

FACTORS INFLUENCING ADMINISTRATIVE USER SATISFACTION WITH STUDENT INFORMATION
SYSTEMS IN COMMUNITY COLLEGES

by

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ABSTRACT

The literature is replete with ERP satisfaction studies in general but contains few focusing on higher education and fewer still on community colleges. This study examined factors influencing the satisfaction of community college administrative users with their institutions' student information systems (SISs) and was conducted to help provide insight to administrators and to suppliers. The satisfaction measure used was based on the Pearson & Bailey (1980) satisfaction and the Davis (1983) technology acceptance models as well as refinements from Doll & Torkzadeh (1988).

Data were collected via a questionnaire distributed to community college employees and subsequently shared by recipients with other potential respondents, forming a convenience sample. The 63 responses received represented employees in different demographic, employment, and functional area groups as well as institution sizes and rural, suburban, or rural classification.

No relationship was shown between employment, institutional, or demographic characteristics and SIS satisfaction. User-perceived self-efficacy was found to have a moderate positive correlation ($r = 0.61$) with SIS satisfaction. Results suggest that prior use of a different SIS correlate with lower satisfaction and that employees working in the registrar and administrative services are more satisfied. Respondents whose institutions were considering an SIS replacement reported lower satisfaction. The primary recommendations for practice based on the results are to dedicate resources to training on the SIS and to examine internal problem

reports for pain points and work to mitigate them. Taking these steps will facilitate increased self-efficacy and therefore increased SIS satisfaction.

Keywords: ERP, student information systems, community colleges, satisfaction

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CHAPTER ONE: INTRODUCTION

INTRODUCTION

A Student Information System (SIS) is the institutional system of record reflecting, at a minimum, completed and in-progress student work, course offerings, and their schedules. In addition, it is the system through which students are enrolled in courses and which catalogs and enforces prerequisites and other enrollment requirements. It is connected to and shares data with “many different systems, processes, and tools throughout the institution” (Lang & Pirani, 2016, p. 3). An SIS may also, but does not necessarily, provide self-service functions to students in addition to its administrative functions.

A plethora of research exists regarding student satisfaction with information systems. Examples include the periodic Ruffalo Noel Levitz studies on E-Expectations (Ruffalo Noel Levitz et al., 2017) and student satisfaction (Bryant, 2006). However, studies on satisfaction of college employees—particularly in the community college—are rare. The IMS Global Learning Consortium (IMS GLC) used to conduct a satisfaction survey on learning technology products, including SISs, but their most recent survey was conducted in 2010 (IMS Global Learning Consortium, 2008) and neither the survey instrument nor detailed results are made available to non-members. Studies by Davis (2007) and Suhy (2010) examined satisfaction with higher education enterprise resource planning (ERP) systems and information technology in general, respectively, but both those studies focused on four-year universities, which differ substantially

in mission and administration from community colleges (Cohen et al., 2014) and therefore merit separate examination.

IMPORTANCE

While the work of the community college is ultimately to benefit students, student satisfaction is dependent on the quality of the faculty and staff work environment, and the SIS forms a large part of that infrastructure. Additionally, an SIS can impose or remove roadblocks to administrative tasks that directly affect students. For example, an SIS that makes scheduling course sections cumbersome will cause more time to be required to build a schedule, making students wait longer to consider enrollment opportunities. An SIS that provides an easier-to-manage taxonomy of academic structure helps institutions more easily make new programs available and facilitates responsiveness to the needs of employers and transfer partners.

The SIS is the system of record for the core services that form the *sine qua non* of any higher education institution including maintenance of the course catalog and schedule of classes, registration of students, collection and maintenance of grades, production of transcripts, disbursement of financial aid, and production of government reports. All staff and faculty members, to varying degrees, directly interact with or are affected by the SIS.

Thus, this work seeks to determine the degree of satisfaction with student information systems (SIS) among administrative users in community colleges and to what extent their employment characteristics (e.g., organizational level, length of service), demographic factors, perceptions of self-efficacy with use of the SIS, and the use of a previous SIS influence the positive or negative perception of the SIS as expressed in various parameters. One set of

parameters adapted for this study was given by (DeLone & McLean, 2003) in their Information Systems Success Model.

According to data provided by Lang and Pirani in an EDUCAUSE report (2016), SISs are the longest-serving of administrative systems on college campuses, with a mean age of thirteen years. They attribute this longevity not only to the technical complexity of SISs but also to the broad involvement in the SIS across an institution. The extension of tendrils of the SIS throughout the nervous system of an institution make its replacement an arduous undertaking and one fraught with peril. Cramer, when writing about implementing a new SIS, suggested imagining “putting Sartre’s *No Exit* together with *Apollo 13*, then add [sic] in *Groundhog Day*” (2005, p. 43) when illustrating the demands a registrar could expect to face.

Also, while SIS offerings from each supplier are generally similar across institutions, community colleges have some needs that are not often met by off-the-shelf packages and make significant additional investments to customize or add to the delivered software. Some of these needs resulting in alterations include the administration of clock hour programs, implementation of Guided Pathways, and monitoring of coursework for financial aid recipients to ensure same is required for their program of study. Barbatis, writing about use of student affairs IT in *New Directions on Community Colleges*, pointed out these trends as an indicator of a need for institutions to leverage their technology to “create a positive experience for students and provide support service staff with the requisite tools to enhance job performance and effectiveness” (2014, p. 60).

According to Barbatis, colleges “beginning to become more prescriptive in their programs of study and mandate certain expectations to include the sequence of courses [and]

the number of credit hours a student takes” (2014, p. 60), helping to illustrate the demands being placed on student information systems by just one common institutional initiative. Barbatis contrasted these contemporary requirements with college information systems that were often retooled to prepare for the year 2000, at which point “the primary concern was to ensure records could be safely accessed in the new millennium” (2014, p. 59). This reason was also brought out by other authors, including Norris et al. (2008), Davis (2007), and Scholtz et al. (2013).

Information Security

Community colleges, like other sectors of higher education, have recently increased emphasis on the protection of data. Colleges have long considered student privacy in their operations, owing in part to the Federal Education Rights and Privacy Act (FERPA), which was passed in 1965. FERPA has since been joined by other legislative and regulatory requirements around data privacy and security, including the Privacy Act of 1974, the Health Insurance Portability and Accountability Act (HIPAA), and the Federal Trade Commission’s Red Flag Rules. For colleges operating in the European Union or the European Economic Area, the EU General Data Protection Regulation (GDPR) also applies.

In addition to these laws and regulations, the U.S. Department of Education (ED) recently began to publishing guidance holding higher education institutions who process Title IV financial aid to data safeguarding regulations intended for banks and brokerages, reasoning that colleges who process federal student loans are financial institutions under the Gramm-Leach-Bliley Act (GLBA). ED has also required that institutions report actual or suspected data breaches directly to the Department and added compliance with financial institution security

regulations to annual audit requirements. It is unsurprising, then, that in the most recent list of top IT issues published by EDUCAUSE information security was the chief concern (Grajek, 2018).

Integration

Immediately following information security on the EDUCAUSE top IT concerns list is student success, stated as “managing the system implementations and integrations that support multiple student success initiatives” (Grajek, 2018, para. 5). The desire to integrate SIS information in the service of student success is evident from the numerous add-on products from various vendors which claim to contribute to student success. Analytics is the most heard of these, but their number also includes early alert, scheduling, iPASS (Integrated Planning and Advising for Student Success), and degree planning systems. All of these systems either rely on data from the SIS, integrate with it, or both.

Reporting Requirements

An additional matter of concern is the expansion of reporting requirements from institutions such as expanded, program-level enrollment reporting requirements to the U.S. Department of Education, unit record reporting to state-level databases, and increasingly granular reporting requirements to grant makers and other sponsors of campus initiatives.

This perfect storm of acceleration of regulatory and institutional expectation changes, along with demand for timely self-service analytics, engenders institutional desire to consider changing their SIS to one that can meet those challenges. At the same time, tight budgets coupled with vendor encouragement to adopt off-premises solutions in the form of promises of increased efficiency and function, or coercion to avoid increased support fees or complex on-

premises upgrades, or both, conspire to drive institutions to consider replacing or changing their SISs from on-premises to off-premises hosting. It is thus appropriate and important to learn what factors have contributed to the success and failure of existing systems. This is especially important to community colleges given the high cost and broad institutional disruption associated with changing student information systems: an SIS decision is a long-term commitment not entirely dissimilar to a marriage with consequences similar to same in the event of a change.

Technostress

Technology in the higher education workplace continues to become more pervasive, including the expanding mission of the SIS and users spend a greater proportion of time interacting with the SIS and systems which connect with it (e.g., early alert, student judicial, and scheduling systems). In some cases, this high rate of interaction with technology contributes to “perceived work overload, demoralized and frustrated users, information fatigue, loss of motivation, and dissatisfaction at work” (Ragu-Nathan et al., 2008, p. 418), a phenomenon referred to as *technostress* (Ragu-Nathan et al., 2008).

An important contributor to technostress given by Ragu-Nathan et al. (2008) is that applications like SISs can rarely be used without customization. They pointed out that making the customizations themselves is a “highly political and stressful process” (2008, p. 422) and that users may experience additional problems resulting from the local changes. These problems can contribute to frustration with the system and decreased job satisfaction. These can negatively influence institutional culture and distract faculty and staff from the mission.

Implementation Reasons

When considering SIS satisfaction, it is useful to consider some of the reasons they are implemented in the first place. Some of the major impetuses for SIS implementations in the last two decades included the desire to make student self-service functions available via the Internet, better integrate the SIS into other campus administrative systems (such as human resources and financial management), and even to avoid retrofitting their then-current systems for the year 2000. In the decades prior, it was not uncommon for institutions to develop their own SISs or to heavily customize one delivered from a vendor in source form. Starting around the late 1990s, major vendors including SCT (now Ellucian) and PeopleSoft (now part of Oracle) began offering integrated ERP (Enterprise Resource Planning) suites that not only included an SIS, but also offered highly integrated human resources, college advancement, financial, and other systems. That trend has accelerated to the point that today finds all major SIS vendors offering integrated, cross-functional solutions in which the SIS is one component system.

Today, SIS implementations are considered in part to take advantage of recent innovations and to replace systems implemented, in some cases, nearly two decades ago. As the cloud and other forms of hosting and outsourcing become more prevalent, SIS vendors have entered the market with solutions that are marketed to institutions on a subscription basis rather than licensed and run on-premises. The model portends a tradeoff for institutions who are considering it: cede control of the SIS to the vendor, including losing the ability to customize, in exchange for more rapid access to innovations and a predictable cost model.

Whether an institution implements an SIS to correct perceived deficiencies, to escape a burning technology platform, or to pursue a strategy of modernization or streamlining, its

administration must carefully consider, not only the experience of students, but that of the faculty and staff who use the system to serve them. Knowing what factors influence administrative user satisfaction and whether they can be influenced by the institution will allow community colleges to facilitate the most effective use possible of their existing SIS investments and to make more informed decisions about future SIS acquisitions.

STATEMENT OF THE PROBLEM

This work seeks to address the gap in the knowledge about the satisfaction of community college administrative users of SISs and the factors contributing thereto. It will measure the degree of satisfaction among those users and gather data as to what extent their employment characteristics (e.g., department or functional area, length of service), demographic factors, previous use of a different SIS, and other factors influence the positive or negative perception of the SIS as expressed in various parameters selected from those in the information systems literature. The study methodology was informed by the Technology Acceptance Model (F. D. Davis, 1985), the user satisfaction model (Pearson & Bailey, 1980), and subsequent frameworks developed both from and in parallel with those major works, such as the DeLone and McLean (2003) Information Systems Success Model and the composite model due to Wixom and Todd (2005).

Administrative users are categorized by organizational, demographic, and personal factors such as functional area of employment, age bracket, and length of tenure at the institution. SISs are categorized by the length of time the system has been in place, whether the SIS is part of a single vendor solution for multiple campus systems (i.e., the SIS is delivered with other campus systems such as those helping manage human resources, accounting, or fund

raising from the same vendor), and whether it is run on-premises or remotely. An additional category is whether the SIS is maintained by the college or whether that is done by the SIS vendor or a service provider.

RESEARCH QUESTIONS

The broad research questions are:

1. To what extent are employment and institutional characteristics correlated with SIS administrative user satisfaction?
2. To what extent are demographic factors correlated with SIS administrative user satisfaction?
3. To what extent are users' perceptions of self-efficacy in the SIS correlated to their satisfaction with it?
4. To what extent are users' prior engagements with one or more previous SISs correlated with their satisfaction with their current ones?
5. To what extent are administrative users' functional areas of operation correlated with their satisfaction with the SIS?
6. To what extent are characteristics of the SIS installation correlated with administrative user satisfaction?

DEFINITION OF TERMS

To facilitate discussion of these research questions, the following definitions are provided for potentially unclear or technical terminology.

- *Cloud*: "A model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g. networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction" (Mell & Grance, 2011, p. 2).
- *Enterprise Resource Planning (ERP)*: A system that is "multiple in scope, tracking a range of activities that include human resources (HR) systems, student information systems, and financial systems"; "integrated, meaning when data is added in one area, information in all areas and related functions also changes"; "modular in structure"; and "consisting of industry-specific solutions that enhance standard

systems by providing best practices for key business processes, and interpreted to include business process redesign” (Kvavik et al., 2002, pp. 18-19).

- *Information System (IS)*: A system that provides information for decision making and control of the organization (Agrawal & Gupta, 2011)
- *On-Premises*: Not using the cloud model and hosted on computing resources controlled by the institution; Hosting on-premises does not preclude access via the Internet.
- *Software as a Service (SaaS)*: A cloud computing model in which “the capability provided to the consumer is to use the provider’s applications running on a cloud infrastructure. The applications are accessible from various client devices, such as a web browser (e.g., web-based email), or a program interface. The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, storage, or even individual application capabilities, with the possible exception of limited user-specific application configuration settings” (Mell & Grance, 2011, p. 2).
- *Student Information System (SIS)*: “Software to manage information about students, including the admissions process, course registration and grades, degree audit, housing, etc., and to provide student self-service functions such as course registration, access to course catalogues, class schedules, grades, transcripts, and so forth” (EDUCAUSE, n.d., para. 209). It serves as the system of record for student-centric processes and is the authoritative source for related information presented to other campus systems (Lang & Pirani, 2016).

CHAPTER SUMMARY

This chapter has given a brief background on Student Information Systems both separately and as a component of ERP system and explained why community college leaders would be interested in the topic. It discussed some of the motivations for purchase, update, or change out of SISs in community colleges. Those motivations include security requirements, integration, and reporting needs, as well as employee and student satisfaction. It also touched on reasons for initial implementation of some systems in place today, particularly the Y2K issue, and provided definitions for terms that might be unfamiliar to professionals outside of IT.

CHAPTER TWO: LITERATURE REVIEW

INTRODUCTION

In order to meaningfully study factors that contribute to user satisfaction with SISs, it is of course necessary to arrive at a working definition of satisfaction itself that lends itself to measurement. Satisfaction is a deceptively simple concept that conceals a fair bit of complexity, and there is a rich and extensive body of literature related to user satisfaction with, and acceptance of, information systems in general. Those works include the foundational works of Pearson and Bailey (1980), Davis (1985), and Doll and Torkzadeh (1988), as well as later works including Mullany (2002) and Sethi and King (1998) that serve as examples of refinements and alternative methods of measuring and presenting user acceptance and satisfaction results. Mullany et al. (2006) later offered the *S statistic* that distilled user satisfaction (defined as the absence of dissatisfaction) to a single, overall figure.

While technology acceptance is not the same thing as user satisfaction, the Technology Acceptance Model (TAM) originated by Davis (1985) and validated and refined by Venkatesh and Davis (2000) share some theoretical underpinnings with work on user satisfaction. Both satisfaction and acceptance have been used as indicators of information systems success and have been integrated into single theoretical frameworks (Wixom & Todd, 2005) and are thus both worth consideration.

ASSESSING SATISFACTION

Overview

Evidence in scholarly interest in the measurement of satisfaction with information systems dates back to the 1970s including Nolan and Seward (1974) and Zmud (1979). One of the first comprehensive theoretical models of satisfaction was initially put forward (Pearson & Bailey, 1980) and further developed (Bailey & Pearson, 1983) several years later.

The satisfaction instruments represented in the literature were refined over time to incorporate more underpinnings from social science research on employee satisfaction. Goodhue (1988) showed the connections of the IS satisfaction theoretical models to social science literature of the day to have been tenuous and, as reported by Etezadi-Amoli and Farhoomand (1996), the literature did not connect measures of IS satisfaction to successful IS performance. Along the same lines, Melone (1990), responding to the prevailing logic that an effective IS necessarily implies satisfied users while dissatisfied users make IS effectiveness impossible, argued that “it is possible to have ‘an effective IS’ without satisfaction on the part of the users” (1990, p. 79) in an IT environment in which the system is mandated and users’ work is completely dependent upon the system.

As the satisfaction models have evolved over the last three decades, authors winnowed the number of characteristics measured. One early satisfaction model from Bailey and Pearson (1983) included thirty-nine separate factors. Wixom and Todd (2005) reported on four satisfaction models including Bailey and Pearson (1983), Ives et al. (1983), Baroudi and Orlikowski (1988), and Doll and Torkzadeh (1988) and showed that the number of factors decreased from thirty-nine in the Bailey and Pearson model to twelve in the Doll and Torkzadeh

model, as well as that the twelve factors can be traced back to Bailey and Pearson (1983). Moving in the other direction, Au et al. (2008) put forward a much more complex model that incorporated not only user opinion of performance and expectations thereof, but measures of fulfillment which attempt to incorporate “the psychological intricacies and the underlying reasons of why end users are satisfied or dissatisfied with an IS” (2008, p. 454) into the model.

Melone (1990), in her work arguing that IS satisfaction does not necessarily correlate with IS effectiveness, nonetheless acknowledged as strengths of the IS satisfaction models that they established sets of standards that enable comparison across different organizations and are “relatively simple and inexpensive to administer” (p. 76) to users.

Studies by Gatian (1989) and Gelderman (1998) reported results supporting a relationship between IS satisfaction and measured productivity associated with information system. The Gelderman study is of relative interest to others of IS satisfaction because it measures the relationship between satisfaction and productivity associated with a higher education administrative system and thus provides sector-specific support for such influence despite the fact that system studied in that work was a financial management system rather than an SIS.

Theoretical Underpinnings

Early research into information systems satisfaction was born out of a desire to find a standard way to measure of information systems success (DeLone & McLean, 1992; Ives et al., 1983). Ives posited that it would be ideal to directly measure benefits of a system on “its degree of use in decision making and the resultant productivity benefits” (1983, p. 785) but also acknowledged that such direct measurement is not practicable. Taking the place of direct

degree of use and productivity measures is the attempt to measure users' attitude towards a system in the belief that positive attitudes correlate with a higher degree of use and satisfaction (Goodhue, 1988; Pearson & Bailey, 1980), from which success is assumed to follow.

An early exploration of user satisfaction measures is due to Pearson and Bailey (1980), who arrived at a quantitative model that computed satisfaction for an individual as a single number based on factors of the systems under study. That number was the sum of the products of each importance weight and raw satisfaction score for each individual expressed as seen in Figure 1 where S_i is the satisfaction of individual i , $W_{i,j}$ is the importance weight of factor j for individual i , and $R_{i,j}$ is the raw score of factor j for individual i (Pearson & Bailey, 1980, p. 59).

Figure 1. Pearson and Bailey Satisfaction Equation

$$S_i = \sum_{j=1}^n W_{i,j} R_{i,j}$$

Source: Pearson and Bailey, 1980, p. 59

The initial factors that formed the Pearson and Bailey model were first posited by experts in the information systems field and then subjected to an “empirical test for completeness” (1980, p. 60) based on interviews with stakeholders. Thirty-nine factors were selected for the resulting model based on the probability of each one of having been considered important having exceeded 90% and constituted the factors from which user satisfaction would be calculated (Pearson & Bailey, 1980).

The weights for the factors were then determined using “semantic differential” (1980, p. 61) analysis wherein Likert-like scales were formed with opposite adjectives (e.g. good and bad)

on each end and adverbs (e.g. extremely, slightly, equally) corresponding to the numerical weights of a seven-point scale. Each factor was evaluated with several different sets of two adjectives at opposite ends of its respective scales; those results were used by Pearson and Bailey to measure the consistency of the respondents' ratings when developing the model. Lastly, measures of importance were collected on a seven point scale with *important* at one end and *unimportant* on the other and each point mapped to a numeric value forming a linear scale across the two ends (Pearson & Bailey, 1980).

In their evaluation of their self-assessments of the model, Pearson and Bailey observed that "a comparison of the weighted and unweighted satisfaction scores for this group of users revealed a very close correspondence" (1980, p. 64) and that "the use of a weighting function to alter the factor scores did little to increase the information conveyed by the less complex satisfaction score" (1980, p. 64).

Measures

The original Pearson and Bailey (1980) model identified thirty-nine factors in five major categories that indicated "what" to measure to indicate the state of an individual user's satisfaction (1980, p. 60). The categories included organization-wide attributes such as "top management involvement," information technology area characteristics (e.g. "attitude of the EDP staff," subjective system interaction evaluations like "convenience of access," quality perceptions (e.g. "accuracy," "timeliness"), and end-user attributes such as "confidence in systems" and "feeling of participation" (Pearson & Bailey, 1980, p. 60).

Later instruments reduced the number of characteristics that descended from Bailey and Pearson (1983). Doll and Torkzadeh (1988), for example, removed items related to

subjectively evaluating information technology staff and the relationship therewith, arguing that those “items assume a more traditional computing environment and . . . are not application specific” (1988, p. 263). These reductions in the number of characteristics considered in the model have been both praised and criticized in subsequent literature.

ASSESSING ACCEPTANCE

Overview

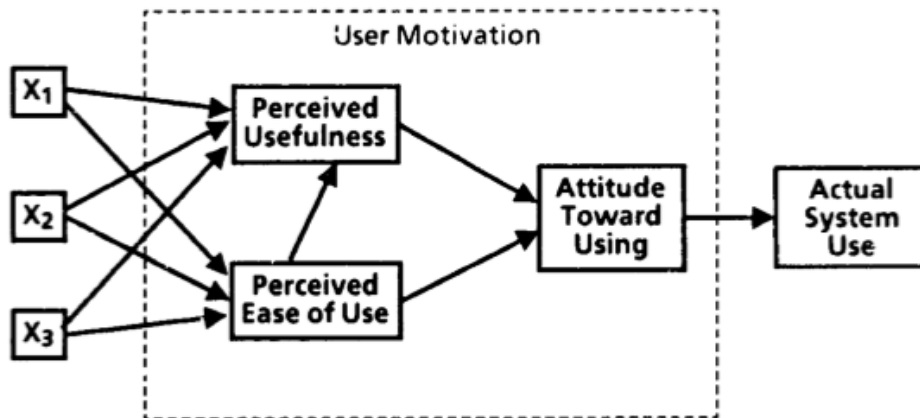
Similar to the satisfaction models, technology acceptance models evolved over time to further augment the information systems-specific domain with information from the social and behavioral sciences. The early model from Davis (1985), according to Amoako-Gyampah and Salam (2004), Wixom and Todd (2005), Benbasat and Barki (2007), and Suhy (2010), was informed by Ajzen and Fishbein’s theory of reasoned action. That theory states that behavior is a function of both an actor’s attitude towards the behavior and of the normative expectations of society with respect to same (Ajzen & Fishbein, 1970). However, the Davis (1985) model omits the social norms component of the theory of reasoned action from the acceptance model (F. D. Davis et al., 1989).

Theoretical Underpinnings

The intention of acceptance models is to predict use of an information system, rather than to measure perception of its quality. The model has two major inputs, *perceived usefulness* and *perceived ease of use* of each *design feature*. Perceived usefulness and perceived ease of use in tandem influence *attitude towards using*, which in the model

determines the propensity or lack thereof to use an information system (F. D. Davis, 1985), as illustrated in the following graphic of the model (see Figure 2).

Figure 2. Technology Acceptance Model Diagram



Source: F. D. Davis, 1985, p. 24

In the diagram, x_1 , x_2 , and x_3 correspond to design features, each of which contribute to perceptions of both usefulness and ease of use. The diagram also illustrates a theorized influence on the perception of ease of use on that of usefulness. Davis (1985) expressed the model in four equations (see Figure 3) where $x_1 \dots x_n$ correspond to the design features, EOU and USEF represent perceived ease of use and perceived usefulness respectively, and ATT represents attitude toward using. The β terms are “standardized partial regression coefficients” and ε is a “random error term” (F. D. Davis, 1985, p. 25).

Figure 3. Technology Acceptance Model Mathematical Model

$$EOU = \sum_{i=1}^n \beta_i x_i + \varepsilon$$
$$USEF = \sum_{i=1}^n \beta_i x_i + \beta_{n+1} EOU + \varepsilon$$
$$ATT = \beta_1 EOU + \beta_2 USEF + \varepsilon$$
$$USE = \beta_1 ATT + \varepsilon$$

Source: F. D. Davis, 1985, p. 24

According to Davis, “using multiple regression enables one to compare the relative influence of different beliefs in determining attitude toward using” (1985, p. 27). This is in contrast to the conclusion reached by Pearson and Bailey (1980) with respect to the satisfaction model. Recall that in the initial creation of the model, they used different weights for each component of satisfaction but concluded that the weights provided little information.

A number of authors worked to refine the acceptance model and a number of competing models entered the literature over the decades. Venkatesh et al. (2003) put forward a unified model, the *Unified Theory of Acceptance and Use of Technology (UTAUT)*, that combined aspects of eight different acceptance models, reducing the number of variables leaving “four core determinants of intention and usage, and up to four moderators of key relationships” (2003, p. 425) based on empirical comparisons of the eight models. This reduction of the model was mentioned by Straub and Burton-Jones (2007) who, in the process of criticizing the TAM and lamenting its dominance, called the UTAUT “deceptively parsimonious” (2007, p. 227), claiming that its simplified constructs obscure numerous variables.

Measures

Davis' (1985) original model included questions generated from thirty-seven previous studies for ease of use and yielded seven significant items: "effectiveness, job performance, quality of work, increased productivity, accomplish more work, work more quickly, and overall usefulness" (1985, p. 90). Resultant measures of usefulness were "controllable, cumbersome, rigid & inflexible, frustrating, understandable, mental effort, overall ease of use, ease of learning, and effort to become skillful" (1985, p. 90).

A UNIFIED MODEL

Relationship of Satisfaction and Acceptance

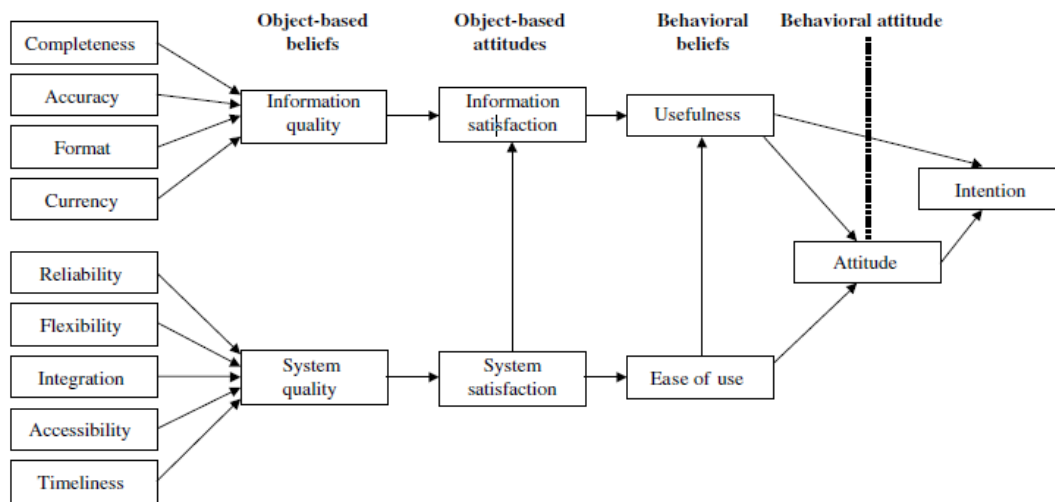
Wixom and Todd (2005) examined both the user satisfaction and technology acceptance models and synthesized those into a framework that combined components from both into a single model, treating user satisfaction as an "object-based attitude" (2005, p. 90) component of a new, combined model. That treatment of satisfaction is consistent with the information systems success work of DeLone and Mclean (1992) that considered six categories—two of which were use—which, in the TAM, directly depends upon acceptance (F. D. Davis, 1985) and user satisfaction.

Measures

The resultant measures from Wixom and Todd (2005) include "completeness, accuracy, format, and currency" (2005, p. 90) that, in the model, form a measure of belief in information quality along with "reliability, flexibility, integration, accessibility, and timeliness" (2005, p. 90), which form the model's measure of system quality. Information quality and system quality in

turn are considered to influence satisfaction attitudes, which influence beliefs in usefulness and ease of use (Wixom & Todd, 2005). An illustration of the integrated model and those relationships follows (see Figure 4).

Figure 4. Wixom and Todd Integrated Satisfaction and Acceptance Model



Source: Wixom and Todd, 2005, p. 90

USE IN HIGHER EDUCATION

Satisfaction and Acceptance in Higher Education

While there is a dearth of literature using the satisfaction and acceptance models in community colleges specifically, there has been sufficient validation of both models, individually and as components in hybrid models, in higher education in general. One example is the study by Kositanurit et al., which used elements of both the acceptance and satisfaction models to study system success in a variety of industries and received 168 of its 349 responses—nearly half—from higher education and research institutions (Kositanurit et al., 2006). Suhy (2010) applied and augmented the acceptance model in a study of organizational factors affecting faculty satisfaction with information technology.

Abugabah et al. (2013) applied the perceived usefulness and perceived ease of use elements of the TAM along with satisfaction and success model components specifically to higher education ERP in six Australia universities in a study that had 387 respondents. Olugbura et al. (2014) used the TAM to help identify critical success factors in higher education institutions in South Africa. Igbaria and Tan (1997) integrated TAM along with aspects of user satisfaction in a study to determine the influence of technology acceptance on individual employees' performance.

PRECURSORS OF SATISFACTION

There are any number of potential antecedents of satisfaction with and acceptance of student information systems. The work of Suhy (2010) supports inclusion of individual and organizational characteristics as additional inputs in a theoretical model of faculty user satisfaction with information technology. Selected characteristics from that study included enrollment, "degree of urbanization" (Suhy, 2010, pp. 59–60), information on faculty job status (e.g. tenure, union membership), academic discipline (e.g. Medieval Studies), and demographics (e.g. age, race, gender) along with questions speaking to satisfaction with the institution itself (Suhy, 2010).

Haab (2007) connected modes of user participation in university ERP implementations to satisfaction based on an instrument based on the Doll and Torkzadeh (1988). In her work, she showed evidence suggestive of a causal link from role and modes of participation to satisfaction (Haab, 2007).

Characteristics of institutions and users themselves that are potentially demonstrable as precursors of satisfaction include:

- Academic department (though emphasis is on administrative users) /functional area
- Staff classification (e.g., hourly, salaried, tenured, adjunct)
- Frequency of use
- Institution size
- Institution organization (multi-campus district vs. single)
- Geographic location
- Position level
- Involvement in implementation
- Prior use of a different system
- Length of time system has been in place
- Length of time in position
- Computer comfort/self-efficacy
- Training/lack thereof

CHAPTER SUMMARY

In this chapter, the literature of information systems satisfaction and acceptance were reviewed, along with models that unified the two. Examples of application of the models in higher education were provided and possible precursors of satisfaction, acceptance, and success were provided. The posited precursors inform the methodology for determining satisfaction itself in the study and subsequent analysis in which correlations between factors other than acceptance and satisfaction themselves influence same.

CHAPTER THREE: METHODOLOGY

INTRODUCTION

This chapter will explain the methodology used to gather and analyze satisfaction and potential precursor information from SIS users, including considerations of appropriateness and discussion of the study's sampling method and population selection criteria.

The research used quantitative elements to examine the link between SIS satisfaction and the factors using statistical methods. A correlational design fits these research questions well. An experimental design was not given that installing SIS with different characteristics in a multitude of institutions and measuring satisfaction would have been impossible. A fully descriptive design would not have gathered sufficient data or data in a format that, even after coding, would serve well as independent variables to correlate with satisfaction.

The quantitative methodology is founded on the extant IS satisfaction literature and tuned to the particular research questions related to SIS satisfaction that follow. From that foundation, the researcher constructed a questionnaire to collect measures of IS satisfaction along with the factors believed to influence satisfaction. The questionnaire gathers the IS satisfaction metric in two ways, allowing for not only the measurement of satisfaction against each of the proposed factors but also the possibility of cross-validation of the measures of satisfaction themselves.

RESEARCH QUESTIONS

The research questions are:

1. To what extent are employment and institutional characteristics correlated with SIS administrative user satisfaction?
2. To what extent are demographic factors correlated with SIS administrative user satisfaction?
3. To what extent are users' perceptions of self-efficacy in the SIS correlated to their satisfaction with it?
4. To what extent are users' prior engagements with one or more previous SISs correlated with their satisfaction with their current ones?
5. To what extent are administrative users' functional areas of operation correlated with their satisfaction with the SIS?
6. To what extent are characteristics of the SIS installation correlated with administrative user satisfaction?

RESEARCH METHODS

The dependent variable in all the research questions is, ultimately, satisfaction with the respondents' student information systems. Two different measures of satisfaction are available from the data, so it is possible to compare and contrast each of them with respect to the independent variables, as well as to consider the degree of correlation between the satisfaction measures themselves. This variable will be able to be represented at the interval level.

The independent variables, broadly stated in the research questions, are employment and institutional characteristics, demographic factors, perception of self-efficacy with the SIS, prior engagement with other student information systems, functional areas of employment, and SIS installation characteristics.

Employment characteristics include a respondent's full- or part-time status, hourly or salary status, length of time in higher education work, and whether the respondent has

professional experience working outside of higher education. All of the employment characteristics are measured at the ordinal level except for whether the candidate has worked outside of higher education, which was nominal. Institutional characteristics included the number of students served by the institution, whether the institution serves a rural, suburban, or urban area, and whether the institution operates alone or is part of a multi-campus district. All of these data are at the nominal level, except for the number of students served, which was collected at the ordinal level.

Demographic factors include the gender identity, age, race/ethnicity, and education level of the respondent. Gender and race/ethnicity were nominal variables, while educational level and age were ordinal, based on highest degree held and age range, respectively.

Perception of self-efficacy is a measurement of to what degree the employee feels comfortable, competent, and effective using their institution's SIS. The self-efficacy measure was ordinal.

Prior engagement with SIS is a yes/no variable that indicates whether the respondent has worked in a professional capacity with one or more SIS other than the one at their current institution. Functional area of operation is a nominal variable that captures the major unit in which the respondent works, such as the Registrar's Office. Recognizing the possibility that a respondent can work in more than one area or in a shared service pool such as a one-stop operation that supports multiple areas, in those cases, the respondents were asked to pick the area with which they feel most aligned. Both of these variables provided nominal data.

SIS installation characteristics included the length of time the system has been in place, whether the SIS is part of a single-vendor solution for other campus system (i.e., part of an ERP

system), whether the SIS is run on-premises or remotely, and whether the college or a vendor or service provider maintain (such as Software as a Service or cloud) the SIS. All of these variables are nominal, except for length of time the system has been in place, which was ordinal.

For size of institution, the Carnegie size classifications based on full-time equivalent (number of full-time students plus the number of part-time students divided by three) enrollment (*About Carnegie Classification*, n.d.) for two-year colleges were used.

To measure users' perceptions of their facility with the SIS, an instrument due to Hollenbeck and Brief (1987) was used. The instrument measures "perceptions of task specific ability" (1987, p. 400) and has been used and adapted as part of myriad studies in which self-efficacy was an independent variable in studies citing that research conducted over two decades, including older studies by Lincecum, (2000) and Abdillah (2009) as well as quite recent ones by Peechapol et al. (2018) and Gupta and Bostrum (2019). The self-efficacy portion of the questionnaire consists of five questions regarding subjects' confidence in their abilities and perceived efficacy with their ERP systems, asking the person taking the survey to rate their level of agreement with the five statements. The questionnaire in its original form was found by the earlier researchers to be a reliable measure, with Cronbach's $\alpha = 0.89$ (Hollenbeck & Brief, 1987). The statements as adapted for student information systems were:

1. I have mastered the use of my institution's student information system.
2. I do not perform as well in our institutions student information system as I would like.
3. I am certain I can use my institution's student information system well.

4. It is just not possible for me to use my institution's student information system at the level I would like.
5. I think my performance with my institution's student information system could be improved substantially.

An instrument to measure user satisfaction was created combining the entire Doll and Torkzadeh (1988) instrument and adding questions related to acceptance from Wixom and Todd (2005). This resulted in a combined model that incorporates refinements subsequent to those of Pearson and Bailey (1983) and DeLone and McLean (1992). Incorporating only questions related to acceptance from Wixom and Todd (2005) reduced the burden on respondents by avoiding asking similar questions repeatedly.

Classification questions were asked as inclusively as possible in hopes of maximizing respondent comfort with providing information. Additionally, the option to not disclose was provided for these questions.

RESEARCH INSTRUMENTATION

There is some belief that Likert scale or similar question should use an even number of questions to avoid the phenomenon of survey completers tending to choose a middle, the idea being that a scale with an even number of points (and allowing only one choice) forces the completer to choose a positive or negative response (having removed the neutral option) and avoids the middle response serving “as a ‘dumping ground’ for not applicable, uncertain, indifferent, or ambivalent response orientations” (Kulas & Stachowski, 2009, p. 489). The researcher considered following this guidance but felt that survey takers might find being forced to choose a direction of sentiment while feeling none might consider doing so

unpleasant, and, thus, might abandon the survey without finishing thereby lowering the response rate.

Therefore, having considered the possibility of slightly increasing perceived response quality against the likelihood of a reduced response rate, scales with an odd number of points were used. With respect to the chosen satisfaction measures, those use odd numbers of points in their scales but altering the chosen satisfaction measures was not considered inasmuch as the measures have been previously validated in numerous studies and revalidation of a changed instrument would be both laborious and beyond the scope of the research questions.

Pearson and Bailey suggested that an effective survey instrument will be “visually appealing, “brief,” and clear (1983, p. 62). The researcher has attempted to follow this principle to reduce the effects of survey fatigue and attrition. Questions that may have caused concern about privacy or security (given contemporary concerns about these issues) were presented with response options, increasing these respondents’ likelihood of continuing and completing the survey. In addition, questions that provided for collection of free-form explanation and comments make these additional comments optional to reduce the likelihood of either attrition or the provision of responses with minimal meaning to meet a mandatory field requirement.

Population Sampling

The population for this study is all community college administrative SIS users in the United States. Inasmuch as there is no comprehensive employee directory available for community college employees, a random sample was not practicable. Therefore, the researcher made use of current contacts to send the survey to employees in the population who are known to them. In turn, those taking the survey were given the opportunity to further share the

survey with colleagues in the population. These methods of distribution constitute opportunistic sampling.

Ethical Considerations

One concern is whether respondents feel they can be identified even in the case where their identifying information is not associated with their responses. This concern is partially allayed by providing a “prefer not to say” option for all demographic questions, which would make it all but impossible to determine an individual identity from the questionnaire responses, even if the responses were obtained by a party wishing to do so. This option also reduced the likelihood of abandonment by those completing the survey but who were uncomfortable with providing demographic information.

Limitations and Delimitations

The inherent inability to obtain responses from a random sample of community college employees due in part to the lack of a comprehensive, nationwide database of this population causes the study to incur a risk of being less representative than a random sample, and certainly limits the reasonability of statistical inference of results to the population of all community college employees. As pointed out by Hirschauer, et al. (2020), statistical inference relies on an assumption of random selection from a population; even surveys for which random sampling is attempted can suffer from biases such as self-selection and non-coverage. Inasmuch as this research relies on convenience sampling, Hirschauer (et al.)’s points are that much more salient. Given that, results will be reported using descriptive statistics and, while correlations will be presented, *p*-values from statistical tests will be omitted.

The study by design excludes questions about institution location and SIS vendor. While consideration of these as antecedents would certainly make interesting research questions, they were deliberately omitted from this study for two reasons. The first was to encourage candid responses by eliminating fear on the part of participants that responses could be tied back to them: some states' community college IT infrastructures are such that a state and a vendor would be sufficient to identify the institution. The second was to avoid potential conflicts of interest. The researcher works in the SIS industry and wants to avoid the effect or appearance of bias towards or against any specific SIS vendor(s).

CHAPTER SUMMARY

This chapter presented the methodology used to examine SIS satisfaction and the factors influencing same among community college administrative users. It showed the instruments that were used to measure satisfaction and its potential precursors along with the rationale for same, as well as the means by which participants were selected for the study. In addition, this chapter provided a rationale for why certain data elements (e.g., SIS vendor) were omitted and what inherent limitations (e.g., no extant directory of all community college SIS users) and delimitations (e.g., refraining from questions the answers for which could identify respondents or their institutions) constrained the study.

CHAPTER FOUR: RESULTS AND ANALYSIS

INTRODUCTION

The purpose of this study was to determine what factors influence community college employees' satisfaction with the student information systems in use at their institutions. To that end, part of the survey used in the study relied on sets of questions that were used to produce an SIS satisfaction score, while the remaining questions were designed to capture or enable measurement of hypothesized factors influencing satisfaction.

Potentially influencing factors that were considered included characteristics of the college and employment situation (e.g., rural or urban, full or part-time appointment), demographics, perception of self-efficacy in the SIS, satisfaction with the IT area, prior engagement with different SISs, functional areas employees worked in, and whether the SIS was locally run or provided remotely as a service (i.e., SaaS or cloud). Each of these characteristics were considered as to their correlation with the measure of satisfaction.

This chapter will give descriptive statistics of the aggregate demographic and institutional information on the participants and their respective satisfaction measures.

SAMPLE DESCRIPTION

For the study, 63 participants submitted complete questionnaire responses. The survey included questions about respondents' institutions as well as classification questions. The classification questions included demographic questions, questions about the area of the

institution in which respondents work and characteristics the SIS itself. Also included were the components of the technology and SIS self-efficacy assessments as well as whether respondents used another SIS, how long they worked in higher education, and whether they have professional work experience outside of higher education. There was also a free form question that allowed respondents to add comments regarding their SIS they wished to share. While there were a few free form responses, their number and content were insufficient for analysis. Questions related to the dependent variable included those for the assessment of SIS satisfaction.

Institutional Characteristics

Information about institutions requested included Carnegie size classification for two-year colleges (*About Carnegie Classification*, n.d.), which was presented to participants as enrollment ranges in anticipation that employees would not necessarily know the classification of their institutions in that taxonomy. While most of the participants were employed by colleges in the Very large Carnegie group, there was reasonable representation of the Large, Medium, and Small categories but only one respondent from a college classified as Very small.

Table 1: Frequencies and percentages of respondents' institutional Carnegie size classification

| CARNEGIE SIZE CLASSIFICATION | FREQUENCY | PERCENTAGE |
|------------------------------|-----------|------------|
| Very small (0-499) | 1 | 1.6% |
| Small (500-1,999) | 6 | 9.5 |
| Medium (2,000-4,999) | 14 | 22.2 |
| Large (5,000-9,999) | 7 | 11.1 |
| Very large (10,000 or more) | 35 | 55.6 |

Also asked of participants were whether their institution was set in an urban, suburban, or rural environment. While the majority of responses were employed in an urban community college, there was strong representation of suburban and rural campus environments.

Table 2: Frequencies and percentages of respondents’ institutional geographic classification

| GEOGRAPHIC CLASSIFICATION | FREQUENCY | PERCENTAGE |
|---------------------------|-----------|------------|
| Urban | 29 | 46.0% |
| Suburban | 19 | 30.2 |
| Rural | 15 | 23.8 |

A majority of respondents reported multi-campus district employment, but the majority was not overwhelming and there was decent representation of single-campus colleges.

Table 3: Frequencies and percentages of respondents’ multi-campus classification

| PART OF A MULTI-CAMPUS DISTRICT | FREQUENCY | PERCENTAGE |
|---------------------------------|-----------|------------|
| Yes | 39 | 61.9% |
| No | 24 | 38.1 |

Demographic Questions

Respondents were a diverse group by age, with all age groups except for the Under 25 and 65 or older group having representation with the mass of responses in the center groups (35-44 years old and 45-54 years old). Three respondents exercised the option to not provide a response but did not significantly impair the ability to consider age group in the study.

Table 4: Frequencies and percentages of respondents' age group

| AGE GROUP | FREQUENCY | PERCENTAGE |
|-------------------|-----------|------------|
| 25-34 | 5 | 7.9% |
| 35-44 | 22 | 34.9 |
| 45-54 | 22 | 34.9 |
| 55-64 | 11 | 17.5 |
| Prefer not to say | 3 | 0.5 |

About two-thirds of respondents identified as female with slightly under a third having identified as male. There was little representation from genderqueer/gender non-conforming respondents and only two respondents declined to answer.

Table 5: Frequencies and percentages of respondents' gender identity

| GENDER IDENTITY | FREQUENCY | PERCENTAGE |
|-----------------------------------|-----------|------------|
| Female | 42 | 66.7% |
| Male | 17 | 27.0 |
| Genderqueer/gender non-conforming | 2 | 0.3 |
| Prefer not to say | 2 | 0.3 |

Respondents were also asked to provide information on their races and ethnicities. The majority of respondents identified as White while a significant number identified as Black. The two respondents who identified as Hispanic did not include an additional race or ethnicity—and although the question was not asked as a two-part question as IPEDS requires of institutions (Integrated Postsecondary Education Data System, n.d.), respondents had the opportunity to indicate ethnicity and a race if they had desired. Three respondents used the option to not indicate race or ethnicity.

Table 6: Frequencies and percentages of respondents' race/ethnicity

| RACE/ETHNICITY | FREQUENCY | PERCENTAGE |
|---------------------------------|-----------|------------|
| White | 45 | 71.4% |
| Black | 8 | 12.7 |
| Hispanic | 2 | 3.2 |
| Middle Eastern | 2 | 3.2 |
| Multi-Racial or Multi-Ethnic | 2 | 3.2 |
| Some Other Race/National Origin | 1 | 1.6 |
| Prefer not to say | 3 | 4.8 |

Employment Classification Questions

Employees responding to the survey were overwhelmingly salaried staff members. While there were a few responses that indicated other classifications and two respondents opted out of the question, the two faculty classifications were the only other ones sufficient for analysis and only when combined into a single faculty category.

Table 7: Frequencies and percentages of respondents' employment classification

| EMPLOYMENT CLASSIFICATION | FREQUENCY | PERCENTAGE |
|-----------------------------|-----------|------------|
| Staff: Salaried | 51 | 81.0% |
| Staff: Hourly or Classified | 1 | 1.6 |
| Faculty: Tenure Track | 4 | 6.3 |
| Faculty: Other | 4 | 6.3 |
| Other | 1 | 1.6 |
| Prefer not to say | 2 | 3.2 |

Respondents were almost all full-time employees. There was no value in considering full or part-time status as an independent variable in the analysis.

Table 8: Frequencies and percentages of respondents' full- or part-time status

| FULL OR PART-TIME | FREQUENCY | PERCENTAGE |
|-------------------|-----------|------------|
| Full-Time | 60 | 95.2% |
| Part-Time | 3 | 4.8 |

Respondents were also asked the functional area of the college in which they served.

There was diverse representation in the responses to this question with only one participant having used the option to refuse to answer. There are several areas with relatively small numbers which necessitated combining the smaller categories into broader groups for analysis.

Table 9: Frequencies and percentages of the respondents' work functional area

| FUNCTIONAL AREA | FREQUENCY | PERCENTAGE |
|---|-----------|------------|
| Academic Advising/Counseling | 12 | 19.0% |
| Academic Affairs/Provost | 7 | 11.1 |
| Admissions/Student Recruiting/ Enrollment Management | 1 | 1.6 |
| Faculty | 6 | 9.5 |
| Finance and Administration/Controller | 1 | 1.6 |
| Financial Aid/Scholarships | 2 | 3.2 |
| Information Technology | 1 | 1.6 |
| Other Academic | 3 | 4.8 |
| Other Administration or Finance | 3 | 4.8 |
| Other Student Affairs | 9 | 12.7 |
| Registrar/Student Records | 13 | 20.6 |
| Student Life/Conduct/Activities | 4 | 6.3 |
| Prefer not to say | 1 | 1.6 |

Another variable collected from respondents was whether or not they had used a different SIS than the one at their current institution. More than half the participants had used another SIS.

Table 10: Frequencies and percentages of respondents' previous use of different SIS

| DIFFERENT SIS USE | FREQUENCY | PERCENTAGE |
|-------------------------|-----------|------------|
| Used another SIS | 37 | 58.7% |
| Did not use another SIS | 26 | 41.3 |

Respondents were also asked to indicate whether or not they had worked outside of higher education. Nearly three quarters of participants had professional work experience outside of higher education.

Table 11: Frequencies and percentages of respondents' work experience outside of higher education

| WORK EXPERIENCE OUTSIDE OF HIGHER EDUCATION | FREQUENCY | PERCENTAGE |
|---|-----------|------------|
| Worked outside of higher education | 47 | 74.6% |
| Had not worked outside of higher education | 16 | 25.4 |

SIS Installation Characteristic Questions

Several questions regarding the SIS itself were posed to participants. The first of these sought to determine whether the SIS was part of a suite, i.e., whether the SIS was delivered by the same vendor as the Human Resources, Financial Accounting or both systems. The majority of participants reported that their SIS was from the same vendor.

Table 12: Frequencies and percentages of SIS suite use reported by respondents

| SIS FROM SAME VENDOR AS HR OR FINANCIAL SYSTEMS | FREQUENCY | PERCENTAGE |
|---|-----------|------------|
| Yes | 40 | 63.5% |
| No | 10 | 15.9 |
| Don't know | 13 | 20.1 |

Then respondents were asked how long their institution's SIS was in operation. Almost a third did not know how long their SIS was in place but among those who did, long tenures were common, with over a third reporting their SISs had been running for ten to nineteen years and 17.5 percent having had the same system twenty or more years.

Table 13: Frequencies and percentages of SIS years in place reported by respondents

| NUMBER OF YEAR(S) SIS HAS BEEN IN PLACE | FREQUENCY | PERCENTAGE |
|---|-----------|------------|
| Less than 1 year | 0 | 0% |
| 1-4 years | 3 | 4.8 |
| 5-9 years | 8 | 12.7 |
| 10-19 years | 22 | 35.0 |
| 20 years or more | 11 | 17.5 |
| Don't know | 19 | 30.2 |

The next question sought to elicit the degree of outsourcing of SIS operation and maintenance, ranging from systems being run fully in-house with infrastructure on-premises to the system being both run by a vendor and on vendor infrastructure.

Table 14: Frequencies and percentages of SIS installation types reported by respondents

| SIS OPERATION AND LOCATION | FREQUENCY | PERCENTAGE |
|--|-----------|------------|
| Run on-campus by our technology staff | 35 | 55.6% |
| Off-campus but run by our technology staff | 8 | 12.7 |
| Run by the vendor and is off campus | 1 | 1.6 |
| Other | 8 | 12.7 |
| Don't know | 11 | 17.5 |

The final SIS question asked participants to share whether or not their institution was replacing or considering replacing its incumbent SIS. About a third did not know, while just over half reported their institutions have no plans to replace. Over eleven percent reported that their institutions were looking at replacement options while just under five percent said their institutions were already embarked on a replacement project.

Table 15: Frequencies and percentages of SIS replacement intention reported by respondents

| SIS REPLACEMENT INTENTION | FREQUENCY | PERCENTAGE |
|---|-----------|------------|
| Not considering a replacement | 32 | 50.8% |
| Examining options for replacement | 7 | 11.1 |
| In the process of a replacement project | 3 | 4.8 |
| Don't know | 21 | 33.3 |

Summary of Sample Data

Because of the small numbers of responses to some questions, categories of responses were combined for analysis. In particular, the functional areas for respondents were collapsed into student-facing and administrative. While this approach results in a loss of granularity, it made analysis of the combined groups feasible that would not have been possible for reported departments with very few (or in some cases only one) respondents.

While there is no universal taxonomy of student services departments that can be reliably applied to all community colleges, there is support for categories of services. Cohen and Brawer referred to several “listings of categories of services” (2014, p. 89), one of which is due to the League for Innovation in the Community College, which used seven headings to organize thirty-one functions. While such a grouping is useful for structuring student affairs functions, it is too granular to group the sample data. Therefore, the respondents from groups constituting less than nine responses are grouped into similar functional area categories.

- Other Academic will be added to the Faculty category.
- Admissions and Enrollment Management, Continuing Education, Financial Aid and Scholarships, and Student Life and Conduct are to be combined into the Student-Facing Services category.
- Institutional Research, Information Technology, Other Administration and Finance will be combined into the Administrative Services Category.
- The single response which declined to respond to the question is eliminated from analyses by functional area.

The resulting classifications are (with combined categories indicated by *):

Table 16: Frequencies of respondents by functional area category.

| FUNCTIONAL AREA CATEGORY | N |
|----------------------------------|----|
| Student-Facing Services* | 16 |
| Faculty and Other Academic* | 13 |
| Academic Advising and Counseling | 12 |
| Registrar and Student Records | 9 |
| Academic Affairs and Provost | 7 |
| Administrative Services* | 5 |

In the case of employee classifications, categories are collapsed into two classification categories with hourly staff, salaried staff, and the one “Other” response in the staff category

and both tenure track and other faculty going into the faculty category. Data from two respondents who selected Prefer not to say for the question are omitted from analyses by classification:

Table 17: Frequencies of respondents by employee classification category

| FUNCTIONAL AREA CATEGORY | N |
|--------------------------|----|
| Staff | 57 |
| Faculty | 4 |

Research Question 1: Results

Research Question 1: To what extent are employment and institutional characteristics correlated with SIS administrative user satisfaction?

Employment characteristics collected in the survey include the number of years the respondents worked in higher education, their classification (e.g., staff, faculty), whether their position is full- or part-time, and whether they have previous professional experience outside of higher education. Institutional characteristics include the size of the respondent's institution's enrollment (Carnegie enrollment category), whether the institution is urban, rural, or suburban, and whether the institution is part of a multi-campus district.

Table 18 shows that, among the respondents, those with work experience outside of higher education are overall slightly less satisfied with their SIS than those who have worked exclusively in higher education. Both the mean and the median show a lower mean satisfaction based on respondents' having worked outside of higher education.

Table 18: Descriptive statistics of satisfaction by experience outside of higher education

| WORK EXPERIENCE OUTSIDE OF HIGHER EDUCATION | N | Mean | Median | SD | min | max |
|---|----|-------|--------|------|------|-------|
| Worked outside of higher education | 47 | 17.05 | 17.42 | 4.07 | 7.60 | 17.40 |
| Had not worked outside of higher education | 16 | 18.10 | 19.12 | 3.63 | 9.58 | 24.13 |

Table 19 shows the descriptive statistics of the satisfaction measure broken by faculty and staff. While these data show a higher mean satisfaction for staff, the number of faculty responses was very small ($n = 4$) compared to those of staff ($n = 57$). Given the imbalance in the number of responses in combination with the small number of faculty responses, it is difficult to infer meaning beyond chance into the difference.

Table 19: Descriptive statistics of satisfaction by employee classification group

| EMPLOYEE CLASSIFICATION | N | Mean | Median | SD | min | max |
|-------------------------|----|-------|--------|------|------|------|
| Staff | 57 | 17.41 | 18.32 | 4.11 | 7.6 | 25 |
| Faculty | 4 | 15.63 | 16.32 | 2.12 | 12.7 | 17.2 |

Table 20 shows descriptive statistics of the satisfaction measures broken out by responses to the question about respondents' numbers of years of higher education experience did not show a marked difference in mean or median satisfaction. However, the ranges of responses from those with at least ten years in the field were markedly wider with the largest range having been exhibited by respondents with at least twenty years in higher education.

Table 20: Descriptive statistics of satisfaction by years of higher education experience

| YEARS OF HIGHER EDUCATION EXPERIENCE | N | Mean | Median | SD | min | max | Range |
|--------------------------------------|----|-------|--------|------|-------|-------|-------|
| 0-4 | 2 | 21.21 | 21.21 | 5.36 | 17.24 | 25.00 | 7.58 |
| 5-9 | 5 | 16.90 | 17.20 | 2.30 | 13.77 | 19.22 | 5.45 |
| 10-14 | 18 | 17.52 | 18.04 | 3.61 | 9.58 | 25.00 | 15.42 |
| 15-19 | 18 | 17.75 | 18.71 | 3.96 | 9.85 | 24.75 | 14.90 |
| 20 or more | 20 | 16.45 | 17.37 | 4.51 | 7.60 | 24.15 | 16.55 |

In the case of full-time versus part-time classification, almost all responses (60 of 63 total respondents having indicated they were full time). The three part-time respondents had a lower mean satisfaction score (15.12) than those in full-time positions (17.01) but given the extremely unbalanced numbers of responses (twenty to one), that result is far from conclusive.

A similar imbalance in response numbers resulted for faculty versus staff classification, with only four faculty members having responded to 57 staff members (two declined to answer). Faculty responses resulted in a mean satisfaction score of 15.63, lower than the average staff satisfaction score of 17.41. As was the case with full versus part-time classification, though, the imbalance in number of responses makes a conclusion difficult.

Turning to institutional characteristics, Table 21 shows the descriptive statistics of satisfaction scores by respondents working at each of rural, suburban, and urban institutions. Those show that respondents from rural institutions are most satisfied with their SISs while those at suburban institutions are the least satisfied.

Table 21: Descriptive statistics of satisfaction by rural, suburban, or urban institution

| INSTITUTION CLASSIFICATION | N | Mean | Median | SD | min | max | Range |
|----------------------------|----|-------|--------|------|-------|------|-------|
| Rural | 15 | 18.55 | 19.13 | 3.56 | 12.58 | 25.0 | 12.42 |
| Suburban | 19 | 16.24 | 17.50 | 3.95 | 7.60 | 21.7 | 14.10 |
| Urban | 29 | 17.37 | 17.42 | 4.11 | 9.85 | 25.0 | 15.15 |

Considering whether institutions are multi-campus districts or institutions with a single campus, there was not a large difference in mean satisfaction observed, as shown in Table 22, which shows the descriptive statistics of satisfaction scores by respondents working at each of single campus and multi-institution districts.

Table 22: Descriptive statistics of satisfaction by single or multi-institution districts

| SINGLE OR MULTI-INSTITUTION CLASSIFICATION | N | Mean | Median | SD | min | max | Range |
|--|----|-------|--------|------|------|-----|-------|
| Single Institution | 24 | 17.8 | 18.71 | 4.21 | 9.85 | 25 | 15.15 |
| Multi-Campus District | 39 | 17.01 | 17.82 | 3.83 | 7.60 | 25 | 17.40 |

Research Question 2: Results

Research Question 2: To what extent are demographic factors correlated with SIS administrative user satisfaction?

Of the 63 respondents, 60 of the 63 provided an age bracket while three chose the option to not respond to that question. The highest satisfaction was shown by the 35-44 age group and the lowest by the 25-34 bracket as shown in Table 23. While neither the means nor medians show an overall upward or downward trend with age, the data from the sample the highest SIS satisfaction among the 35-44 age bracket and the lowest among the 25-34 group.

Table 23: Descriptive statistics of satisfaction by age bracket

| AGE BRACKET | N | Mean | Median | SD | min | max | Range |
|-------------|----|-------|--------|------|------|-------|-------|
| 25-34 | 5 | 15.9 | 17.42 | 5.08 | 9.58 | 21.7 | 12.12 |
| 35-44 | 22 | 18.88 | 19.08 | 3.03 | 12.8 | 24.75 | 11.95 |
| 45-54 | 22 | 16.45 | 17.21 | 4.55 | 7.6 | 25 | 17.4 |
| 55-64 | 11 | 17.26 | 17.2 | 3.7 | 12.4 | 24.13 | 11.73 |

Of the 63 respondents, 60 answered the race and ethnicity question on the survey. Of those, 45 were white / non-Hispanic, while the remaining 15 were Black ($n = 8$), Hispanic ($n = 2$), Middle Eastern ($n = 2$), Multi-Ethnic ($n = 2$), or Other Race/National Origin ($n = 1$). The 15 non-white responses are combined for analysis due to the small number of responses for each race/ethnicity. The descriptive statistics below in Table 24 show a slight difference in mean overall satisfaction with the Non-white category being less satisfied with their institutions' SISs than the White category but the median values were very close (difference = 0.09), suggesting that race and ethnicity are not an influencer of SIS satisfaction.

Table 24: Descriptive statistics of race/ethnicity category

| RACE/ETHNICITY CATEGORY | N | Mean | Median | SD | min | max | Range |
|-------------------------|----|-------|--------|------|------|-----|-------|
| White | 45 | 17.68 | 18.23 | 3.67 | 9.58 | 25 | 15.42 |
| Non-white | 15 | 16.53 | 18.32 | 5 | 7.6 | 25 | 17.4 |

In the case of gender identity, there were 61 responses from those who chose to respond to the question. As shown in Table 25 below, there was no large difference in mean SIS satisfaction among gender identities.

Table 25: Descriptive statistics of satisfaction by gender identity

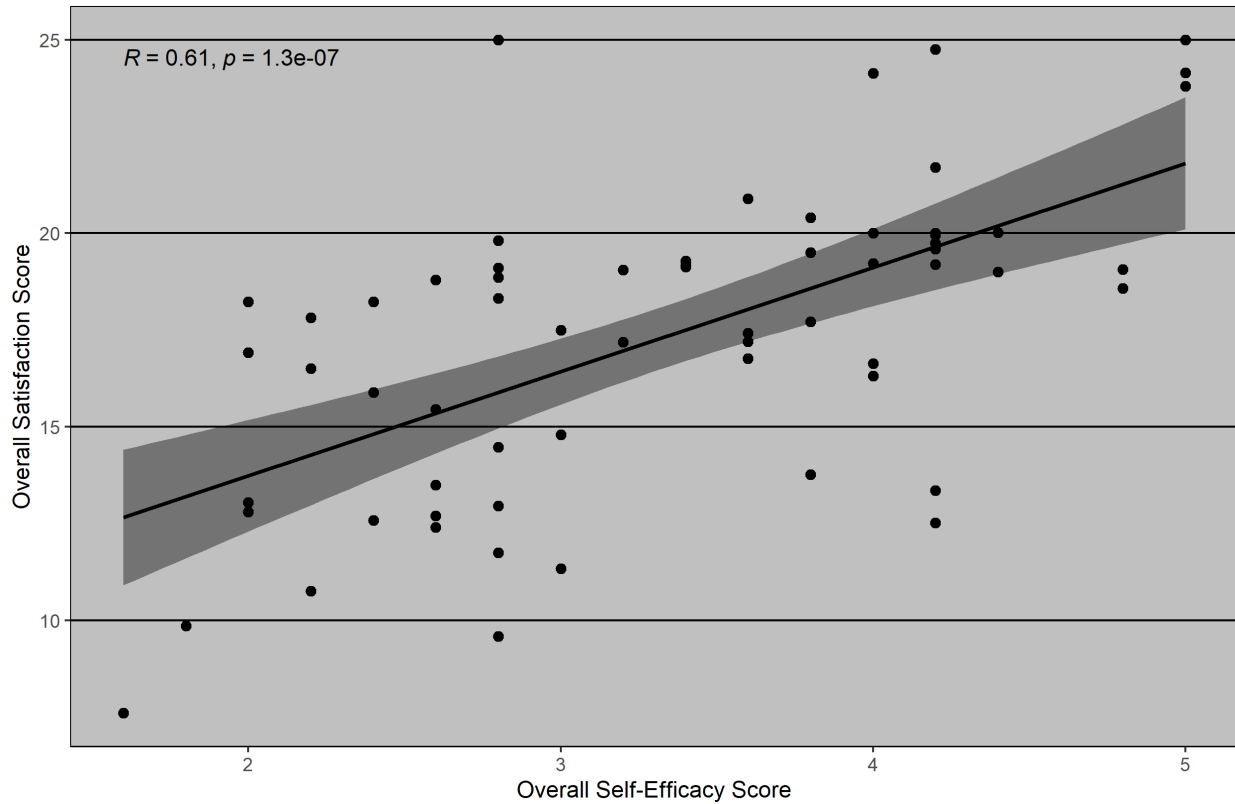
| GENDER IDENTITY | N | Mean | Median | SD | min | max | Range |
|-------------------------------------|----|-------|--------|------|-------|-------|-------|
| Genderqueer / gender non-conforming | 2 | 17.87 | 17.87 | 0.64 | 17.42 | 18.32 | 0.9 |
| Male | 17 | 17.74 | 19 | 3.78 | 7.6 | 25 | 17.4 |
| Female | 42 | 17.14 | 17.61 | 4.25 | 9.58 | 25 | 15.42 |

Research Question 3: Results

Research Question 3: To what extent are users' perception of self-efficacy in the SIS correlated to their satisfaction with it?

The scatter plot in Figure 4 below shows a positive ($r = 0.61$) linear correlation between user-reported self-efficacy and SIS satisfaction in the 63 responses. Although the assumption of random sampling necessary for statistical inference does not hold for these responses, a confidence interval for r was computed using Pearson's product-moment correlation which yielded a 95% confidence interval of 0.42-0.74 with $p < 0.001$. The data from the responses show a moderate positive correlation between user-perceived SIS self-efficacy and satisfaction with their institutions' SIS.

Figure 5. Plot of Overall Self-Efficacy and SIS Satisfaction Scores



Research Question 4: Results

Research Question 4: To what extent are users' prior engagements with one or more previous SISs correlated with their satisfaction with their current ones?

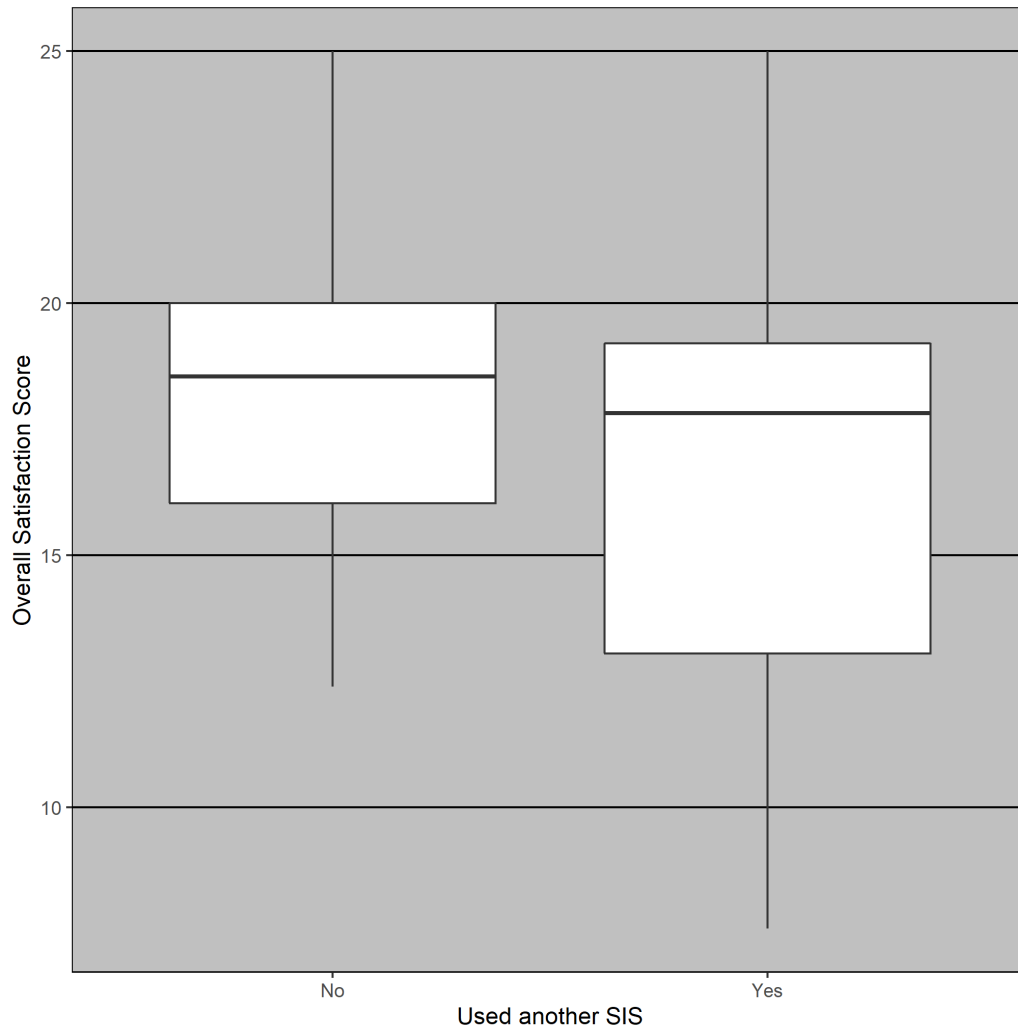
Table 26 below shows a lower mean satisfaction score among respondents who had used a different SIS previous to the one being used at the time of the survey.

Table 26: Descriptive statistics of satisfaction as a function of having used another SIS

| USED ANOTHER SIS | N | Mean | Median | SD | min | max | Range |
|------------------|----|-------|--------|------|------|-----|-------|
| Yes | 37 | 16.65 | 17.82 | 4.02 | 7.6 | 25 | 17.4 |
| No | 26 | 18.26 | 18.55 | 3.75 | 12.4 | 25 | 12.6 |

As shown in Figure 6 below, median satisfaction values did not differ as much as mean values but the range of satisfaction scores among those who had used another SIS was much wider (17.4 for those who had versus 12.6 for those who hadn't).

Figure 6. Plot of Overall Self-Efficacy Scores as a Function of Having Used Another SIS



Research Question 5: Results

Research Question 5: To what extent are administrative users' functional areas of operation correlated with their satisfaction with the SIS?

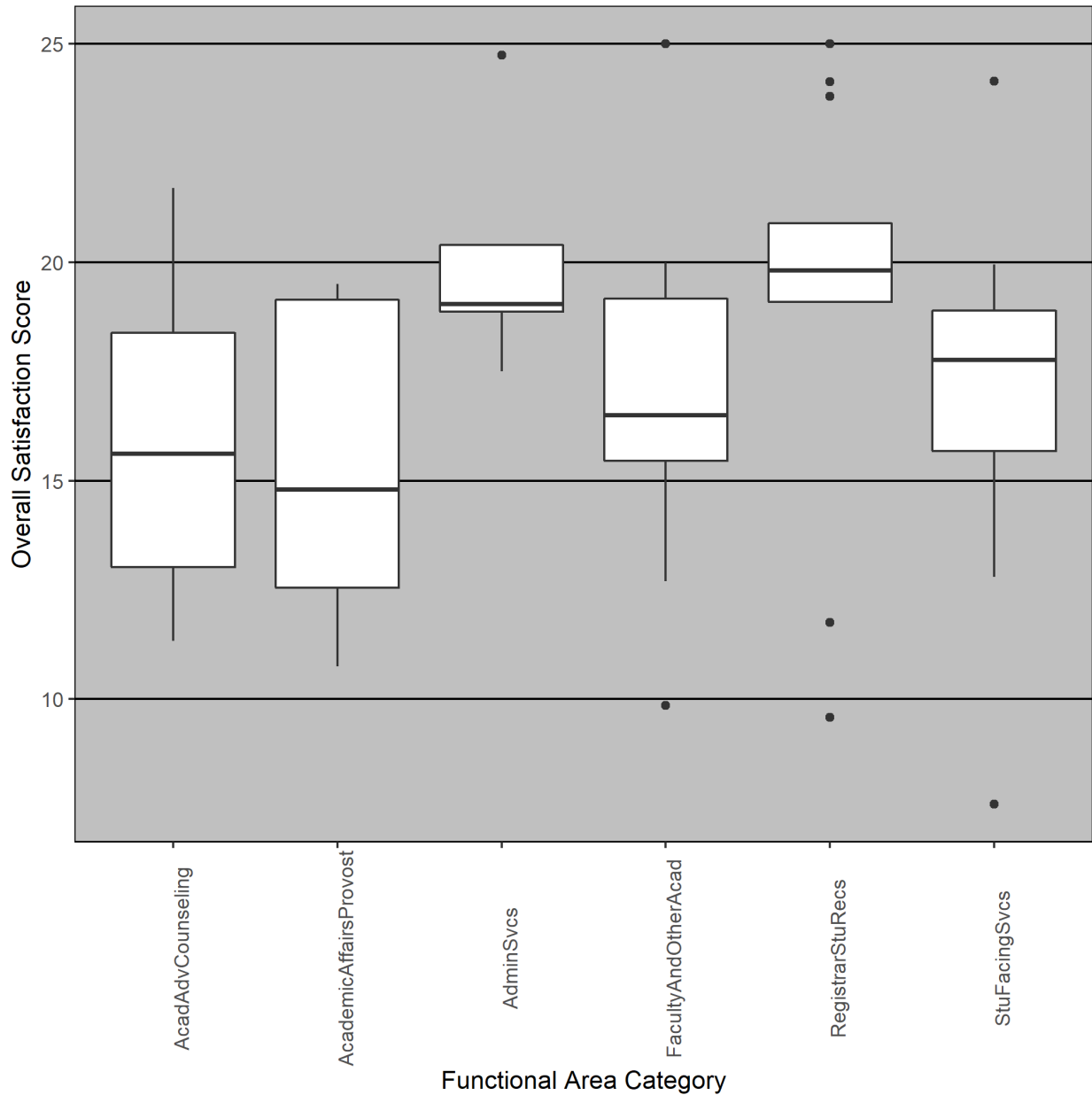
Table 27 below shows the descriptive statistics of overall satisfaction by functional area category. Categories that are the aggregation of multiple functional area responses are indicated with an asterisk.

Table 27: Descriptive statistics of satisfaction by functional area category

| FUNCTIONAL AREA | N | Mean | Median | SD | min | max | Range |
|----------------------------------|----|-------|--------|------|-------|-------|-------|
| Student-Facing Services* | 16 | 17 | 17.77 | 3.73 | 7.6 | 24.15 | 16.55 |
| Registrar and Student Records | 13 | 19.38 | 19.82 | 4.39 | 9.58 | 25 | 15.42 |
| Academic Advising and Counseling | 12 | 15.8 | 15.62 | 3.29 | 11.33 | 21.7 | 10.37 |
| Faculty and Other Academic* | 9 | 16.86 | 16.5 | 4.35 | 9.85 | 25 | 15.15 |
| Academic Affairs and Provost | 7 | 15.49 | 14.8 | 3.72 | 10.75 | 19.5 | 8.75 |
| Administrative Services* | 5 | 20.11 | 19.05 | 2.79 | 17.5 | 24.75 | 7.25 |

The data show that, among the respondents, those in the Administrative Services aggregate functional area category and those in the Registrar and Student Records functional area exhibit the highest SIS satisfaction scores with means of 20.11 and 19.38, respectively. The lowest satisfaction scores are exhibited by the Academic Advising and Counseling and Academic Affairs and Provost functional areas with means of 15.8 and 15.49, respectively. The box plot in Figure 7 below shows the distribution of responses graphically. There were outliers with both high and low satisfaction scores for the Faculty and Other Academic, Registrar and Student Records, and Student-Facing Services areas while the Administrative Services functional area category had one high satisfaction outlier.

Figure 7. Plot of Overall Satisfaction Scores by Functional Area Category



Research Question 6: Results

Research Question 6: To what extent are characteristics of the SIS installation correlated with administrative user satisfaction?

Respondents were asked about several characteristics of their SIS installation, including whether it is part of a suite of ERP applications (i.e., the SIS is from the same vendor as the

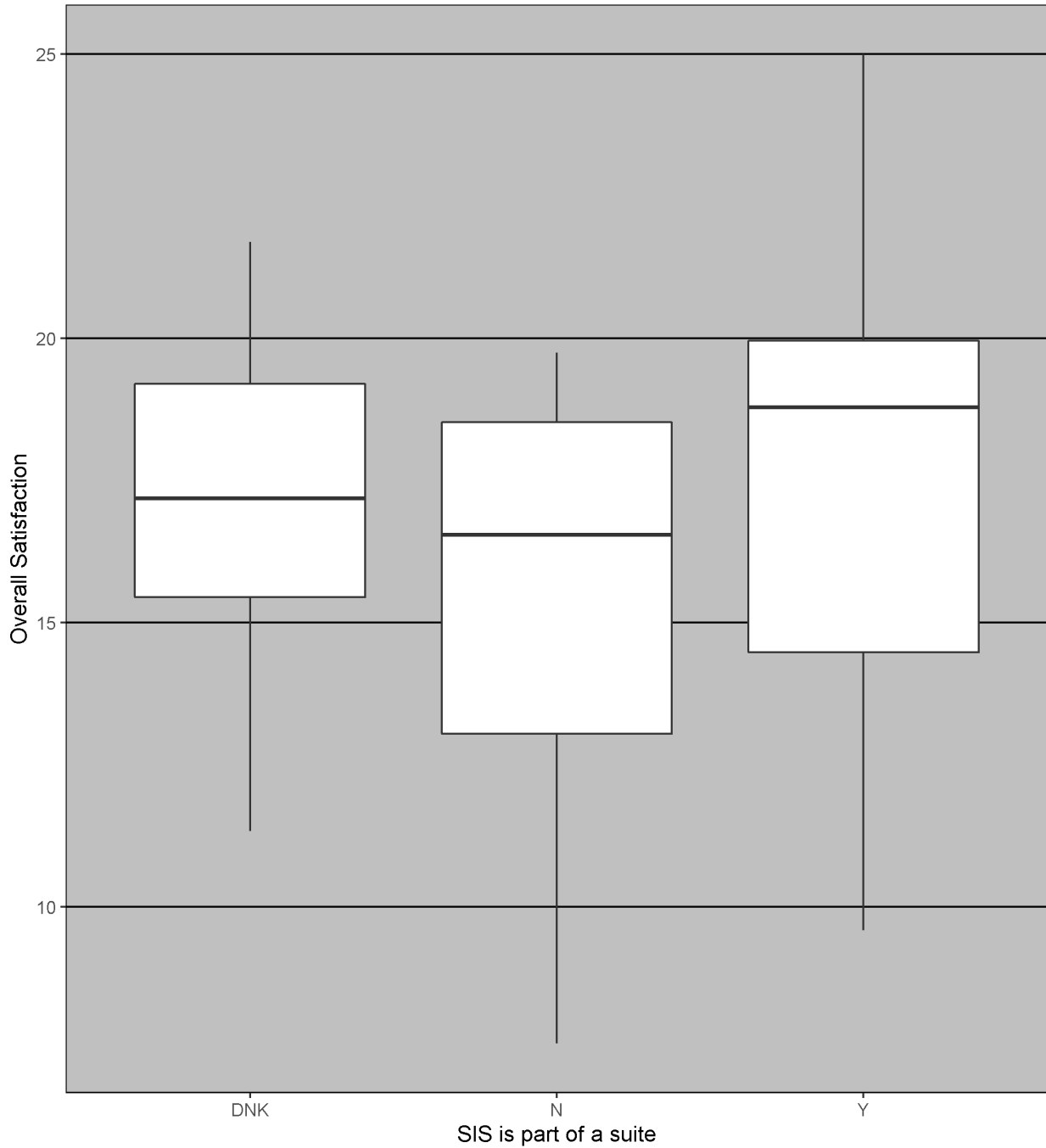
financial or human resource systems used by the institution), whether it is hosted on-premises or externally, how long it has been in place, and what, if any, replacement project or contemplation the respondent was aware of.

The first of these, whether an implementation is part of a suite, had 13 of 63 respondents respond that they did not know. Of the other 53 responses, 10 indicated their institutions' SIS was not part of a suite and the other 43 indicated that it was. Table 28 shows descriptive statistics of satisfaction for each answer to that question. Those respondents who indicated their SIS is part of a suite had the highest mean satisfaction, while those who indicated that it is not had the lowest. The mean satisfaction score of those who did not know fell in between the mean satisfaction scores of those indicating their SIS is part of a suite and of those who indicated that it is not. Table 28 and Figure 8 below show descriptive statistics and a box plot for SIS satisfaction, respectively, based on the response to the suite question.

Table 28: Descriptive statistics of satisfaction as a function of the SIS being part of a suite

| SIS PART OF A SUITE | N | Mean | Median | SD | min | max | Range |
|---------------------|----|-------|--------|------|-------|-------|-------|
| Yes | 40 | 17.93 | 18.79 | 4.09 | 9.58 | 25 | 15.42 |
| No | 10 | 15.27 | 16.54 | 4.17 | 7.6 | 19.75 | 12.15 |
| Don't Know | 13 | 16.98 | 17.18 | 2.97 | 11.33 | 21.7 | 10.37 |

Figure 8. Plot of Overall Satisfaction Scores by Whether the SIS is Part of a Suite



The second of the installation characteristics, how the system is maintained (such as on-premises by the institution's IT area, hosted or cloud-based), had similar means across the

options as shown in Table 29. Only one respondent indicated that their institution’s SIS was cloud-based while most (35) indicated that it was run on-premises. There was no large difference in mean satisfaction scores among the different responses for SIS hosting model.

Table 29: Descriptive statistics of satisfaction as a function of the SIS hosting model

| SIS HOSTING MODEL | N | Mean | Median | SD | min | max | Range |
|-------------------|----|-------|--------|------|-------|-------|-------|
| Cloud-based | 1 | 16.98 | 16.63 | NA | 16.63 | 16.63 | 0 |
| Hosted | 8 | 17.09 | 18.14 | 2.83 | 12.8 | 19.82 | 7.02 |
| On-premises | 35 | 17.53 | 18.87 | 4.48 | 7.6 | 25 | 17.4 |

The third installation characteristic, system tenure (the length of time the SIS has been in use at the institution), yielded 19 “don’t know” responses. The highest mean satisfaction score was from those whose institutions’ SIS had been in place for from five to nine years while the lowest was from those where it had been in place from one to four years.

Table 30: Descriptive statistics of satisfaction as a function SIS system tenure

| SIS SYSTEM TENURE | N | Mean | Median | SD | min | max | Range |
|-------------------|----|-------|--------|------|-------|-------|-------|
| 1-4 years | 3 | 14.01 | 13.77 | 1.34 | 12.8 | 15.45 | 2.65 |
| 5-9 years | 8 | 18 | 18.02 | 3.92 | 10.75 | 24.75 | 14 |
| 10-19 years | 22 | 17.83 | 18.93 | 3.83 | 9.58 | 25 | 15.42 |

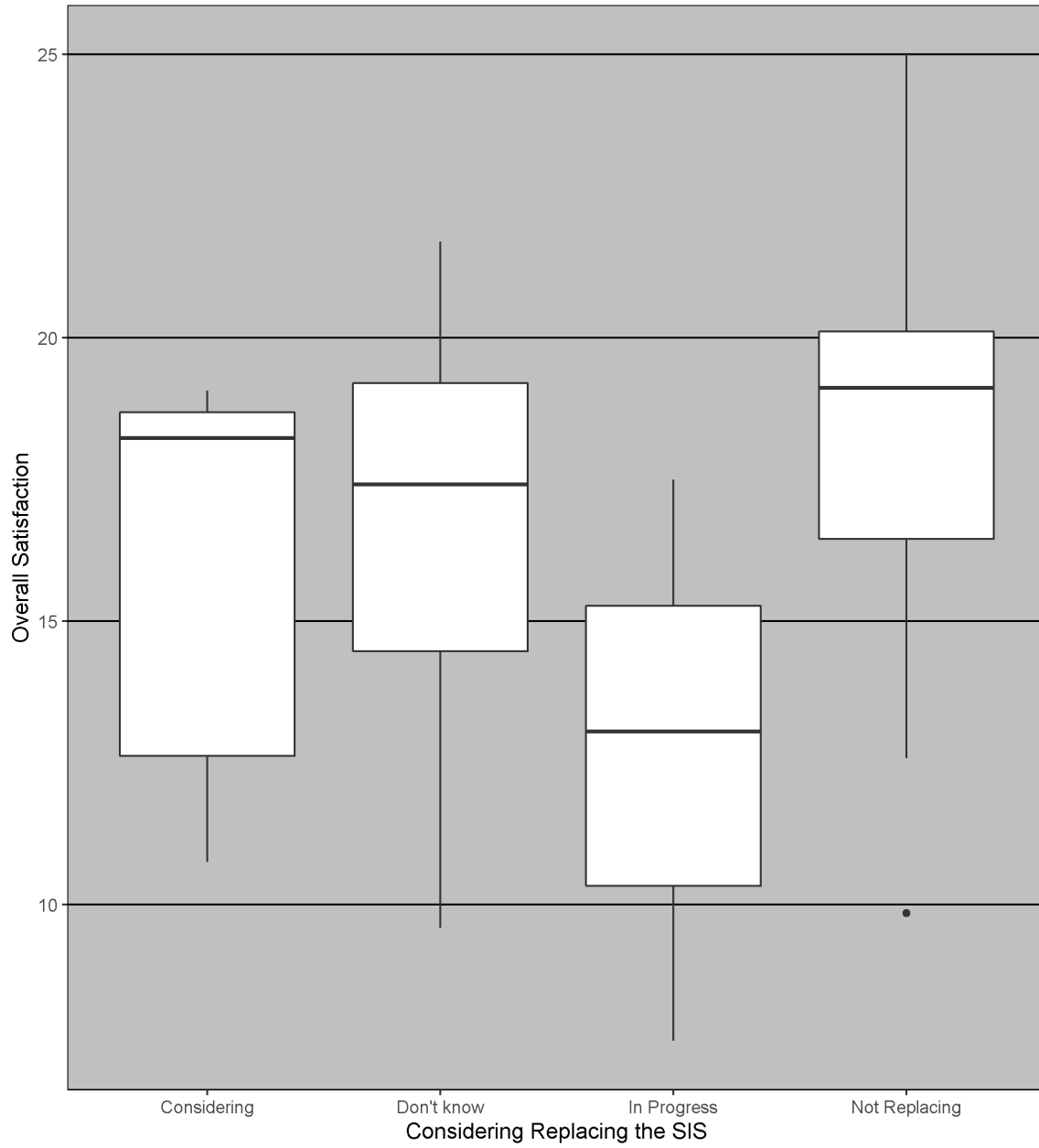
The last of the installation characteristics, whether respondents’ institutions are considering replacing, currently replacing, or are not replacing their SIS, yield the largest number (21) of “don’t know” responses of the questions. The option with the most (32) responses was “Not considering a replacement.” Descriptive statistics of overall satisfaction as a function of SIS replacement plans are shown in Table 31 below. The mean satisfaction score was lowest among respondents whose institutions are in the process of replacing their SIS while the next lowest satisfaction score was from those whose institutions were examining options.

Those with the highest mean satisfaction scores were those who reported their institutions are not considering an SIS replacement project; those who did not know had a mean satisfaction score falling between that of those who are examining replacement options and who are not considering replacement. The number of respondents whose institutions were in the process of replacing their SIS (three) was very small and the number of those examining options was slightly larger (seven) but still relatively small compared to the number of “don’t know” and “not considering” responses. That said, the difference in mean satisfaction scores is marked, with those reporting that their institutions are either considering replacing or are currently replacing their SIS are much lower. Figure 9 below illustrates this difference.

Table 31: Descriptive statistics of satisfaction as a function of SIS replacement plans

| SIS REPLACEMENT | N | MEAN | MEDIAN | SD | MIN | MAX | RANGE |
|-------------------|----|-------|--------|------|-------|-------|-------|
| Not considering | 32 | 18.51 | 19.12 | 4.01 | 9.58 | 25 | 15.15 |
| Examining options | 7 | 15.81 | 18.23 | 3.67 | 10.75 | 19.07 | 8.32 |
| In process | 3 | 12.72 | 13.05 | 4.96 | 7.6 | 17.5 | 9.9 |
| Don't know | 21 | 16.64 | 17.42 | 3.24 | 9.58 | 21.7 | 12.12 |

Figure 9. Plot of Overall Satisfaction Scores by Reported SIS Replacement Intention



SUMMARY AND ANALYSIS OF RESULTS

This chapter examined the measurements of several possible predictors of community college employee satisfaction with the student information systems in use at their institutions. The results pertaining to each of the six research questions considered are presented.

Research Question 1: Analysis

In the case of employment and institutional characteristics, there is some support for employees having worked outside of higher education being predictive of lower SIS satisfaction but not with statistical significance at the sample size and method in this study. With respect to employee classification and full versus part-time status, staff and full-time respondents outnumbered faculty and part-time respondents in the respective classifications so overwhelmingly that it is not reasonable to draw any inference from the difference in mean satisfaction values observed for each either staff versus faculty or full-time versus part-time.

Considering the length of time in higher education, the collected data showed no demonstrable relationship between the length of time respondents had worked in higher education and their satisfaction with the SIS. In the case of institution classification as urban, rural, or suburban, data from the respondents suggest that rural community college employees are the most satisfied with their institutions' SISs but not to the extent that it is statistically significant from the collected data. For single campus versus multi-institution districts, no large difference in mean satisfaction was observed.

Based on those observations, it is not possible to conclude from the data in this study that there is or is not a relationship between employment and institutional characteristics and SIS satisfaction.

Research Question 2: Analysis

In the case of demographic factors, the data suggest a possible relationship between age bracket and SIS satisfaction with the most satisfied group being those from 35 to 44 years of age and the least satisfied being those in the 25 to 34 age group. However, there were only five respondents in the 25 to 34 age group. That, coupled with the small sample size, render drawing an inference with respect to the influence on satisfaction from the available data impossible. Race and ethnicity responses did not suggest a difference in satisfaction based on those categories. There was not a large difference in mean satisfaction and median satisfaction was nearly equal between the white and non-white categories. Similarly, gender identity responses did not show large differences in mean satisfaction among the categories considered. These observations suggest that age is the only demographic factor collected in this study which may correlate with SIS satisfaction in the general case and that there is no support for a relationship between either gender or race and ethnicity to SIS satisfaction.

Research Question 3: Analysis

Self-efficacy was shown from the data collected to be moderately correlated ($r = 0.61$) to SIS satisfaction and (with the caution that the collected data do not constitute a random sample) showed statistical significance. The data from the responses suggest that there is a positive relationship between user-perceived self-efficacy and SIS satisfaction.

Research Question 4: Analysis

The data collected suggest that having used another SIS is associated with a lower satisfaction with current institutions' SISs. While the sample size and non-randomness of the

sample precludes statistical inference, a discernable difference in mean satisfaction was observed between those who had used another SIS and those who had not. The number of responses for each (26 had not used another SIS while 37 had) was more well-balanced than other categories. While it is not possible to conclude generally from a sample of the size collected in this research that having used another SIS in the past correlates with lower current SIS satisfaction, the data available to this study suggest that is the case.

Research Question 5: Analysis

Respondents' functional area categories from the data collected showed Administrative Services and Registrar and Student Records as markedly more satisfied than those in the Academic Advising and Counseling and Academic Affairs and Provost categories based on both mean and median satisfaction scores. However, small numbers of respondents overall, exacerbated by relatively small numbers of responses in some categories (e.g., Administrative Services with 5 responses) make an inference to all community college employees impossible. However, in the case of the data collected in this study, there is clearly a relationship between functional area category and SIS satisfaction.

Research Question 6: Analysis

Examining characteristics of the SIS installation, the first of these considered is whether the SIS is part of a suite. Of respondents reporting that their SIS is part of a suite, mean satisfaction was noticeably higher than for those who reported that it is not. Those who reported not knowing whether or not their institutions' SISs are part of a suite had a mean satisfaction score falling in between that of the other two groups. While the data collected in

the study suggest that there is a positive relationship between the SIS being part of a suite of core institutional applications, the bulk of the respondents (40 of 63) in the small sample available reported use of a suite. That, coupled with the small sample size, makes generalization difficult.

Regarding the hosting model of the SIS, the majority of respondents (35 of 63) reported that their SIS is hosted on-premises while only eight reported use of external hosting and one reported use of a cloud-based SIS. This imbalance in responses along with the means being close between the most satisfied and least satisfied groups, suggests that there is probably not a relationship between the hosting model of the SIS and SIS satisfaction.

Considering the length of time that the SIS had been in place (system tenure), the data at first glance suggest that those with a very new SIS (1-4 years) are the least satisfied. However, there were only three responses in that category and outside of those, there was not wide variation in mean satisfaction among the respondent groupings. There were also a relatively large number (19 of 63) of “don’t know” responses to that question. The data at hand are not sufficient to establish a relationship between SIS system tenure and satisfaction but hint at a possible relationship.

The last SIS characteristic examined was whether respondents reported that the institution is replacing or considering replacing its SIS. This question elicited the highest number (21 of 63) of “don’t know” responses received. Most (32) reported that their institutions were not considering an SIS replacement. Among those that were either examining replacement options (7) or had a replacement project underway (3); however, mean SIS satisfaction scores

were markedly lower, suggesting that institutions' replacement intentions correlate with lower satisfaction with the incumbent SIS on the part of its employees.

While the sample size and sampling method do not allow inference to community college employees in general, the available data suggest that replacement intention correlates with lower SIS satisfaction and that system tenure and whether an SIS is part of a suite may also be influential and merit further research.

CHAPTER SUMMARY

The results of this study suggest that user-perceived self-efficacy (Research Question Three) is correlated with SIS satisfaction, along with prior engagement with other SISs (Research Question Four), functional area category (Research Question Five), and, in part, installation characteristics of the SIS (Research Question Six). Employment, institutional characteristics (Research Question One), and demographic factors (Research Question Two) were not shown to correlate with SIS satisfaction.

CHAPTER FIVE: DISCUSSION, IMPLICATIONS, AND FUTURE RESEARCH

INTRODUCTION

In this chapter a summary of the research conclusions is presented, along with recommendations for practice as well as other potentially fruitful areas for study as well as recommendations for the conduct further research.

CONCLUSIONS AND IMPLICATIONS

Research question one explored whether characteristics of institutions and employment are a predictor of SIS satisfaction and found no provable link between the measured characteristics and satisfaction. Research question two considered demographics, for which the data suggested that age may be a predictor with SIS satisfaction but did not establish any relationship on other demographic factors such as gender or ethnicity.

Research question three, which examined self-efficacy, yielded results which showed user-perceived self-efficacy as measured from respondents' questionnaire responses to be moderately positively correlated with SIS satisfaction. Research question four provided a look into the influence on satisfaction of users having used a different SIS prior to using their institutions' current ones. The results suggest that having used another SIS previously is predictive of lower SIS satisfaction with the current system.

Research question five, on functional areas, suggested there is a possible relationship between functional area and SIS satisfaction but there were not enough data available to

establish a firm conclusion. Research question six considered SIS installation characteristics such as whether the SIS is part of a suite of applications from the same vendor or is run by institution IT staff as opposed to a vendor. The respondents' answers suggest that the SIS being part of an integrated suite of applications is a positive influencer on satisfaction. Data on system tenure's influence on satisfaction or lack thereof were not sufficient to establish a relationship in either direction.

The strongest predictor observed from research question six was the fact that an institution was considering replacing or in the process of replacing its SIS. Among respondents whose institutions were replacing or considering replacing their SIS, satisfaction scores were lower. While this seems on its face to be an obvious conclusion, SIS replacement decisions are not necessarily made in consultation with the broader campus community—the lower satisfaction reported by respondents in this study by those whose institutions are replacing or considering replacing the institutional SIS suggest that those respondents likely agree with the decision to replace or consider replacing.

RECOMMENDATIONS FOR PRACTICE

The result showing a strong correlation between self-efficacy and SIS satisfaction suggests that an institution that wants to maximize same invest in education and training to increase users' familiarity, competence, and confidence regarding the SIS. While an implementation is a natural time to provide access to those opportunities, ongoing education and training in post-implementation or maturity is also important to continued satisfaction.

Given that data from this study show that having used a different SIS previously has a negative influence on SIS satisfaction, the importance of training is again underscored. An

institution using a different SIS from those of peer institutions from which it draws employees has a particular opportunity to improve satisfaction via continuing education and training. One possible aid for this type of training could be a Rosetta Stone document that provides a crosswalk between terminology and navigation to important functions in each of the two systems to serve as a ready reference for new employees. Another would be access to a directory of peers who had used the same previous system as the new employee and who had successfully adapted to the institution's system.

While this study did not conclusively show that functional area is or is not a predictor of SIS satisfaction, institutions with information technology ticketing systems can use data from those to look for areas having outsized issues relative to others. While some areas will inherently make more requests of the IT area because of the nature and volume of their work, these can be accounted for in data analyses so long as accurate ticket classifications are assigned (e.g., defects and incidents are distinguishable from enhancement requests).

RECOMMENDATIONS FOR FUTURE RESEARCH

The most significant limitation of this study was the small number of responses while the second-most was the non-randomness of the sample. Future research considering these and similar questions could benefit from casting a wider net and randomizing the sample as much as possible as practicable while remaining in compliance with the ethics and requirements with respect to research on human subjects. Additionally, future research could benefit from a more robust qualitative component, possibly including the ability to follow up with respondents to clarify their responses. In the case of this study, there could have been less "don't know" responses than the high number that occurred, particularly with respect to two of

the SIS installation questions. In addition to increasing the quantity of qualitative responses received, rich qualitative responses could lend color to the data and lead to additional areas of inquiry and contribute to saturation in a qualitative, grounded theory approach to the questions (Hennink & Kaiser, 2020).

Functional area as a predictor of SIS satisfaction is another research question that could benefit from a larger study as well as from refinement of functional area definitions to avoid the fragmentation and subsequent reassembly that were subsequently necessitated in this study. In the case of commercial ERPs (the closest corporate analogue to SISs), research whether or not a relationship between functional area and satisfaction exists has reached different conclusions (Mitakos et al., 2010). Particularly regarding community colleges and higher education in general, this remains an interesting question.

SIS satisfaction in community colleges and higher education in general remains a rich topic for research. A question with broad application would be whether SIS vendor is influential on satisfaction independently of other factors. Research efforts in that realm are largely conducted by commercial analyst and consulting firms such as Gartner and the Tambellini Group. While these firms provide valuable insight to institutions in the process of evaluating SISs, the expense involved, and confidentiality requirements associated with commercial research preclude its addition to the public body of knowledge. Examination of these questions would be ideally conducted by a researcher outside of the industry to reduce the potential of unconscious bias or the perception thereof with respect to that research. Such a study could also consider student satisfaction either as part of a holistic measure or alongside measurement of administrative user satisfaction.

CONCLUSION

This study sought to determine what factors influence satisfaction of community college administrative users with the SISs in use at their institutions and to what relative degree.

Although the results are not statistically generalizable, they suggest that users with previous experience using a different SIS will be less satisfied with their current SIS. Also of note is that users from the registrar and administrative areas reported greater satisfaction overall than their colleagues in other parts of the institution.

None of employment, institutional, or demographic characteristics were shown to influence satisfaction either positively or negatively. However, reported self-efficacy was found to moderately correlate with satisfaction. Those results suggest that institutions could influence satisfaction by investing in training, particularly for colleagues having used a different SIS in the past, along with concentrating efforts on specific areas of dissatisfaction as manifested in customer support tickets and enhancement requests from members of the college community.

REFERENCES

- Abdillah, W. (2009). The situational cognitive mediation effects on dispositional personality influence on the intention to use the internet: An empirical study of information technology acceptance within higher education institution. *International Journal of Management in Education*, 3(3/4), 359. <https://doi.org/10.1504/IJMIE.2009.027356>
- About Carnegie Classification*. (n.d.). The Carnegie Classification of Institutions of Higher Education. Retrieved May 27, 2019, from http://carnegieclassifications.iu.edu/classification_descriptions/size_setting.php
- Abugabah, A., Sansogni, L., & Abdulaziz, O. (2013). The phenomenon of enterprise systems in higher education: Insights from users. *International Journal of Advanced Computer Science and Applications*, 4(12). <https://doi.org/10.14569/IJACSA.2013.041212>
- Agrawal, D., & Gupta, S. (2011). Strengthening the supply chain management through microfinance: A case study of banana production in Kaushambi district. In R. Thakur, S. Thukral, N. Sahu, & V. Gupta (Eds.), *Entrepreneurship and SMEs: Building competencies* (pp. 409–413). Macmillan Publishers India Ltd.
- Ajzen, I., & Fishbein, M. (1970). The prediction of behavior from attitudinal and normative variables. *Journal of Experimental Social Psychology*, 6(4), 466–487. [https://doi.org/10.1016/0022-1031\(70\)90057-0](https://doi.org/10.1016/0022-1031(70)90057-0)
- Amoako-gyampah, K., & Salam, A. F. (2004). An extension of the technology acceptance model in an ERP implementation environment. *Information & Management*, 41, 731–745.
- Au, N., Ngai, E. W. T., & Cheng, T. C. E. (2008). Extending the understanding of end user information systems satisfaction formation: An equitable needs fulfillment model approach. *MIS Quarterly*, 32(1), 43–66.
- Bailey, J. E., & Pearson, S. W. (1983). Development of a Tool for Measuring and Analyzing Computer User Satisfaction. *Management Science*, 29(5), 530–545.
- Barbatis, P. R. (2014). Student affairs and information technology: Collaborating in the cloud. *New Directions for Community Colleges*, 2014(165), 59–65. <https://doi.org/10.1002/cc.20091>
- Baroudi, J. J., & Orlikowski, W. J. (1988). A short-form measure of user information satisfaction: A psychometric evaluation and notes on use. *Journal of Management Information Systems*, 4(4), 44–59. <https://doi.org/10.1080/07421222.1988.11517807>

- Benbasat, I., & Barki, H. (2007). Quo vadis TAM? *Journal of the Association for Information Systems*, 8(4), 7.
- Bryant, J. L. (2006). Assessing expectations and perceptions of the campus experience: The Noel-Levitz Student Satisfaction Inventory. *New Directions for Community Colleges*, 2006(134), 25–35. <https://doi.org/10.1002/cc.234>
- Cohen, A. M., Brawer, F. B., & Kisker, C. B. (2014). *The American community college* (Sixth edition). Jossey-Bass.
- Cramer, S. F. (2005). *Student information systems: A guide to implementation success*. American Association of Collegiate Registrars and Admissions Officers.
- Davis, F. D. (1985). *A technology acceptance model for empirically testing new end-user information systems: Theory and results* [Doctoral dissertation]. Massachusetts Institute of Technology.
- Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science*, 35(8), 982–1003. <https://doi.org/10.1287/mnsc.35.8.982>
- Davis, M. J. (2007). ERP in higher education: A case study of SAP and campus management. *Issues in Information System*, VIII(1).
- DeLone, W. H., & McLean, E. R. (1992). Information systems success: The quest for the dependent variable. *Information Systems Research*, 3(1), 60–95. <https://doi.org/10.1287/isre.3.1.60>
- DeLone, W. H., & McLean, E. R. (2003). The DeLone and McLean model of information systems success: A ten-year update. *Journal of Management Information Systems*, 19(4), 9–30. <https://doi.org/10.1080/07421222.2003.11045748>
- Doll, W. J., & Torkzadeh, G. (1988). The measurement of end-user computing satisfaction. *MIS Quarterly*, 12(2), 259. <https://doi.org/10.2307/248851>
- EDUCAUSE. (n.d.). *Survey Glossary*. Core Data Service Portal. <https://www.educause.edu/research-and-publications/research/core-data-service/cds-portal/survey-glossary>
- Etezadi-Amoli, J., & Farhoomand, A. F. (1996). A structural model of end user computing satisfaction and user performance. *Information & Management*, 30(2), 65–73. [https://doi.org/10.1016/0378-7206\(95\)00052-6](https://doi.org/10.1016/0378-7206(95)00052-6)
- Gatian, A. E. W. (1989). *User information satisfaction (UIS) and user productivity: An empirical examination* [PhD Thesis]. Virginia Polytechnic Institute and State University.

- Gelderman, M. (1998). The relation between user satisfaction, usage of information systems and performance. *Information & Management*, 34, 11–18. [https://doi.org/10.1016/S0378-7206\(98\)00044-5](https://doi.org/10.1016/S0378-7206(98)00044-5)
- Goodhue, D. (1988). I/S attitudes: Toward theoretical and definitional clarity. *ACM SIGMIS Database*, 19(3–4), 6–15. <https://doi.org/10.1145/65766.65768>
- Grajek, S. (2018, January 29). *Top 10 IT issues, 2018: The remaking of higher education*. <https://er.educause.edu/articles/2018/1/top-10-it-issues-2018-the-remaking-of-higher-education>
- Gupta, S., & Bostrom, R. P. (2019). A Revision of Computer Self-Efficacy Conceptualizations in Information Systems. *ACM SIGMIS Database: The DATABASE for Advances in Information Systems*, 50(2), 71–93. <https://doi.org/10.1145/3330472.3330478>
- Haab, M. (2007). *Relationship between modes of participation and satisfaction with implementation of enterprise resource planning systems in higher education* [Doctoral dissertation, University of South Alabama]. ProQuest Dissertations Publishing. <https://search.proquest.com/docview/304767193>
- Hennink, M., & Kaiser, B. (2020). Saturation in Qualitative Research. In P. Atkinson, S. Delamont, A. Cernat, J. Sakshaug, & R. Williams (Eds.), *SAGE Research Methods Foundations*. SAGE Publications Ltd. <https://doi.org/10.4135/9781526421036822322>
- Hirschauer, N., Grüner, S., Mußhoff, O., Becker, C., & Jantsch, A. (2020). Can p-values be meaningfully interpreted without random sampling? *Statistics Surveys*, 14(none), 71–91. <https://doi.org/10.1214/20-SS129>
- Hollenbeck, J. R., & Brief, A. P. (1987). The effects of individual differences and goal origin on goal setting and performance. *Organizational Behavior and Human Decision Processes*, 40(3), 392–414. [https://doi.org/10.1016/0749-5978\(87\)90023-9](https://doi.org/10.1016/0749-5978(87)90023-9)
- Igbaria, M., & Tan, M. (1997). The consequences of information technology acceptance on subsequent individual performance. *Information & Management*, 32(3), 113–121. [https://doi.org/10.1016/S0378-7206\(97\)00006-2](https://doi.org/10.1016/S0378-7206(97)00006-2)
- IMS Global Learning Consortium. (2008, November 21). *IMS Global Learning Consortium invites North American higher education institutions to participate in the annual learning technology satisfaction and trends survey (LearnSAT)*. <https://www.imsglobal.org/pressreleases/pr112108.html>
- Integrated Postsecondary Education Data System. (n.d.). *Collecting race and ethnicity data from students and staff using the new categories*. National Center for Education Statistics. Retrieved March 14, 2021, from <https://nces.ed.gov/ipeds/report-your-data/race-ethnicity-collecting-data-for-reporting-purposes>

- Ives, B., Olson, M. H., & Baroudi, J. J. (1983). The measurement of user information satisfaction. *Communications of the Association of Computing Machinery*, 26(10), 785–793. <https://doi.org/10.1145/358413.358430>
- Kositanurit, B., Ngwenyama, O., & Osei-Bryson, K.-M. (2006). An exploration of factors that impact individual performance in an ERP environment: An analysis using multiple analytical techniques. *European Journal of Information Systems*, 15(6), 556–568. <https://doi.org/10.1057/palgrave.ejis.3000654>
- Kulas, J. T., & Stachowski, A. A. (2009). Middle category endorsement in odd-numbered Likert response scales: Associated item characteristics, cognitive demands, and preferred meanings. *Journal of Research in Personality*, 43(3), 489–493. <https://doi.org/10.1016/j.jrp.2008.12.005>
- Kvavik, R. B., Katz, R. N., Beecher, K., Caruso, J., King, P., Voloudakis, J., & Williams, L.-A. (2002). *The promise and performance of enterprise systems for higher education*. <http://web.archive.org/web/20140807230649/https://net.educause.edu/ir/library/pdf/ERS0204/rs/ers0204w.pdf>
- Lang, L., & Pirani, J. A. (2016). *Student information systems: 2015 enterprise application market higher education report*. <https://library.educause.edu/resources/2017/3/student-information-systems-2015-enterprise-application-market-higher-education-report>
- Lincecum, L. (2000). *The effects of software disruption on goal commitment, task self-efficacy, computer self-efficacy, and test performance in a computer-based instructional task*. [Doctoral dissertation, Texas Tech University].
- Mell, P., & Grance, T. (2011). *The NIST definition of cloud computing* (NIST Special Publication No. 800–145; Computer Security, p. 7). National Institute of Standards and Technology.
- Melone, N. P. (1990). A theoretical assessment of the user-satisfaction construct in information systems research. *Management Science*, 36(1), 76–91. <https://doi.org/10.1287/mnsc.36.1.76>
- Mitakos, T., Almaliotis, I., & Demerouti, A. (2010). An Auditing Approach for ERP Systems Examining Human Factors that Influence ERP User Satisfaction. *Informatica Economica*, 78–92.
- Mullany, M. J. (2002). The meaning and measure of user satisfaction, and its relationship to the analyst-user cognitive style differential. *Proceedings of the 15th Annual NACCHQ*, 73–80.
- Mullany, M. J., Tan, F. B., & Gallupe, R. B. (2006). The S-Statistic: A measure of user satisfaction based on Herzberg's theory of motivation. *ACIS 2006 Proceedings*, 86.
- Nolan, R. L., & Seward, H. (1974). Measuring user satisfaction to evaluate information systems. *Managing the Data Resource Function*, 253–275.

- Norris, D., Baer, L., Leonard, J., Pugliese, L., & Lefrere, P. (2008). *Action analytics: Measuring and improving performance that matters in higher education*. 13.
- Olugbara, O. O., Kalema, B. M., & Kekwaletswe, R. M. (2014). *Identifying critical success factors: The case of ERP systems in higher education*. <https://openscholar.dut.ac.za/handle/10321/1136>
- Pearson, S. W., & Bailey, J. E. (1980). Measurement of computer user satisfaction. *SIGMETRICS Perform. Eval. Rev.*, 9(1), 59–68. <https://doi.org/10.1145/1041872.1041881>
- Peechapol, C., Na-Songkhla, J., Sujiva, S., & Luangsodsai, A. (2018). An Exploration of Factors Influencing Self-Efficacy in Online Learning: A Systematic Review. *International Journal of Emerging Technologies in Learning (IJET)*, 13(09), 64–86.
- Ragu-Nathan, T. S., Tarafdar, M., Ragu-Nathan, B. S., & Tu, Q. (2008). The consequences of technostress for end users in organizations. *Information Systems Research*, 19(4), 417–433.
- Ruffalo Noel Levitz, NRCCUA, OmniUpdate, & CollegeWeekLive. (2017). *2017 e-expectations trend report*. Ruffalo Noel Levitz. http://learn.ruffalonl.com/rs/395-EOG-977/images/RNL_2017_E_Expectations%20report_1.0.pdf
- Scholtz, B., Calitz, A., & Cilliers, C. (2013). *Usability evaluation of a medium-sized ERP system in higher education*. 16(2), 14.
- Sethi, V., & King, R. C. (1998). An application of the cusp catastrophe model to user information satisfaction. *Information & Management*, 34, 41–53. [https://doi.org/10.1016/s0378-7206\(98\)00039-1](https://doi.org/10.1016/s0378-7206(98)00039-1)
- Straub, D., & Burton-Jones, A. (2007). Veni, vidi, vici: Breaking the TAM logjam. *Journal of the Association for Information Systems*, 8(4), 5.
- Suhy, A. (2010). *An examination of the relationships between organizational factors and information technology satisfaction and use: A study of undergraduate faculty* [PhD Thesis, University of Michigan]. https://deepblue.lib.umich.edu/bitstream/handle/2027.42/78740/asuhy_1.pdf?sequence=1&isAllowed=y
- Venkatesh, Morris, Davis, & Davis. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 27(3), 425. <https://doi.org/10.2307/30036540>
- Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management Science*, 46(2), 186–204. <https://doi.org/10.1287/mnsc.46.2.186.11926>

Wixom, B. H., & Todd, P. A. (2005). A theoretical integration of user satisfaction and technology acceptance. *Information Systems Research*, 16(1), 85–102. <https://doi.org/10.1287/isre.1050.0042>

Zmud, R. W. (1979). Individual differences and MIS success: A review of the empirical literature. *Management Science*, 25(10), 966–979. <https://doi.org/10.1287/mnsc.25.10.966>

APPENDIX A: QUESTIONNAIRE

Please tell us a little about your institution.

Please indicate which of the ranges below best reflects the number of full-time equivalent students enrolled at your institution. If your campus is part of a multi-campus district, please answer based on the enrollment of the entire district. *

Choose one of the following answers
Please choose **only one** of the following:

- 0 - 499 students
- 500 - 1,999 students
- 2,000 - 4,999 students
- 5,000 - 9,999 students
- 10,000 or more students

Please indicate whether your institution is in an urban, suburban, or rural setting. *

Choose one of the following answers
Please choose **only one** of the following:

- Urban
- Suburban
- Rural

Is your institution a part of a multi-campus district? *

Please choose **only one** of the following:

- Yes
- No

Comfort Level with Student Information System

Answers to these questions will be used to gauge your comfort level with using your institution's student information system. Please indicate whether you agree or disagree with each of the following statements by answering "yes" or "no."

Please indicate the degree to which you agree or disagree with the following statements. *

Please choose the appropriate response for each item:

| | strongly disagree | disagree | neither agree nor disagree | agree | strongly agree |
|--|--------------------------|-----------------|-----------------------------------|--------------|-----------------------|
| I have mastered the use of my institution's student information system. | | | | | |

| | strongly disagree | disagree | neither agree nor disagree | agree | strongly agree |
|--|----------------------|----------|-------------------------------|-------|-------------------|
| I do not perform as well in our institutions student information system as I would like. | | | | | |
| I am certain I can use my institution's student information system well. | | | | | |
| It is just not possible for me to use my institution's student information system at the level I would like. | | | | | |
| I think my performance with my institution's student information system could be improved substantially. | | | | | |

Student Information Satisfaction

Answers to these questions will help determine your satisfaction with your institution's Student Information System.

Please answer the following questions using the scale provided. *

Please choose the appropriate response for each item:

| | almost never | some of the time | about half the time | most of the time | almost always |
|---|--------------|---------------------|------------------------|---------------------|------------------|
| Does the system provide the precise information you need? | | | | | |
| Does the information content meet your needs? | | | | | |
| Does the system provide reports that seem to be just about exactly what you need? | | | | | |
| Does the system provide sufficient information? | | | | | |
| Do you find the output relevant? | | | | | |
| Is the system accurate? | | | | | |
| Are you satisfied with the accuracy of the system? | | | | | |
| Do you feel the output is reliable? | | | | | |
| Do you find the system dependable? | | | | | |
| Do you think the output is presented in a useful format? | | | | | |

| | almost never | some of the time | about half the time | most of the time | almost always |
|---|--------------|------------------|---------------------|------------------|---------------|
| Is the information clear? | | | | | |
| Are you happy with the layout of the output? | | | | | |
| Is the output easy to understand? | | | | | |
| Is the system user friendly? | | | | | |
| Is the system easy to use? | | | | | |
| Is the system efficient? | | | | | |
| Do you get the information you need in time? | | | | | |
| Does the system provide up-to-date information? | | | | | |

Please choose the appropriate response for each item:

| | strongly disagree | disagree | neither agree nor disagree | agree | strongly agree |
|---|-------------------|----------|----------------------------|-------|----------------|
| Overall, using the student information system is a pleasant experience. | | | | | |
| I plan to increase my use of the student information system over the next year. | | | | | |
| Using the student information system enhances my effectiveness on the job. | | | | | |

Other Factors

Is your institution's student information system from the same vendor as your institution's Human Resources and/or Financial systems? *

Choose one of the following answers
Please choose **only one** of the following:

- Yes
- No
- Don't know

Please indicate how long your institution's current student information system has been in place. *

Choose one of the following answers

Please choose **only one** of the following:

- Less than 1 year
- 1 - 4 years
- 5 - 9 years
- 10 - 19 years
- 20 years or more
- Don't know

Please select the best description of how your institution runs its student information system or select "don't know." If you select "other," please elaborate in the comment box. *

Choose one of the following answers

Please choose **only one** of the following:

- The student information system is run on-campus by our technology staff.
- The student information system is off-campus but run by our technology staff.
- The student information system is run by the vendor and is off-campus.
- Other (please elaborate in comment)
- Don't know

Make a comment on your choice here:

Is your institution considering or implementing a project to change the student information system? *

Choose one of the following answers

Please choose **only one** of the following:

- Not considering a replacement.
- Examining options for replacement.
- In the process of a replacement project.
- Don't know.

Please provide some information about yourself.

This information will be used for classification and will not be used to connect responses to individuals.

Did you use a different student information system prior to using the one you use now? *

Please choose **only one** of the following:

- Yes
- No

How many years have you worked in higher education? *

Choose one of the following answers

Please choose **only one** of the following:

- 4 or less
- 5 to 9
- 10 to 14
- 15 to 19
- 20 or more

Do you have professional work experience outside of higher education? *

Please choose **only one** of the following:

- Yes
- No

Please choose the functional area that best fits your work. If there is more than one, please choose the one in which you are most focused. *

Choose one of the following answers

Please choose **only one** of the following:

- Admissions/Student Recruiting/Enrollment Management
- Academic Affairs/Provost
- Academic Advising/Counseling
- Alumni/Development
- Adult/Continuing Education
- Faculty
- Facilities
- Finance and Administration/Controller
- Financial Aid/Scholarships
- High School-College Programs
- Human Resources
- Institutional Research
- Information Technology
- Orientation
- Police/Safety
- Registrar/Student Records

- Student Life/Conduct/Activities
- Testing
- Other Academic
- Other Administration or Finance
- Other Student Affairs
- Prefer not to say.

Please specify your ethnicity. *

Check all that apply

Please choose **all** that apply:

- White
- Hispanic, Latino, or Spanish origin
- Black or African American
- Asian
- American Indian or Alaskan Native
- Middle Eastern or North African
- Native Hawaiian or Other Pacific Islander
- Some other race, ethnicity, or origin
- Prefer not to say.

Please indicate the choice below that best describes your employment status. *

Choose one of the following answers

Please choose **only one** of the following:

- Full-Time
- Part-Time
- Prefer not to say.

What is your current gender identity? *

Check all that apply

Please choose **all** that apply:

- Female
- Male
- Genderqueer/gender non-conforming
- Other not listed here
- Prefer not to say.

Please select the classification that describes your primary appointment at your institution. *

Choose one of the following answers

Please choose **only one** of the following:

- Staff: Hourly or Classified
- Staff: Salaried
- Faculty: Other
- Faculty: Tenure Track
- Student Worker
- Other
- Prefer not to say.

Please indicate your age group. *

Choose one of the following answers

Please choose **only one** of the following:

- Under 25 years old
- 25 to 34 years old
- 35 to 44 years old
- 45 to 54 years old
- 55 to 64 years old
- 65 years or older
- Prefer not to say.

Feedback

Thank you for taking the time to complete this survey. If you have any comments regarding your satisfaction with your institution's student information system, please add them here.

Please write your answer here:

APPENDIX B: IRB APPROVAL LETTER



FERRIS STATE UNIVERSITY

INSTITUTIONAL REVIEW BOARD FOR HUMAN SUBJECT RESEARCH

1010 Campus Drive FLITE 410 Big Rapids, MI 49307 | (231) 591-2553 | www.ferris.edu/irb

Date: March 24, 2020

To: Susan DeCamillis, Ed.D., Michael Passer

From: Gregory Wellman, R.Ph, Ph.D, IRB Chair

Re: IRB Application *IRB-FY19-20-150 Factors influencing administrative user satisfaction with student information systems in community colleges*

The Ferris State University Institutional Review Board (IRB) has reviewed your application for using human subjects in the study, *Factors influencing administrative user satisfaction with student information systems in community colleges (IRB-FY19-20-150)* and approved this project under Federal Regulations Exempt Category 2.(ii). Research that only includes interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording).

Any disclosure of the human subjects' responses outside the research would not reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, educational advancement, or reputation.

Your protocol has been assigned project number IRB-FY19-20-150. Approval mandates that you follow all University policy and procedures, in addition to applicable governmental regulations. Approval applies only to the activities described in the protocol submission; should revisions need to be made, all materials must be approved by the IRB prior to initiation. In addition, the IRB must be made aware of any serious and unexpected and/or unanticipated adverse events as well as complaints and non-compliance issues.

This project has been granted a waiver of consent documentation; signatures of participants need not be collected. Although not documented, informed consent is a process beginning with a description of the study and participant rights, with the assurance of participant understanding. Informed consent must be provided, even when documentation is waived, and continue throughout the study.

As mandated by Title 45 Code of Federal Regulations, Part 46 (45 CFR 46) the IRB requires submission of annual status reports during the life of the research project and a Final Report Form upon study completion. Thank you for your compliance with these guidelines and best wishes for a successful research endeavor. Please let us know if the IRB can be of any future assistance.

Regards,

A handwritten signature in black ink, appearing to read 'Gregory Wellman'.

Gregory Wellman, R.Ph, Ph.D, IRB Chair

Ferris State University Institutional Review Board