeared that the website materials were updated less frequently than at colleges with high usefulness (e.g., they had considerably more broken links, which is often an indication of out-of-date material).

Most colleges included at least some necessary transfer information, but on several websites, the information was inadequate, disorganized, riddled with broken links, or otherwise out-of-date. Colleges that had somewhat useful transfer information ($n = 3$) mostly suffered from incomplete information (seemingly accurate, but with some glaring holes in information or with overly complex language) or disorganization that made the information difficult to follow. We rated four colleges as low on the usefulness construct, mostly because of excessive broken links and absent material, which made it difficult to find any adequate or accurate transfer information among what was posted. The colleges that we rated as low for usefulness included very little information to guide students in the transfer process—typically only a listing of “partner institutions,” with links that frequently were broken (or, in some cases, led to the wrong institution). One of the 20 colleges failed to post any transfer information. It seems unlikely that students would be able to obtain necessary information for transferring from colleges in the bottom three ratings in our usefulness construct, as the information was missing, incomplete, or otherwise inadequate to provide actionable steps and requirements to guide them in their process.

Discussion and Implications

Easy-to-access and useful online transfer information is a potential means of helping students to overcome information constraints that may otherwise pose hurdles to navigating transfer. Extant research suggests that some students, particularly those with fewer financial and social resources, are disproportionately affected by bureaucratic hurdles and information constraints related to navigating college (Crisp & Nuñez, 2014; Dougherty & Kienzl, 2006). In this project, we examined the extent to which community colleges make transfer information easy to find and whether that information is sufficiently clear and complete to guide students through transfer options and requirements. We contribute to the literature by illustrating the variation in the quality of online transfer information and by incorporating the perspective of community college advisors and administrators on the dissemination of transfer information.

Our findings from the website review illustrate that most community colleges could improve the ease of access and the usefulness of their online transfer information. Overall, we identified wide variation in both constructs we examined. Half of the colleges provided online transfer information that was fairly easy to locate (high ease of access) and almost half included information that was comprehensive and well-organized (high usefulness). Thirteen of the colleges fell below the highest standard on at least one of the constructs. We found many broken links, in addition to disorganized and incomplete information.

Looking back to our interviews, several staff noted that they struggled to locate transfer requirements on university webpages. Locating transfer requirements is certainly more difficult for college students who have less experience mining transfer information. Additionally, several personnel noted that much information about transfer is not student centered—what is posted may not be meaningful or easy to interpret for students. Therefore, even when colleges in our

sample performed quite well on our metrics for ease of access and for usefulness, it is still feasible that students at those colleges may struggle to interpret the available transfer information. This difficulty may be part of the reason some advisors argued that face-to-face advising should supplement online information. It also means that even colleges we find to be exemplars still have work to do to ensure that information is readable and easy to interpret.

The interviews illuminate additional hurdles to the public display of information. The perspectives of staff at a given institution may shape the presentation of information to students. If personnel are convinced that online information is not used by students, they may not support additional investment. Colleges with staff that prefer face-to-face advising may invest fewer resources into presenting information online, as several transfer personnel reported that their office was in charge of updating online transfer information. Making updates would likely require them to invest their time.

Although our data do not allow us to determine how those practices influence student outcomes, it seems likely that colleges that do not maintain detailed online information about transfer pathways and services may disadvantage students, especially those who do not meet regularly with advisors. Our findings highlight the need for well-designed transfer websites. Given the decentralized nature of Texas higher education, it would be difficult for the state to offer one repository of transfer guides, as smaller and more centralized states do (e.g., the website maintained for students in the Virginia Community College System includes clear transfer requirements for several colleges in one location). However, it seems likely that the current system in Texas—where there is little emphasis on or accountability for maintaining transparent and up-to-date transfer information online—is disadvantageous to students.

In a decentralized postsecondary context, students need to know about the varying requirements at potential destination colleges. In Texas, students cannot assume that their lower-division coursework will apply in the same way at different institutions. Given all the possible combinations of programs and universities, it is impossible for advisors and students to be well informed about every option. Many community college personnel and students rely on online resources to navigate transfer requirements (Bailey et al., 2016; Schudde et al., 2017). Therefore, there is tremendous value in maintaining those webpages. Yet many institutional representatives acknowledge that their websites are not kept up-to-date, meaning prospective transfer students may follow inapt advice in their attempts to comply with university preferences or requirements.

Implications for Practice

Our results suggest that most community colleges have some work to do, both to present online information in a way that makes it easy for students to locate it and to offer the information necessary for students to navigate transfer. We list several steps colleges can take to assess and improve online transfer information.

1. We recommend that transfer personnel review their college websites yearly to assess the ease of access and usefulness of transfer information, collecting measures like those outlined in Tables 3 and 4. With the information collected, they will be able to see weaknesses and areas for improvement. For multi-institutional systems, they can also examine variation across campuses using measures of the overall rating rubric (Table 4) and should consider whether students can access transfer information from campus and system websites (if they operate separately).
2. Annual assessments, as noted in recommendation 1, will identify weaknesses in the online transfer information. Colleges must then assign a staff member to address

those problems. For instance, they must fix broken links, remove and/or update information found to be out-of-date, and work to clarify confusing information.

3. Colleges would do well to post transfer guides for institutions with which they hold articulation agreements. Ideally, this would provide a road map of courses that will count toward a desired degree for students transferring from the community college to a given university in a specific major. Transfer agreements that are not student facing should not be posted in the same location as student-centered transfer maps.
4. To encourage the creation of high-quality transfer guides, transfer advisors at community colleges should strengthen relationships with advisors and staff at four-year colleges. Meet together; lunch together; do staff development training together (e.g., discuss/workshop pathways to transfer). These endeavors may also create an information chain that can be used when online information is updated or when questions from students arise.
5. To address advisor concerns that students do not use online information when it is available, transfer personnel should use multiple forms of social media to disseminate transfer advice, link to the transfer landing page, and post popular transfer maps.

Advisors should introduce students to the website and show them how to navigate it.

Implications for Future Research

Our recommendations for practice offer practical steps colleges can take to address those issues. Our results serve as a first step toward understanding the current state of online transfer information and how it may be measured. However, additional scholarship is necessary to examine whether and how students use online transfer information and their perceptions of transfer information. Building from our findings, future work should also examine how the ease

of access and the usefulness of online transfer information influence student outcomes, linking institutional measures to student-level data.

Conclusion

Community college education has the potential to improve labor market and life outcomes for a large swath of the population. To transfer from a community college to a four-year institution, students must make informed decisions, foreseeing a variety of potential educational pipelines. Students who want to avoid wasting time and money must enter the community college with a lot of information. Ideally, they would already know which major and destination university to pursue. In this context, even the savviest students—those who know precisely which program they hope to earn a degree in—may come up against barriers to transferring and to attaining a bachelor's degree if they face information constraints along the way. The cost of missteps is high: Students run the risk of spending their money and time on classes that will not contribute toward a degree. They often must follow specific recommendations in order to transfer to a desired four-year institution. A system in which that information is not posted publicly, is inadequately detailed, or is incoherently presented puts a great deal of burden on students and undermines a primary goal of postsecondary institutions: to improve the outcomes of their student body.

References

- Allen, J. M., Smith, C. L., & Muehleck, J. K. (2014). Pre- and post-transfer academic advising: What students say are the similarities and differences. *Journal of College Student Development, 55*(4), 353–367. doi:10.1353/csd.2014.0034
- Anderson, G., Sun, J. C., & Alfonso, M. (2006). Effectiveness of statewide articulation agreements on the probability of transfer: A preliminary policy analysis. *Review of Higher Education, 29*(3), 261–291. doi:10.1353/rhe.2006.0001
- Bahr, P. R. (2008). Cooling out in the community college: What is the effect of academic advising on students' chances of success? *Research in Higher Education, 49*(8), 704–732. doi:10.1007/s11162-008-9100-0
- Bailey, T. R., Jaggars, S. S., & Jenkins, D. (2015). *Redesigning America's community colleges: A clearer path to student success*. Cambridge, MA: Harvard University Press.
doi:10.4159/9780674425934
- Bailey, T. R., Jenkins, D., Fink, J., Cullinane, J., & Schudde, L. (2016). *Policy levers to strengthen community college transfer student success in Texas: Report to the Greater Texas Foundation*. New York, NY: Columbia University, Teachers College, Community College Research Center.
- Berdahl, R. O. (1971). *Statewide coordination of higher education*. Washington, DC: American Council on Education.
- Berdahl, R. O. (1999). Universities and governments in the 21st century: The US experience. In D. Braun & F.-X. Merrien (Eds.), *Towards a new model of governance for universities? A comparative view* (Vol. 53, pp. 59–77). Philadelphia, PA: J. Kingsley.

- Center for Community College Student Engagement. (2018). *Show me the way: The power of advising in community colleges* (2018 National Report). Austin, TX: Author.
- Crisp, G., & Nuñez, A.-M. (2014). Understanding the racial transfer gap: Modeling underrepresented minority and nonminority students' pathways from two- to four-year institutions. *Review of Higher Education*, 37(3), 291–320. doi:10.1353/rhe.2014.0017
- Davies, T. G., & Dickmann, E. M. (1998). Student voices in the transfer process: Do we hear them? Do we listen? *Community College Journal of Research and Practice*, 22(5), 541–557. doi:10.1080/1066892980220507
- Dougherty, K., & Kienzl, G. (2006). It's not enough to get through the open door: Inequalities by social background in transfer from community colleges to four-year colleges. *Teachers College Record*, 108(2), 452–487. doi:10.1111/j.1467-9620.2006.00658.x
- Fink, J., & Jenkins, D. (2017). Takes two to tango: Essential practices of highly effective transfer partnerships. *Community College Review*, 45(4), 294–310. doi:10.1177/0091552117724512
- GAO. (2017). *Students need more information to help reduce challenges transferring credits* (GAO-17-574). Washington, DC: Author.
- Garcia-Lopez, E., Garcia-Cabot, A., Manresa-Yee, C., de-Marcos, L., & Pages-Arevalo, C. (2017). Validation of navigation guidelines for improving usability in the mobile web. *Computer Standards & Interfaces*, 52, 51–62. doi:10.1016/j.csi.2017.01.011
- Hagedorn, L. S. (2010). The pursuit of student success: The directions and challenges facing community colleges. In J. Smart (Ed.), *Higher education: Handbook of theory and research* (pp. 181–218). Dordrecht, NL: Springer.

- Herrera, A., & Jain, D. (2013). Building a transfer-receptive culture at four-year institutions. *New Directions for Higher Education*, 2013(162), 51–59. doi:10.1002/he.20056
- Hodara, M., Martinez-Wenzel, M., Stevens, D., & Mazzeo, C. (2017). Exploring credit mobility and major-specific pathways: A policy analysis and student perspective on community college to university transfer. *Community College Review*, 45(4), 331–349. doi:10.1177/0091552117724197
- Horn, L., & Skomsvold, P. (2011). *Web tables: Community college student outcomes, 1994–2009* (NCES 2012-253). Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics.
- Hossler, D., Shapiro, D., Dundar, A., Ziskin, M., Chen, J., Zerquera, D., & Torres, V. (2012). *Transfer & mobility: A national view of pre-degree student movement in postsecondary institutions* (Signature Report No. 2). Herndon, VA: National Student Clearinghouse Research Center.
- Jaggars, S. S., & Fletcher, J. (2014). *Redesigning the student intake and information provision processes at a large comprehensive community college* (CCRC Working Paper No. 72). New York, NY: Columbia University, Teachers College, Community College Research Center.
- Jain, D., Bernal, S., Lucero, I., Herrera, A., & Solorzano, D. (2016). Toward a critical race perspective of transfer: An exploration of a transfer receptive culture. *Community College Journal of Research and Practice*, 40(12), 1013–1024. doi:10.1080/10668926.2016.1213674

Jain, D., Herrera, A., Bernal, S., & Solorzano, D. (2011). Critical race theory and the transfer function: Introducing a transfer receptive culture. *Community College Journal of Research & Practice*, 35(3), 252–266. doi:10.1080/10668926.2011.526525

Jenkins, D., & Fink, J. (2016). *Tracking transfer: New measures of institutional and state effectiveness in helping community college students attain bachelor's degrees*. New York, NY: Community College Research Center, Aspen Institute, and the National Student Clearinghouse Research Center.

Khlaisang, J. (2017). Proposing a new pedagogy-based website design: A usability test with lifelong learners. *Education and Information Technologies*, 22(4), 1713–1735. doi:10.1007/s10639-016-9514-9

Margolin, J., Miller, S. R., & Rosenbaum, J. E. (2013). The community college website as virtual advisor: A usability study. *Community College Review*, 41(1), 44–62. doi:10.1177/0091552112471844

Maxwell, J. A. (2012). *Qualitative research design: An interactive approach* (Vol. 41). Thousand Oaks, CA: Sage.

Monaghan, D. B., & Attewell, P. (2015). The community college route to the bachelor's degree. *Educational Evaluation and Policy Analysis*, 37(1), 70–91.

doi:10.3102/0162373714521865

National Center for Education Statistics. (2014). *Profile of undergraduate students: 2011-12*.

Table 1.1. Retrieved from <https://nces.ed.gov/pubs2015/2015167.pdf>

Nodine, T., Jaeger, L., Venezia, A., & Bracco, K. R. (2012). *Connection by design: Students' perceptions of their community college experiences*. San Francisco, CA: WestEd and Public Agenda.

- Perna, L. W., & Finney, J. E. (2014). The attainment agenda: State policy leadership in higher education. *Review of Higher Education*, 39(1), 170–172. doi:10.1353/rhe.2015.0047
- Person, A. E., Rosenbaum, J. E., & Deil-Amen, R. (2006). Student planning and information problems in different college structures. *Teachers College Record*, 108(3), 374–396. doi:10.1111/j.1467-9620.2006.00655.x
- Root, M. (2013). *Essential elements of state policy for college completion*. Atlanta, GA: Southern Regional Education Board.
- Rosenbaum, J. E., Deil-Amen, R., & Person, A. E. (2007). *After admission: From college access to college success*. New York, NY: Russell Sage Foundation.
- Schudde, L., & Goldrick-Rab, S. (2015). On second chances and stratification: How sociologists think about community colleges. *Community College Review*, 43(1), 27–45. doi:10.1177/0091552114553296
- Schudde, L., Jabbar, H., & Hartman, C. (2017). *Navigating the shapeless river: Institutional contexts and information-seeking behaviors of transfer-intending community college students*. Presented at the annual meeting of the Association for the Study of Higher Education, Houston, TX.
- Scott-Clayton, J. (2011). *The shapeless river: Does a lack of structure inhibit students' progress at community college?* (CCRC Working Paper No. 25). New York, NY: Columbia University, Teachers College, Community College Research Center.
- Scott-Clayton, J. (2012). *Information constraints and financial aid policy* (NBER Working Paper No. 17811). Cambridge, MA: National Bureau of Economic Research.
- Şengel, E. (2013). Usability level of a university web site. *Procedia-Social and Behavioral Sciences*, 106, 3246–3252. doi:10.1016/j.sbspro.2013.12.373

- Senie, K. C. (2016). Implementing transfer and articulation: A case study of community colleges and state universities. *Community College Journal of Research and Practice*, 40(4), 269–216. doi:10.1080/10668926.2015.1038667
- Shapiro, D., Dundar, A., Huie, F., Wakhungu, P.K., Yuan, X., Nathan, A. & Hwang, Y. (2017, September). *Tracking transfer: Measures of effectiveness in helping community college students to complete bachelor's degrees* (Signature Report No. 13). Herndon, VA: National Student Clearinghouse Research Center.
- Taylor, J. L., & Jain, D. (2017). The multiple dimensions of transfer: Examining the transfer function in American higher education. *Community College Review*, 45(4), 273–293. doi:10.1177/0091552117725177
- THECB. (2014). *Improving transfer to increase student success*. Austin, TX: Author.
- THECB. (2017). *Online institutional resumes*. Retrieved from <http://www.thecb.state.tx.us/apps/resumes/>
- Townsend, B. K., & Wilson, K. (2006). “A hand hold for a little bit”: Factors facilitating the success of community college transfer students to a large research university. *Journal of College Student Development*, 47(4), 439–456. doi:10.1353/csd.2006.0052
- Van Noy, M., Trimble, M., 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. doi:10.1177/0091552116652939

Table 1

Description of Colleges in the Sample (continued)

| College Characteristics | College | | | | | | | | | |
|---|---------------|-----------------|---------------|---------------|---------------|------------------|--------------------|------------------|------------------|-----------------|
| | K | L | M | N | O | P | Q | R | S | T |
| <i>Campus</i> | | | | | | | | | | |
| Setting | Large City | Town Distant | Small City | Large City | Large City | Town- Distant | Suburb- Midsize | Rural- Fringe | Town- Distant | Midsize City |
| 4-year colleges within 50 miles | 2 | 1 | 8 | 7 | 7 | 3 | 7 | 2 | 2 | 7 |
| <i>Student Characteristics</i> | | | | | | | | | | |
| Undergraduates (in 1000s) | 30-40 | <10 | >40 | 10-20 | >40 | 10-20 | 20-30 | <10 | <10 | <10 |
| Part-time | 0.78 | 0.78 | 0.74 | 0.70 | 0.70 | 0.48 | 0.67 | 0.62 | 0.68 | 0.73 |
| Female | 0.55 | 0.60 | 0.59 | 0.53 | 0.58 | 0.51 | 0.55 | 0.62 | 0.56 | 0.52 |
| Age 25+ | 0.37 | 0.17 | 0.29 | 0.33 | 0.34 | 0.9 | 0.27 | 0.59 | 0.25 | 0.36 |
| In-state | 0.93 | 0.97 | 1.00 | 0.99 | 0.96 | 0.96 | 0.99 | 0.34 | 0.99 | 0.99 |
| Distance Learners | 0.24 | 0.38 | 0.31 | 0.32 | 0.20 | 0.20 | 0.26 | 0.97 | 0.36 | 0.33 |
| Students of Color | 0.66 | 0.54 | 0.68 | 0.77 | 0.66 | 0.38 | 0.49 | 0.40 | 0.39 | 0.80 |
| Pell Recipients | 0.23 | 0.27 | 0.33 | 0.29 | 0.37 | 0.24 | 0.21 | 0.42 | 0.19 | 0.28 |
| <i>Credentials and Course Completion</i> | | | | | | | | | | |
| Associate Degree | 3,070 | 340 | 6,310 | 2,010 | 5,740 | 1,060 | 2,550 | 620 | 810 | 1,140 |
| Core Completer | 2,350 | 260 | 1,140 | 1,570 | 1,030 | 310 | 2,640 | 90 | 680 | 650 |
| <i>Transfer Outcomes</i> | | | | | | | | | | |
| Low transfer-out | | | | | | | | | | |
| High transfer-out, low BA rate | | | | | | | | | | |
| High transfer-out, modest BA rate | X | X | X | X | X | | | | | |
| High transfer-out, high BA rate | | | | | | X | X | X | X | X |

Note. See Appendix, Table A1, for sources.

Table 2

*Measuring Ease of Access and Usefulness of Online Transfer Information on Community**College Websites*

| Score | Ease of Access | Usefulness |
|-------|--|---|
| 1 | None: Seemingly no information provided, or none specific to the college | No information regarding transfer |
| 2 | Low: The information was not intuitively located, required many click-throughs and backtracking and/or using search tool and various search terms to locate | Low: Information present, but full of broken links, written in overly complex language (too wordy or provided in non-student-centered manner, like articulation agreements meant for administrators), and/or very disorganized, which made it difficult to find adequate and accurate information |
| 3 | Somewhat accessible: The information was far removed from the home page, due to nonintuitive labels on homepage; transfer page could be found by clicking through many links and backtracking to find right pathway | Somewhat useful: Transfer information includes some of necessary info to navigate transfer, but may not be complete (e.g., describes partnerships, but not services/processes to navigate transfer at the current college); the minimal information appears to be accurate, but very disorganized (requires going through disorganized system from transfer landing page to identify information by backtracking and navigating minimal broken links) |
| 4 | Moderate: Minimal click-throughs to reach transfer landing page, but vague label from homepage required some backtracking to locate | Moderate: Policies or processes necessary to guide student through transfer were present, but could be more detailed; flow of information moves from simple to complex, but required some backtracking to help students determine transfer process and requirements |
| 5 | High: Necessary information easily located on the first visit; minimal “clicks” from college homepage and/or intuitively labeled options to identify pathway to transfer information; no need to use search bar; no backtracking | High: Simple language used to define transfer process; succinct initial presentation followed by cohesive flow of additional details as user clicks through links to get more information; transfer options (institutional partnerships, articulation agreements) clearly presented; zero to few broken links; provided info on transfer services/processes or clearly linked to through university partners (links must go directly to transfer page of university, not home page) |

Table 3

Assessment of Ease of Access: Website Information by College

| College | Intuitive labels | Use search bar | Number of clicks | Backtracked | Notes | Ease of Access Rating |
|---------|------------------|----------------|------------------|-------------|--|-----------------------|
| A | N | Y ^a | 3 | N | No college specific information, transfer guides, or partner universities; search for transfer eventually leads to link to external website transfer101.org's home page | None |
| B | N | Y | 2 | N | No identifiable link to transfer from home page; typed "transfer" into search bar to find sparse transfer page | Moderate |
| C | N | N | 5 | Y | Had different transfer info links on various areas of home page, but several were broken or led to another broken link; eventually located info for system-level transition center through functioning link to system website, not any of the direct home page links | Moderate |
| D | Y | N | 3 | N | Selected "Career & transfer services," "Transfer assistance," then "Articulation agreements" | High |
| E | Y | N | 2 | N | Clicked "Current students", then "Transfer services" | High |
| F | N | Y | 2 | N | No identifiable link to transfer from home page, typed "transfer" into search bar, then tried several search returns before identifying student success link to follow to info on transfer center | Low |
| G | N | Y | 4 | N | Search for transfer yielded career services (not intuitively labeled), which provided some transfer info once clicking through links | Somewhat |
| H | Y | N | 1 | N | Had direct link labeled "transfer" on home page | High |

(Table 3 cont.)

| College | Intuitive labels | Use search bar | Number of clicks | Backtracked | Notes | Ease of Access Rating |
|---------|------------------|----------------|------------------|-------------|--|-----------------------|
| I | N | N | 2 | N | Click from home page to “university partnerships”; may not be most intuitive path for students: not entirely clear it will cover transfer and never uses that word | Moderate |
| J | Y | N | 3 | N | Following path to click through “Students” to “articulation agreements” to list of partner universities | High |
| K | Y | N | 3 | N | Selected “Degree and certificate” on home page (after hover indicated it included transfer options) and then selected “Transfer information” | High |
| L | Y | N | 3 | N | Selected “Students,” then “Graduation and Transfer” then “University partnerships” | High |
| M | Y | N | 4 | N | Various pathways to transfer info from home page: hovering over “Core Curriculum,” which stated it will transfer and to click to read more; clicking “student services” leads to link for “Transfer and Transcripts” then subsequent links from there | High |
| N | Y | N | 6 | Y | Took many clicks and backtracking to find transfer services page; several links while clicking through were broken, so required backtracking; eventually located in “Resources for” tab in system (not campus) homepage | Low |
| O | N | N | 3 | N | Clicked “Services” drop-down menu, then scrolled down to select “Transfer resources,” then only option was “Transfer to [College O],” which is not an intuitive location for transfer info to transfer to a university, but only 3 clicks from home page | Moderate |
| P | Y | N | 2 | N | Selected “Current students,” then “Transfer information,” to find contact and university partners, but missing links to some partners | Moderate |

(Table 3 cont.)

| College | Intuitive labels | Use search bar | Number of clicks | Backtracked | Notes | Ease of Access Rating |
|---------|------------------|----------------|------------------|-------------|---|-----------------------|
| Q | Y | N | 2 | N | Selected “Academics” and then option for “Transfer U” | High |
| R | N | N | 3 | N | Selected “Current students,” then “Advising,” then “Transfer guides,” but the final label was misleading (did not lead to transfer guides, but rather to external website of the THECB) | Low |
| S | Y | N | 3 | N | Selected “Current students,” “Academic transfer,” then “Major academic programs” | High |
| T | Y | N | 2 | N | Selected “Current students,” then “Transferring to a university” | High |

^a Even with using college website search bar and Google, no transfer-specific page could be located through this college website.

Table 4

Assessment of Usefulness: Website Information by College

| College | <i>Information provided:</i> | | | | <i>Issues navigating/interpreting the information:</i> | | | Usefulness rating |
|---------|------------------------------|------------------------------------|-------------------|-----------------------------------|--|--------------|--|-------------------|
| | Transfer Center | Contact Info | # Public Partners | College transfer services/process | Ineffective organization | Broken links | Notes | |
| A | N | N | N | N | Y | Y | Information consisted only of broad transfer tips. No college-specific information, transfer guides, or articulation agreements | No information |
| B | N | Individual - not transfer-specific | 10 | N | Y | N | Limited student-centered info on services/processes; content is somewhat disorganized; provided links to several partner university webpages, but some did not go to transfer landing page | Moderate |
| C | Y | Individual - transfer-specific | 8 | Y | N | Y | Provided thorough major-specific information; broken links for one department | High |
| D | Y | Office - transfer-specific | 10 | N | N | N | Provided pdf page with current articulation agreements (though no date, so hard to know if current); limited process-oriented content for students | Somewhat |
| E | Y | Individual - transfer-specific | 14 | Y | N | N | Information on college transfer services, 2+2 agreements; links to guides on university websites | High |
| F | Y | Individual - transfer-specific | 33 | Y | Y | N | Sparse specific info, though describes process of how to choose university; links to external webpages like college.gov | Low |

(Table 4 cont.)

| College | Transfer Center | <i>Information provided:</i> | | | <i>Issues navigating/interpreting the information:</i> | | | Usefulness rating |
|---------|-----------------|--------------------------------|-------------------|-----------------------------------|--|--------------|--|-------------------|
| | | Contact Info | # Public Partners | College transfer services/process | Ineffective organization | Broken links | Notes | |
| G | N | Office - not transfer-specific | 9 | Y | Y | Y | Several broken links within transfer page; lacked info about process/support; linked to counseling to get transfer services, but no information there | Low |
| H | N | Office - not transfer-specific | 21 | Y | N | Y | Very wordy content, but offered comprehensive, process-oriented info, including transfer-specific financial aid and advising info | High |
| I | N | None | 2 | N | N | Y | Offered links to university websites, but never explicitly mentions transfer, which may contribute to confusion | Low |
| J | Y | Office - transfer-specific | 15 | Y | N | N | Provided well-organized table with partner universities with functional links to their transfer landing pages; described transfer plans, policies, though could use more simple language | High |
| K | Y | Office - transfer-specific | 42 | Y | N | Y | Detailed, process-oriented info, incl. different resources on campus, transfer guides, and policy info for credit transfer; a few broken links to university partners | High |
| L | N | Office - not transfer-specific | 7 | Y | N | N | Offered info on partnerships, incl. definition of articulation agreements/MOU to make more student friendly | High |

(Table 4 cont.)

| College | Transfer Center | <i>Information provided:</i> | | | <i>Issues navigating/interpreting the information:</i> | | | Usefulness rating |
|---------|-----------------|------------------------------------|-------------------|-----------------------------------|--|--------------|--|-------------------|
| | | Contact Info | # Public Partners | College transfer services/process | Ineffective organization | Broken links | Notes | |
| M | Y | Individual - transfer-specific | 22 | Y | Y | Y | Disorganized (many click-throughs and backtracking necessary) with wordy content; relies on university partners to provide transfer guides; provides some process info, but in complex policy language (not student centered) | Somewhat |
| N | Y | Individual - transfer-specific | 6 | Y | N | Y | Well organized and detailed, but out of date: document with transfer process recommendations notes valid until fall 2012; some misinformation, incl. credits transfer info, perhaps due to lack of update; some broken links to partnerships | Somewhat |
| O | Y | Individual - transfer-specific | 18 | Y | N | N | Identified partner universities and linked to their transfer guides; provides simple language defining transfer process | High |
| P | N | Individual - not transfer-specific | 32 | Y | N | Y | Detailed info on process, but wordy and voluminous; offered course specific transfer guides, but missing links for some partner universities | Moderate |
| Q | Y | Individual - transfer-specific | 19 | Y | N | N | Information is plentiful and digestible, but lacking in visual presentation, so students must navigate a lot of text | High |

(Table 4 cont.)

| College | Transfer Center | <i>Information provided:</i> | | | <i>Issues navigating/interpreting the information:</i> | | | Usefulness rating |
|---------|-----------------|--------------------------------|-------------------|-----------------------------------|--|--------------|--|-------------------|
| | | Contact Info | # Public Partners | College transfer services/process | Ineffective organization | Broken links | Notes | |
| R | N | None | 11 | N | N | N | Provided link to TCCNS equivalency matrix, but no transfer guides (despite the “transfer guide” label of the page) and any info on services/process | Low |
| S | N | Office - not transfer-specific | 8 | N | N | N | Transferable course information organized by major; no process-oriented info, but encouraged students to meet with counselor or visit transfer101.org’s external page | Moderate |
| T | N | Office - not transfer-specific | 26 | Y | N | N | Provided simple language defining transfer policies (state core, transfer agreements, guides) and explaining transfer process; links to partner universities for transfer guides | High |

Appendix: Sources of Institutional Information

Table A1

Institutional Measures and Data Sources for Table 1

| Measure | Source | Description |
|---------------------------------------|-----------------|--|
| <i>Campus Context</i> | | |
| Campus setting | NCES (2017) | A measure of the urbanicity of the college setting, based on census definitions |
| 4-year colleges within 50 miles | NCES (2017) | Measure of the number of four-year colleges within 50-mile radius of the college |
| <i>Student Characteristics</i> | | |
| Undergraduates | THECB (2017) | Categorical measure of total undergraduate enrollment in fall 2015 |
| Part-time | NCES (2017) | Proportion of students enrolled for less than 12 semester credit hours per term |
| Female | NCES (2017) | Proportion of students who identify as female |
| Age 25+ | NCES (2017) | Proportion of students over the age of 25 at enrollment |
| In-state | NCES (2017) | Proportion of first-time degree/certificate-seeking undergraduates who qualify as state residents |
| Distance learners | NCES (2017) | Proportion of undergraduates enrolled at least partially in distance education as of fall 2015 |
| Students of color | THECB (2017) | Proportion of students who identify as Hispanic, African American, Asian/Pacific Isl., or “other” (non-White) racial backgrounds |
| Pell recipients | THECB (2017) | Proportion of students who received a federal Pell grant in fall 2015 |

(Table A1 cont.)

| Measure | Source | Description |
|---|-----------------|--|
| <i>Credentials and Course Completion</i> | | |
| Associate degree | THECB (2017) | Number of associate degrees awarded in 2016, rounded to the nearest 10 to maintain anonymity of colleges |
| Core completer | THECB (2017) | Number of students awarded core complete recognition in 2016, rounded to the nearest 10 |
| <i>Transfer Outcomes</i> | | |
| Low transfer-out rate | NSC (2014) | Dichotomous measure indicating that percentage of students who transferred to a four-year institution from this college was among the lowest in the state. Based on fall 2007 entry cohort data obtained from the National Student Clearinghouse, which was narrowed to enrollees at Texas community colleges. |
| High transfer-out, low BA rate | NSC (2014) | Dichotomous measure indicating that college was in the top half of the colleges in the state in terms of transfer-out rate (percentage of students who transferred to a four-year institution was above average), but, among those colleges, had the lowest percent of students who earned a bachelor's degree within six years of initial college entry. Obtained from fall 2007 entry cohort data obtained from the National Student Clearinghouse, which was narrowed to enrollees at Texas community colleges. |
| High transfer-out, modest BA rate | NSC (2014) | Dichotomous measure indicating that college was in the top half of the colleges in the state in terms of transfer-out rate (percent of students who transferred to a four-year institution was above average), but, among those, the college had a middling bachelor's-attainment rate. Obtained from fall 2007 entry cohort data obtained from the National Student Clearinghouse, which was narrowed to enrollees at Texas community colleges. |
| High transfer-out, high BA rate | NSC (2014) | Dichotomous measure indicating that college was in the top half of the colleges in the state in terms of transfer-out rate (percent of students who transferred to a four-year institution was above average) and, among those, the college demonstrated the highest percent of students who earned a bachelor's degree within six years of initial college entry. |