INCREASING TECHNOLOGY ACCEPTANCE IN CALIFORNIA COMMUNITY COLLEGES: EXTENDING THE TECHNOLOGY ACCEPTANCE MODEL FOR STUDENT SERVICES PROFESSIONALS

A Thesis

Presented to the faculty of Graduate and Professional Studies in Education

California State University, Sacramento

Submitted in partial satisfaction of the requirements for the degree of

MASTER OF ARTS

in

Education

(Higher Education Leadership)

by

Kevin Michael Flash

SPRING
2014
INCREASING TECHNOLOGY ACCEPTANCE IN CALIFORNIA COMMUNITY COLLEGES: EXTENDING THE TECHNOLOGY ACCEPTANCE MODEL FOR STUDENT SERVICES PROFESSIONALS

A Thesis

by

Kevin Michael Flash

Approved by:

__________________________________, Committee Chair
Geni Cowan, Ph.D.

__________________________________, Second Reader
Victoria C. Rosario, Ed.D.

Date

iii
Student: Kevin Michael Flash

I certify that this student has met the requirements for format contained in the University format manual, and that this thesis is suitable for shelving in the Library and credit is to be awarded for the thesis.

________________________, Department Chair
Susan Heredia, Ph.D.                     ___________________________
Date

Graduate and Professional Studies in Education
Abstract

of

INCREASING TECHNOLOGY ACCEPTANCE IN CALIFORNIA COMMUNITY COLLEGES: EXTENDING THE TECHNOLOGY ACCEPTANCE MODEL FOR STUDENT SERVICES PROFESSIONALS

by

Kevin Michael Flash

Statement of Problem

The purpose of this study was to identify factors that influence the rate of acceptance of technology by student services professionals in California Community Colleges. The theoretical framework is based on the Technology Acceptance Model that identified perceived usefulness and perceived ease of use as predictors of technology acceptance. The study also explored the extension of subjective norm, and three facilitating conditions of inclusion in system selection, training, and system support. The study was conducted in a background of theory of student services and the increasing role of technology used in delivering services to students.

Sources of Data

The quantitative study consisting of 19 Likert-scale survey items was used to gather responses and analyze data from 246 individuals who subscribe to listservs maintained for communication with student services staff and administrators in California Community Colleges.
Conclusions Reached

Perceived usefulness and perceived ease of use were valid constructs in the California Community College environment, and that inclusion in the system selection process, the availability of training and professional development, and having system support available, are facilitating conditions influencing technology acceptance. Student services professionals in California Community Colleges believe that technology can be used to deliver many of the services supporting student success, and that many of these services will soon be offered through technology at their college.

The beneficiaries of this study are college administrators responsible for student services and those responsible for the allocation of resources to support such efforts, information technology professionals responsible for the development or selection of technology systems, and the student services professionals who adopt technology systems for their own use and for use by students.

________________________, Committee Chair
Geni Cowan, Ph.D.

________________________
Date
DEDICATION

I dedicate this thesis to my children, Jessica, Joshua, Sarah and Hannah. Know that whatever you want to do, and whoever you wish to be, education holds the key.
ACKNOWLEDGMENTS

First, I would like to thank Dr. Victoria Rosario, for her consistent guidance and encouragement. Thanks for agreeing to be my second reader and for the support and guidance throughout my studies.

My special thanks goes to Hermia Kho, my wonderful better half, whose quiet support and wonderful dinners through the last couple years has helped me complete this journey.

I would like to thank Ms. Betty Culver-Gyer, whose love of research and insight into creating surveys produced many suggestions that were beneficial to my study.

I would also like to thank Dr. Stephen Boyd, whose words of advice and personal point of view as I began the program helped guide my decisions and my perspective through the course of my studies.

Thanks to my classmates, whose camaraderie provided much encouragement, clarification and reflection and whose friendship has enriched my world.

Lastly thanks to Dr. Geni Cowan and Dr. José Chávez for all the guidance, insight, perspective and wisdom which you provided throughout the program.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dedication .......... vii</td>
</tr>
<tr>
<td>Acknowledgments .... viii</td>
</tr>
<tr>
<td>List of Tables .......... xi</td>
</tr>
</tbody>
</table>

**Chapter**

1. **INTRODUCTION** ................................................................. 1
   - Background ........................................................................ 1
   - Statement of the Problem .................................................. 3
   - Definition of Terms ......................................................... 3
   - Limitations of the Study ................................................... 6
   - Significance of the Study .................................................. 6
   - Organization of the Remainder of the Study .......................... 9

2. **LITERATURE REVIEW** .......................................................... 10
   - Introduction ......................................................................... 10
   - Student Services and Student Services Personnel .................. 12
   - Technology and Student Services ....................................... 21
   - Technology Acceptance Models ......................................... 28

3. **METHODOLOGY** ................................................................. 39
   - Introduction ......................................................................... 39
   - Setting of the Study ........................................................... 39
   - Population and Sample ..................................................... 40
   - Design of the Study ............................................................ 43

4. **RESULTS AND DATA ANALYSIS** .......................................... 47
   - Introduction ......................................................................... 47
   - Presentation of the Data ..................................................... 48
   - Summary of Findings ......................................................... 72
<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Demographics</td>
</tr>
<tr>
<td>2.</td>
<td>Usefulness of Technology for Providing Services to Students</td>
</tr>
<tr>
<td>3.</td>
<td>Usefulness of Technology for Accomplishing Tasks Quickly</td>
</tr>
<tr>
<td>4.</td>
<td>Usefulness of Technology for Increasing Efficiency of Time with Students</td>
</tr>
<tr>
<td>5.</td>
<td>Usefulness of Technology for Increasing Quality of Work</td>
</tr>
<tr>
<td>6.</td>
<td>Perceived Ease of Use of New Technologies in General</td>
</tr>
<tr>
<td>7.</td>
<td>Perceived Ease of Use at New Technologies in Student Services</td>
</tr>
<tr>
<td>8.</td>
<td>Perceived Ease of Use of the Student Services System</td>
</tr>
<tr>
<td>9.</td>
<td>Departmental Participation in the Decision-Making Process</td>
</tr>
<tr>
<td>10.</td>
<td>Individual Participation in the Decision-Making Process</td>
</tr>
<tr>
<td>11.</td>
<td>Provided Feedback During Technology Development</td>
</tr>
<tr>
<td>12.</td>
<td>Availability of Training in the Form of Specialized Instruction</td>
</tr>
<tr>
<td>13.</td>
<td>Support from Individuals or Groups when Encountering Difficulties</td>
</tr>
<tr>
<td>14.</td>
<td>Support of Administrators for the Use of Student Services Technology</td>
</tr>
<tr>
<td>15.</td>
<td>Support of the College Community for the Use of Student Services Technology</td>
</tr>
<tr>
<td>16.</td>
<td>Perception that Managers Expected the Use of Student Services Technology</td>
</tr>
<tr>
<td>17.</td>
<td>Respondents’ Perception of Colleagues’ Willingness to Use the System</td>
</tr>
<tr>
<td>18.</td>
<td>Willingness to Use the System to Help Interact With Students</td>
</tr>
<tr>
<td>19.</td>
<td>Student Services Which Should be Offered Through Technology</td>
</tr>
<tr>
<td>20.</td>
<td>Services Currently Delivered Using Technology</td>
</tr>
</tbody>
</table>
Chapter 1

INTRODUCTION

Background

The California Community College system, as one of the three major systems of public higher education in the state of California, is under increasingly greater pressure from the states legislature and the public to increase the success rate of students in the state. After years of discussion and debate the legislature passed the Student Success Act of 2012, which outlines these expectations, particularly as they relate to the support services which students receive as they seek their educational goals of vocational certification, associate degrees, and transfer readiness to four year institutions. The legislation outlines incentives provided to students who seek and receive specific services which support their success in higher education, in particular orientation, assessment, counseling and student education plans. Since the numbers of students who will benefit from these services greatly outnumber the student services professionals who can provide them, the community college system is seeking to employ technology solutions which will assist in providing these services.

The research on the use of technology to deliver student services lags significantly behind that of research for technology used in instruction. Student services professionals have been instrumental in providing these services individually to students for decades, and their intention to use and support technologies for student services will be influential
in the rate at which technologies can be deployed for these purposes in the state. An understanding of factors which influence user acceptance of technology will play an important role as community college administrators and staff seek to leverage technologies in support of student services that facilitate student success.

In an effort to identify early in a system development effort the factors which would predict the acceptance of software by users, Davis (1989) identified two variables, Perceived Usefulness (PU) and Perceived Ease of Use (PEU), which became foundational predictors in the Technology Acceptance Model (TAM). Having its roots in the Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975), this framework provides measures that predict acceptance of a system without waiting for development and deployment in order to assess system usage. This approach reduces the waste of financial and human resources due to deploying systems which users resist accepting or refuse to use. The TAM framework has been extended in TAM2 (Venkatesh & Davis, 2000) and TAM3 (Venkatesh & Bala, 2008) to include other predictors, such as social influences including subjective norm, that influence the PU and PEU predictors. In addition, facilitating conditions have been researched including the involvement of users in system selection and development, training and professional development during deployment, and system support after implementation. The TAM and subsequent extensions have been heavily researched in a number of settings, with the basic framework being strongly supported. The influence of additional predictors and facilitating conditions examined in extended models vary based upon the environment.
This study explores the validity of an extended TAM framework in a community college environment and researches the predictors and facilitating conditions included in previous research.

**Statement of the Problem**

In order to increase the rate of acceptance of technology for the delivery of student services by student services professionals in California’s community colleges, administrators at the colleges in the California Community College system need to identify the key predictors and facilitating conditions of an extended Technology Acceptance Model (TAM) framework to be used in the selection, development and implementation of technologies for these services at their colleges.

**Definition of Terms**

Facilitating Conditions

Activities and conditions that facilitate the acceptance of technology. Three facilitating conditions in this study are user inclusion in the system selection and development process, training and professional development, and support when encountering system difficulties.
Listserv

An electronic mailing list software application that allows an individual to send one email to the list, and then transparently sends it on to the email addresses of all the subscribers to the list.

Matriculation

The process of becoming a member of a college or university. In California Community Colleges, this includes the activities of orientation, assessment, and educational planning.

Perceived Ease of Use (PEU)

One of the major predictive variables used in the Technology Acceptance Model which captures a user’s belief that software will be easy to use once it is developed.

Perceived Usefulness (PU)

One of the major predictive variables used in the Technology Acceptance Model which captures a user’s belief that a system will be beneficial to them in carrying out their work assignments.

Social Influence (SI)

The influence that other individuals have on an individual’s opinion or behavior.

Student Services

A wide array of services in the California community colleges that support a student’s emotional, cultural, and social development outside the classroom.
Subjective Norm (SN)

An additional predictor in extended technology acceptance models which captures the influence that other people who are important to an individual has on their intention to use technology.

Technology Acceptance Model (TAM)

A model based on the Theory of Reason Action (TRA) used to predict during the early stages of system design if a technology will be used by individuals once it is developed and deployed.

Theory of Planned Behavior (TPB)

An extension of the Theory of Reasoned Action, that added the concept of perceived behavioral control, or the confidence that one has the resources and ability to successfully carry out an action, to the constructs of attitude and social norm in predicting behavioral intention.

Theory of Reasoned Action (TRA)

A model for the prediction of behavioral intention, represented as \( BI = A + SN \), stating the intention perform a behavior (BI) depends upon an individual’s attitude (A) about the behavior and subjective norms (SN).

Universal Theory on the Acceptance and Use of Technology (UTAUT)

A model that sought to incorporate many theories on technology acceptance into a single unified framework.
**Limitations of the Study**

This study is intended to measure the perception of community college staff on the usefulness of technologies for student support, and is not intended to capture the perspective or value which students place on technology for the delivery of student services. The survey was distributed to individuals who subscribe to listservs maintained by the California Community College Chancellors Office. The individuals who subscribe to listservs may be more favorable toward the use of technology; those who may be less technology savvy may not be equitably represented in this study. The survey did not identify the institution to which a respondent belonged, as a result the study was limited to perceptions of individuals, and could not be used to determine if institutional practices influence the perceptions of groups of individuals at a specific institution.

**Significance of the Study**

Currently the number of student services professionals at California’s community colleges are not adequate to provide individually all the services required by a large student population to support their success. These same student services professionals are resistant to adopting technologies which they do not perceive as useful, and the state of California cannot afford to fund the creation of technologies which are not used. If the colleges in the California Community College system do not adopt a technology acceptance model suited to the characteristics of its student services professionals, the investment in new student services technologies will be wasted as system acceptance will
be resisted, system usage will be underutilized, students will continue to go underserved, and student success rates will fail to meet their potential. The significance of this study is that by identifying key predictors and facilitating conditions of a TAM framework the rate of technology acceptance by student services professionals will increase and the use of technology for delivering student services will expand and student success actualized.

The landscape of higher education is changing, with the use of technology expanding its footprint from administrative systems into the instructional domain with online degrees, online and hybrid classes, and other technologies being regularly deployed for instructional purposes. This expansion is continuing beyond the administrative and instruction domains and is currently pressing at an accelerated rate into student service delivery. The State of California in its 2013-2014 budget (State of California, 2013) increased the allocation of funds to the California Community Colleges for technology, and the California Community College Chancellors Office approved funding for the Educational Planning Initiative to the amount of $30 million (Butte Community College, 2013), more than doubling any previous year’s allocation. Moreover, $50 million dollars were allocated for the Student Success and Support Program, an initiative that requires colleges to develop front-end matriculation services, which are delivered through the use of technology, in order to improve outcomes for all students (State of California, 2013). Providing funding for student services technology is an important step, but funding alone does not guarantee the acceptance of these systems and their adoption for use by student services professionals.
Davis (1989) in the Technology Acceptance (TAM) framework identified two constructs, perceived usefulness (PU) and perceived ease of use (PEU), which he showed directly influence an individual’s intention to use technology. Subsequent research has affirmed the significance of these two constructs, and also expanded the model with other factors to provide additional information in predicting the intention for technology acceptance in the early stages of software development. The objective of the TAM and subsequent extensions is to increase the rate at which technology systems, once deployed to a user community, would be accepted and used, and reduce the investment in technologies that encounter resistance and non-acceptance when deployed.

The purpose of this study is to research if the TAM framework, with the extension of Subjective Norm (SN), and the inclusion of three facilitating conditions, inclusion in system selection and development, training and professional development, and system support, can positively influence the intention to use new technologies for the delivery of student services by student services professionals in California Community Colleges. If the study confirms this model it can be used as a framework by administrators for guiding technology initiatives for student services at their college and for allocating resources to support their development and implementation. The objective of this study is to investigate and answer the following research questions:

1. What are the primary factors which influence the willingness of student services personnel at community colleges in California to adopt new technologies for the delivery of services to students?
2. Of the various student services required as part of matriculation, which of these services do student services personnel believe can be offered through a technology enabled solution?

3. Of the various student services required as part of matriculation, which of these services are currently being delivered through technology at community colleges in California?

Organization of the Remainder of the Study

The literature review that follows will examine the following:

1. Theories supporting student services and the role of student services professionals in delivering services.

2. Technology adoption in student services and the current environment for technology in higher education in California.

3. Technology acceptance models which provide frameworks that facilitate the adoption and use of technologies, and their potential for applicable use in the development and deployment of student service technologies.

This will be followed by a chapter describing the methodology used for the study, including its setting, population, and design. An analysis of the data will be presented, and the study concludes with recommendations for future practices and research.
Introduction

Student services personnel have played an important role in higher education since early in the 20th century (Hamrick, Evans, & Schuh, 2002). Student services personnel, in their role as scholar-practitioners, must possess, among many other skill sets, an ability to understand theories of student development (Astin, 1993; Brown, 1972; Chickering & Reisser, 1993) and apply them in the services they provide to students. Given that there are 2.4 million students attending 112 community colleges in the State of California (California Community Colleges Chancellor’s Office, 2014), the number of students requiring services far exceeds the available number of student services personnel available to deliver them. In a 2012 report, the California Academic Senate for California Community Colleges stated the following:

It was not until the Academic Senate adopted the Consultation Task Force Report on Counseling (2003) that attention was paid to how very little the system had been investing in student support services since the passage of the Matriculation Act in 1986 and AB 1725 in 1988. The report highlights survey results indicating an actual counselor-to-student ratio of 1:1918 in contrast to the recommended ratio of 1:900 which the task force calculated using the Title 5 §58732 formula. 

(p. 3)
The ratio of 1:900 mentioned in the report as a recommended target for California colleges is far below the recommended ratio of 1:300 that the National Academic Advising Association (NACADA) recommends for academic counselors; based on NACADA 2011 National Survey of Academic Advising (as cited in Robbins, 2013), the median case load of advisees per full-time professional academic advisor is 296, or a ratio of 296 students to one full-time advisor. By institutional size, the median individual advisor case loads are 233, 333, and 600 advisees for small, medium, and large institutions, respectively (Robbins, 2013). A result of the actual ratios falling far below recommended ratios is an increased expectation that technology be used to leverage the ability of a limited number of student services personnel and provide services to students which historically have been delivered individually and in person (The Student Success Act, 2012). The literature provides evidence that technology has been increasingly used over the last decade for instructional purposes as well as to provide improved services for admissions application and class registration (Shier, 2005). The ability to successfully expand into other areas of students services depends, in part, on the rate at which student services personnel accept newly developed technologies. While the creation of technology solutions does not always assure their acceptance and adoption, the Technology Acceptance Model posited by Davis (1989) provides a framework to predict higher acceptance of technologies when they are implemented. Student development and technology acceptance theories provide the framework for exploring the expansion of
technology for student services which may have a higher rate of acceptance by student services professionals.

**Organization of the Literature Review**

The literature review presents a framework for the acceptance of technology by student services personnel in the delivery of services to students in higher educational institutions. The literature review is comprised of three sections: (a) theories supporting student services and student development; (b) a review of literature on technology adoption in higher education and student services; and (c) theories on technology acceptance. The theoretical perspectives used in this study are viewed through a lens of student success based on the provisioning of student services through technology, and theories of technology acceptance based upon user acceptance of technology models.

**Student Services and Student Services Personnel**

Student services and the role of student services personnel in delivering them are critical to the success of the student (Kuh, Kinzie, Schuh, & Whitt, 2010). This section is presented in four parts: (a) the foundations of the profession; (b) theoretical structures including theories on student growth and development; (c) holistic institutions; and (d) retention (American Council on Education [ACE], 1937; Astin, 1993; Blair, 1998; Brofenbrenner, 2005; Brown, 1972; Chickering & Reisser, 1993; Evans, 2010; Hamrick, 2002; Komives, 1998; Kuh, 1996; McClellan & Stringer, 2009; Nuss, 2003; Tinto, 2006). This background will provide a context for the use of technology as an emerging trend to
provide comprehensive support services to facilitate student success which have historically been provided by student services professionals using non-technical means.

**Foundations of the Profession**

The need for student services professionals has its roots in the environment of the last half of the nineteenth century (Hamrick et al., 2002). Up until the end of the Civil War, the tradition of American colleges and universities was focused on the student as a whole individual, and the goal of education was to develop the student into their full potential. In the latter half of the 19th century, however, the emphasis shifted from the development of the student to the extension of the boundaries of knowledge. Faculty, for example, became more focused on concerns of acquiring and transmitting subject area knowledge, and neglected the student as an individual (ACE, 1937). According to Nuss (2003), in the early part of the 20th century the development of the modern form of student services began to evolve as faculty focused on subject knowledge and colleges established separate organizations to support students. These organizations focused their practice around vocational guidance, the collection of accurate data on individual students, and supervising the use of inventories on occupational interests (Nuss, 2003).

**Student services professionals.** The origins of the modern day student services professional can be traced back to research conducted by L. B. Hopkins in 1926 under the direction of the American Council on Education (ACE, 1937). These studies resulted in the creation of cumulative records, personality rating scales, and comparable achievement tests, which in turn supported the improvement of student services (ACE, 1937). In the
1937 report *Principles of good practice for student affairs*, ACE formally identified 23 services, in addition to instruction, that were necessary to support an individual student in an educational program. According to ACE (1937), these services included orientation to college, assistance in determining courses based on assessment tests, and assistance with clarifying occupational goals and educational plans in relation to them. Several years later, further delineation was made for the first time to define and delimit personnel activities separate and distinct from other instructional and administrative functions in a manner much clearer than anything previously published (ACE, 1949).

**Student services research.** From its origins the professional practices and standards of student services evolved based on research in the areas of education, psychology and psychiatry (ACE, 1949; McClellan & Stringer, 2009). For student services personnel, the profession is not only about being capable of relating to and interacting with students, but also understanding the underlying research. The role of providing student services is critical to student success. The purpose of student services is to provide support to students that complement academic instruction with the objective of assisting a student in reaching their educational goal. Further, regional accreditation standards for California’s community colleges require that in addition to academic services institutions must also provide non-academic services to students for their development and success (Accrediting Commission for Community and Junior Colleges, 2012). Student success as articulated in the Student Success Act is defined as the ability
for a student to identify their educational goal and achieve it in a timely manner (The Student Success Act, 2012).

The profession requires the ability to both understand research and be data driven, as well as the ability to be effective in relationships with students, and the student services professional is often described in the literature as a scholar-practitioner (Evans, 2010). According to Knefelkamp and Komives (as cited in Evans, Forney, Guido, Patton, & Renn, 2010), theories of student development, engagement, and the creation of holistic environments for students provide the foundation for practicing the profession.

**Student Growth and Development Theory**

Student development theories were developed to describe the growth of students during their college years. Student development theory serves as a backdrop for student services professionals in terms of the services that are put in place to support the whole student. According to Evans et al. (2010), they cover foundational theories of identity development (Erikson, 1980; Marcia, 1966; Josselson, 1987; Chickering, 1969), ethical development (Perry, 1970), moral development (Kohlberg, 1981) and experiential learning (Kolb, 1984). Student development is also based on integrative theories as described by Evans et al. (2010), including Bronfenbrenner’s (2005) developmental ecology model as well as theories on self-authorship (Baxter Magolda, 1999), faith (Fowler, 1981), and Schlossberg’s transition theory (Schlossberg, 1981). A third branch of theories, according to Evans et al. (2010) evolve around the social development of
students, and include theories on racial (Degaldor & Stefancic, 2000), ethnic (Phinney, 1990), sexual (Fassinger, 1998), and gender (Bem, 1981) identity.

In their revised theory on psychosocial development, Chickering and Reisser (1993) described the following seven vectors of student development during their college years:

- Developing purpose
- Developing competence
- Managing emotions
- Moving through autonomy to interdependence
- Developing mature interpersonal relationships
- Establishing identity
- Developing integrity

Two of the seven vectors described in his research, developing purpose and developing competence, were selected as a focus in this literature review because they can be linked to student service activities related to matriculation, such as career exploration, that are mentioned in the Student Success Act of 2012 (The Student Success Act, 2012). Developing purpose and developing competence are directly tied to two required services of the Student Success Act: assessment and educational planning.

**Purpose.** Developing purpose is one of the key elements to student development described by Chickering and Reisser (1993). Many students come to college with energy, and enthusiasm but only have vague, unrefined notions of who they want to
become. Student services professionals should assist students in moving beyond the perception that they are attending college to qualify them for a good job to one which helps them build skills for a wide range of life experiences; and from a place where they view college as the means to achieve a comfortable living to one where they can develop a broad knowledge base, a broad world-view and philosophy, and become lifelong learners (Evans, 2010). From initial contact the student services professionals must be aware that they are responsible for guiding students through a journey where they develop a purpose for their life (Chickering & Reisser, 1993).

**Competence.** The development of competence is also important (Chickering & Reisser, 1993), and student services professionals can facilitate its development through the design of the processes they build in delivering student services. The completion of the admissions application or any of the matriculation services; orientation to college, planning courses based on assessment tests, clarifying occupational goals and educational plans in relation to them can provide the student with a sense of accomplishment (ACE, 1937). By assisting students with these initial services student services personnel can help create a sense of confidence within the student that they are capable of navigating the higher educational system which is new and foreign to them. Student services is not just about student growth based upon theories of developing the whole student (Baxter Magolda, 1999; Chickering & Reisser, 1993; Erikson, 1968; Perry, 1970), but also about creating holistic environments, institutions where students find an integrated ecological
system supporting them academically and socially (Blair, 1998; Brown, 1972; Brofenbrenner & Morris, 2010).

**Holistic Institutions**

According to Blair (1998), institutions must provide seamless integration of their student services and academic branches in order to achieve development of the whole student. This requires the creation of a total learning environment, not just the completion of instructional curriculum (Blair, 1998). As stated in Brown (1972) and in Evans et al. (2010), the work of student services professionals is to extend the in-classroom subject area experience of students into other areas, influencing affective development as well as cognitive development and creating an environment for the holistic development of students.

In his work *Student Development in Tomorrow’s Higher Education: A Return to the Academy*, Brown (1972) stated that student services personnel address multiple facets of a student’s growth, expanding beyond the acquisition of knowledge and examining the interaction between the student and their environment. Student services personnel seek to extend the learning environment to address process as well as content, affective development as well as cognitive development, and competency attainment as well as knowledge learned (Brown, 1972). Their goal is to achieve the holistic development of a student.

Two promising avenues to affect student development are the interaction a student has with their peer-group, and the interaction they have with their instructional
faculty. By developing services which create an environment that facilities interactions with these groups student services personnel generate a sense of community that is critical to student development (Astin, 1993; Brown, 1972). Student services professionals are critical to the success and persistence of community college students. According to Hardgrave and Johnson (2003) and Ender, Chand, and Thornton (1996), building a sense of community is a critical factor in student success. According to Hornak, Akweks, and Jeffs (2010), the role of student services personnel is to assist students in building and maintaining relationships with the college, which according to Astin (1993) facilitates student achievement and academic success.

Research suggests that student services professionals can create lifelong learning opportunities inside and outside the classroom (Kuh, 1996) and also produce a seamless system of education, including schools, training institutions, emerging technologies and distance learning techniques (Blair, 1998). These factors have been shown to facilitate student retention which is essential for student success.

**Retention**

Retention is a critical component of success, as students who depart from college cannot complete their education, and program completion was one of the main objectives of the Student Success Act. Foundational theories on student retention contain components of student engagement and involvement in academic and extracurricular activities (Astin, 1993; Barnett, 2011; Pascarella & Terenzini, 2005; Tinto, 2006). Tinto
(1993) explained student retention in terms of the student interactions with both academic and social systems at an institution:

Broadly understood, [the model] argues that individual departure from institutions can be viewed as arising out of a longitudinal process of interactions between an individual with given attributes, skills, financial resources, prior educational experiences, and dispositions (intentions and commitments) and other members of the academic and social systems of the institution. The individual’s experience in those systems, as indicated by his/her intellectual (academic) and social (personal) integration, continually modifies his or her intentions and commitments…. [The] model posits that, other things being equal, the lower the degree of one’s social and intellectual integration into the academic and social communities of the college, the greater the likelihood of departure. (pp. 115-116)

Retention can be influenced by faculty, and research supports the concept that validation by faculty influences a student’s intent to persist in college, and that this is particularly true in the community college setting (Barnett, 2011). Student services can also influence retention, by providing services based on ecological theoretical frameworks (Bronfenbrenner, 1986) that facilitate a student’s connection with college, and which have proven to be effective for at risk populations such as Hispanic students (Arana, Castañeda-Sound, Blanchard, & Aguilar, 2011). Persistence is dependent upon interaction between the student and the institution in both their academic and social relationships, and retention is higher for students who gain integration in both
environments. Academic interactions tend to be provided through the instructional systems, while social interactions tend to be in the domain of student services.

Student services personnel, by designing and delivering services prescribed by the American Council on Education, in manners that support student growth in holistic environments supporting retention and development, promote the success of students at their institution. Technology offers the potential for providing these services to more students in a manner in which they prefer to have them delivered (Hornak et al., 2010).

**Technology and Student Services**

The research affirms the value of student services in supporting student success (Kuh et al., 2010). The use of technology at educational institutions has been constantly expanding from administrative and instructional domains to student services. This section of the literature review examines three key areas related to technology and student services: (a) the current state of technology in higher education, (b) technology acceptance in higher education, and (c) providing student services through technologies.

Technology can play a role for both students on campus and students enrolled in online programs. The adoption of technology for student’s services has become more important with the advancement of distance education where, with the introduction of online degrees, some students may never physically be present on campus. This situation is exacerbated by the alarming dropout rates in online programs as described by Ludwig-Hardman and Dunlap (2003). This is of particular concern in California, where online
education has increased from 44,639 students in 2005 to 103,676 students in 2012
California Community Colleges Chancellor’s Office, 2013b). In programs where
students are enrolled in traditional and hybrid classes, Ludwig-Harman and Dunlap
(2003) also state that technology can provide a means to supplement, enhance and extend
services to these student who are physically present at the college. This second role is
important in colleges with large commuter populations, especially community colleges
and some state universities. The value of student services in retaining students and
helping them succeed is applicable for both on-campus and distance education students,
and in the “Guidelines for Creating Student Services Online” (Shea & Armitage, 2002)
the recommendation was made for colleges to provide them in a unified way to both
groups of students.

With a mission of needing to provide essential services to students for their
development, student services personnel are faced with the challenge of delivering them
to a population of students by whom they are vastly outnumbered (Robbins, 2013).
These services have been seriously underfunded as a result of the state’s recent fiscal
crisis, and recommendations of the Student Success Task Force (California Community
Colleges Student Success Task Force, 2011) included the expanded use of technology to
extend the availability of services to more students. Understanding the viability for the
potential of technology to meet this need requires an examination of recent technology
developments related to the delivery of student services including (a) the general use of
technology in higher education, (b) a review of research related to technology used for
the delivery of student services, and (c) technology innovations and student services personnel.

**Technology in Higher Education**

According to Shier (2005) and Moneta (2005), through the later part of the 20th century the focus of much of higher education’s information technology resources were invested in the automation of administrative processes. Systems were developed or purchased to support payroll and personnel functions, and to transition the record keeping processes of registration and grading to electronic forms. Technology has improved efficiencies for activities in administrative processes and the automation of historically paper processes has been used to simplify and optimize transactions, with a result that the relationship between the institution and the student has been enhanced (Moneta, 2005).

Technology continues to play an increasingly greater role in higher education, including the manner in which instructors deliver their courses, how students register for their classes, and how students connect with each other and the institution through the Internet and mobile devices. Community colleges in general are using technology for instruction purposes, and doing so in a manner that is at last equal with four year institutions (Allen & Seaman, 2007). In order to remain competitive, however, community colleges need to also provide online access to student support services, and these technologies should provide improved services to students from recruitment through graduation and beyond (Hornak et al., 2010).
Community colleges serve a large number of students in the millennial generation, under the age of 24. These students are not only tech-savvy, but also feel technology entitled. Their expectation is to have services available for them when they need them (Hornak et al., 2010). There is a growing use of technology by students attending community colleges, particularly among younger students, and they increasingly use technology to interact with their environment (Center for Community College Student Engagement, 2009).

Research shows that faculty, students, administrators, and IT staff all believe that technology plays an important role in student success (Rosario, 2012). Institutions, over the last 20 years, have implemented technologies that have improved processes for submitting applications and registering for classes (Shier, 2005). Institutions are providing self-service access for students to their own academic records, and extending student record applications with external activities by allowing students to create career portfolios (Moneta, 2005). While a greater number of public and private institutions use self-service technologies for financial and administrative services such as tuition payment, parking services, and access to library materials, very few institutions of higher education offer student support services through self-service technologies (Herndon, 2011).

Students are interested in self-service technologies that extend beyond administrative purposes into career advising and planning. In a survey of students in the Virginia Community College system, Herndon (2011) found that students, of varying
ages, indicated that they were frequently engaged in self-advising with regard to career and college planning. Their preference was to receive student support information via interactive technologies through the web.

**Technology Innovations and Student Services**

The deployment of technology for administrative and instructional purposes has been beneficial, and has provided greater efficiencies for institutions and enhanced processes for students, but there still remain gaps related to student services, and an untapped potential for new innovations that a decade ago were not even being conceived. Institutions are beginning to explore and develop technologies that support student growth and development, and create a holistic environment that increases engagement and retention. The exploration into the use of technology that support student growth and development has increased in the last few years, as community colleges develop and deploy technology in new ways to provide students with academic advisement, personal counseling, and to build a sense of community (Hornak et al., 2010).

The potential exists for technology to be used to increase student engagement. Young (2003) suggests that data from the 2003 National Study on Student Engagement supports the concept that technology that is used effectively can improve student engagement. The innovation of social networking sites has resulted in the exploration by libraries to consider the potential for using one site, Facebook, to connect them with students attending their institution (Connell, 2009).
Although, by comparison, the literature on the use of technology for instructional purposes is greater and has a longer history, the interest of research into technologies for student services is growing. As institutions continue to expand technology for the delivery of online and hybrid courses there is a growing body of literature researching the use of technology to provide services to students and create a holistic environment that promotes student success (Connell, 2009; Hornak et al., 2010; Young, 2003).

**Technology Innovation and Student Services Personnel**

As the use of technology for student services increases, student services personnel are in the unique position to assist in identifying and developing those which would have the greatest benefit to students. Their understanding of student development and issues of self-competency, identity and engagement (Chickering & Reisser, 1993; Evans, 2010; Tinto, 2006) are important as new technologies are being explored. Blair (1998) encourages an understanding of how distance education affects both cognitive and personal development and states that distance learning does not automatically translate into disconnected and disjointed learning, but evolving technologies and distance education should be examined in the context of developing the whole student.

Through the use of technology, student services professionals can create lifelong learning opportunities inside and outside the classroom (Kuh, 1996) and produce a seamless system of education (Blair, 1998). Emerging technologies during the last decade provide opportunities in supporting students. Through social networking sites students have expanded their sense of community beyond geographic and physical
limitations. Student services personnel should explore ways to use emerging technologies such as social networking sites to engage students and build community based on shared interests and common goals (Shier, 2005).

Student services personnel may find it a challenge to meet the new responsibilities they encounter in a technology enhanced environment. These professionals are predominantly from the baby boomer generation, and historically have not felt as comfortable with technology as their students, who come from the Millennial generation (Rosario, 2012). Student services professionals who do not see the benefits of emerging technologies, or who feel technology inept, may shrink from using them. Student services professionals may also be challenged in accepting the use of technology to interact with students on tasks they traditionally used to perform face-to-face (Hornak et al., 2010).

Individuals competent in technology are critical in student services leadership teams. Moneta (2005) states that although expectations for all student services staff to be proficient in all the technologies being used by students is unrealistic, a certain level of competency will be required of each professional to understand how students perceive and use technology. Institutions should consider methods to enhance the engagement of student services professionals in the discussion of technology for student services. Hornak et al. (2010) state that it is essential for institutions to incorporate continuous professional development for administrators and staff if they are expected to use technology effectively and that access to up-to-date technological competencies need to
be maintained. Teams of individuals including Information Technology and student services, should come together in planning which student services should be enhanced through technology based initiatives (Hornak et al., 2010), and knowledgeable technology staff should be dedicated to the effort, either as a direct member of the student services staff or as a reliable partnered service (Moneta, 2005).

The effort of deploying technology as a solution without considering the business processes and can be a costly endeavor, and lead to failed implementations. Rigby, Day, Forrester, and Burnett (2000) recommended as best practices for the 21st century identifying customer needs and planning for organizational change, and which are considered essential elements for implementing technologies as a change agent (Moneta, 2005). As technology is evolving in its use for delivering services to students, the acceptance of technology solutions by student services personnel becomes more important.

**Technology Acceptance Models**

This section of the literature review covers three main areas. Theories on the acceptance of technology, beginning with the Technology Acceptance Model (TAM) as supported by the Theory of Reasoned Action (TRA), extensions to the TAM based on constructs from the Theory of Planned Behavior (TPB), and constructs found in the Unified Theory of Acceptance and Use of Technology (UTAUT) (Ajzen, 1988; Davis, 1989; Fishbein & Ajzen, 1975; Venkatesh, Morris, Davis, & Davis, 2003) are discussed.
The application of technology acceptance models in various environments (Bruner & Kumar, 2005; Koufairs, 2002; Lee & Hsieh, 2011; Lin, 2010), including deficiencies when applied in mandatory settings (Chan et al., 2010; Koh, Prybutok, Ryan, & Wu, 2010) is presented. Finally, the application of technology acceptance models in higher education (Edmunds, Thorpe, & Conole, 2012; Lee, 2008; Un Jan & Contreras, 2011) are introduced.

In researching teachers’ intention to use technology, Teo (2013) stated the following:

Technology acceptance is posited to be influenced by a variety of factors, including individual differences, social influences, beliefs, attitudes and situational influences (Agarwal, 2000; Teo, 2009a). A majority of the conceptualizations of technology acceptance have drawn on theories and models from social psychology, notably the theory of reasoned action (TRA) (Fishbein & Ajzen, 1975), theory of planned behaviour (TPB) (Ajzen, 1991), technology acceptance model (TAM) (Davis, 1989), and unified theory of acceptance and use of technology (UTAUT) (Venkatesh, Morris, Davis & Davis, 2003). (p. E81)

TAM constructs are identified as perceived usefulness (PU) and perceived ease of use (PEU) (Davis, 1989), and research supports social norm (SN) as a valid extension to the TAM constructs (Ajzen, 1991). Research by Venkatesh et al. (2003) extended the model further by including facilitating conditions they found to influence an individual’s intention to use technology. Theoretical models consistently identify the determinants of
PU, PEU, and SN along with facilitating conditions as influencing the behavioral intention of an individual to use a technology Teo (2013).

The Technology Acceptance Models and its Extensions

The capability to predict the rate of acceptance of technology was proposed with the introduction of the Technology Acceptance Model (Davis, 1989), a framework used to describe factors which predict and influence technology adoption. Based on the Theory of Reasoned Action (Fishbein & Ajzen, 1975) the TAM has been researched to verify its validity in various environments. Multiple extensions have also been proposed to enhance the model.

The technology acceptance model (TAM). In an effort to predict the usage of a technology before it was developed and deployed, Davis (1989) performed a study based on the Theory of Reasoned Action (TRA), a behavioral theory that described determinants that influence an individual’s intention to engage in a particular behavior or action, referred to as behavioral intention (BI). Applying the TRA to technology, Davis’ (1989) study formed the basis for the Technology Acceptance Model (TAM), in which he identified two predictors, perceived usefulness (PU) and perceived ease of use (PEU) as determinants of behavioral intention of an individual to use a technology. TAM provides insight into how behavioral intention is formed (Koh et al., 2010) and states that an individual’s intention to use a technology can be determined before the technology is developed and deployed by examining two variables; the users perceptions that they will find the technology useful, and that they will find the technology easy to use. The
perceived usefulness and perceived ease of use are major determinants in predicting a user’s intention to use a technology, and intention to use serves as a measure to predict acceptance (Amoako-Gyapah, 2007; Lee, 2008; Un Jan & Contreras, 2011). Lee and Hsieh (2011) concluded that TAM can be useful in predicting end user acceptance.

One of the reasons Davis (1989) developed the TAM is that it can be used early in a project, before development and implementation, and can be a factor in increasing the success rate of projects since perceived usefulness and perceived ease of use influence an individual’s intention of using a technology once it is deployed. Sanchez-Franco (2010) supported this perspective, noting that a system which incorporates features based on users input can subsequently influence their reaction favorably in later interactions with the system, increasing their perceived usefulness and perceived ease of use of the technology, affecting the users positively, and creating a relationship which results in higher satisfaction and system usage.

King and Jun (2006), in a meta-analysis of 88 studies involving more than 12,000 observations, concluded that that the TAM constructs of PU and PEU in predicting BI are highly reliable, and that the influence of PU is profound and accounts for much of the influence of PEU. King and Jun (2006) also asserted that TAM, because of its simplicity and understandability, is one of the most widely used models of technology acceptance in Information Systems research.

**Extending TAM with subjective norms.** Even though Davis’s (1989) research validated that perceived usefulness (PU) and perceived ease of use (PEU) influenced
attitude (A), and were major determinants of intention to use, he did not explore subjective norms in his study. The Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975) posited that an individual’s intention to engage in a particular behavior, called Behavioral Intention (BI), was based upon two determinants, their attitude (A), and the influence of subjective norms (SN), how positively or negatively others viewed that behavior. Davis’s (1989) research validated that perceived usefulness and perceived ease of use influenced attitude, and were major determinants of intention to use, but he did not explore subjective norms in his study.

Subjective norms, also referred to as social influence, characterize the impact that certain individuals whom the user finds influential has on their intention to use technology. Typically these influential individuals are their peers and leaders in the organization. According to Malhotra and Galletta (1999), TAM did not account for social interactions that may influence an individual’s intention to use a technology. In addition to perceived usefulness and perceived ease of use, Un Jan and Contreras (2011) found that students used technology based on influences from their social environment, specifically professors and classmates. Additional research (Hardgrave & Johnson, 2003; Koh et al., 2010; Malhotra & Galletta, 1999; Un Jan & Contreras, 2011) subsequently supported subjective norm as a valid determinant in addition to perceived usefulness and perceived ease of use, and recommended its inclusion as an extension to the technology acceptance model.
Research performed by Koh et al. (2010) found that social influence has a direct positive effect on performance expectancy. In their study, Hardgrave and Johnson (2003) found that although subjective norm does not directly impact an individual’s intention to use a technology, it does influence their perception of its usefulness, and thereby does modify the likelihood of their acceptance of a technology. Lee and Park (2008) found that subjective norm was not a significant construct in their study of the acceptance of Internet technology by 374 employees in 10 Korean companies covering five industries.

The Theory of Planned Behavior was also based upon the Theory of Reasoned Action, but in it Ajzen (1988) theorized that there were three determinants of behavioral intention (BI): attitude (A), subjective norm (SN), and the additional factor of their perceived behavioral control (PBC). Perceived behavioral control is the belief that an individual who intends to engage in a behavior has the resources necessary to carry out the behavior. Thus the TPB posited the concept that an individual’s intention is determined by their perception of the usefulness of a behavior which influences attitude, their ability to perform it, and the social response to their action. The actual performance of a behavior is predicated on behavioral intention, along with the degree of actual control one has over performing the action (Ajzen, 1988). Combining the Theory of Planned Behavior (TPB) along with TAM produced a model for Information System Developers (Hardgrave & Johnson, 2003).

**Extending TAM with facilitating conditions.** In an effort to create a unified model, Venkatesh et al. (2003) performed a study of four organizations over a six month
period, which resulted in a unified model, the Unified Theory of Acceptance and Use of Technology (UTAUT). It held that four key constructs were determinants of usage intention: performance expectancy, effort expectancy, social influence, and facilitating conditions. Teo (2013) states the first three determinants are operationalized as perceived usefulness, perceived ease of use, and social norm respectively. Facilitating conditions refer to the organizational and technical infrastructure that an individual believes to exist in support of their use of technology (Taylor & Todd, 1995; Teo, 2013; Venkatesh et al., 2003). In their research into a unified theory on user acceptance of technology, Venkatesh et al. (2003) summarized facilitating conditions from a study by Thompson and Higgens (1991) involving 212 individuals at a multi-national firm into three major items: guidance in selecting the system, training, and support with system difficulties.

In a study of 786 potential users of a computer resource center over a period of twelve weeks, Taylor and Todd (1995) researched determinants from both TAM and TPB, and found that while both theories contained constructs useful as indicators on behavioral intention, TPB provided insight into two facilitating conditions, the value of user participation in forming normative beliefs, and the impact of training on self-efficacy. User participation and involvement was found to influence the acceptance of technology by Amoako-Gyapah (2007) in his study of 571 individuals and their intention to use an ERP system. Research performed by Lee (2008) in a study into extending TAM concluded that perceived resources for training and support partially influenced student’s adoption of technology. In their research on personal innovativeness in IT,
Agarwal and Prasad (1998) confirmed that the availability of resources positively influences technology acceptance especially when implementation resources are limited.

Research has supported PU, PEU, and SN (Ajzen, 1988; Amoako-Gyapah, 2007; Davis, 1989; King & Jun, 2006; Malhotra & Galletta, 1999; Sanchez-Franco, 2010; Un Jan & Contreras, 2011; Venkatesh et al., 2003) and the influence of the facilitating conditions of involvement in system selection and development, training and professional development, and support when encountering system difficulties (Agarwal & Prasad, 1998; Amoako-Gyapah, 2007; Lee, 2008; Taylor & Todd, 1995; Thompson & Higgens, 1991; Venkatesh et al., 2003) as constructs in determining the intention of users to accept technology. These constructs have been validated in various environments, including commercial, non-commercial and educational settings.

**The Application of Technology Acceptance Models in Various Environments**

TAM has been researched for its applicability in various environments, including commercial (Koufairs, 2002; Lin, 2010), non-commercial (Chan et al., 2010; Carter & Bélange, 2005), and educational settings (Edmunds et al., 2012; Lee, 2008; Un Jan & Contreras, 2011). Deficiencies of the model have also been researched, especially for institutions where the technology is mandated and not voluntary (Koh et al., 2010).

**Applications in commercial and non-commercial environments.** The major constructs of technology acceptance models have been validated in studies of technologies used in commercial industries, such as tourism in a study by Lai (2013) of 205 tourists in Southeast China, and by Lin (2010) in a study of 242 users of Taiwanese
online travel sites. Constructs have also been validated in the consumer shopping setting by Koufairs (2002) in a study applying TAM to online consumer behavior, and by Bruner and Kumar (2005) in their study of consumer acceptance of handheld internet devices. In addition, a study by Lee and Hsieh (2011) of 552 employees in a business environment in Taiwan supported the validation of TAM constructs for their intention to use an e-learning system.

Limited research is available in studies exploring the validity of technology acceptance models in non-commercial settings, with the primarily focus of research in this area being for technology in accessing governmental services. Chan et al. (2010) performed a study 1,172 citizens of Hong Kong and the mandatory use of technology for accessing government services. Their findings validated the core constructs, but found that facilitating conditions were of greater influence than ease of use. In a smaller study by Carter and Bélange (2005) of 105 individuals on their intention to use technology to access government services, voluntarily, they found that relative advantage, which they aligned with perceived usefulness, did not directly influence the intention of citizens to use e-government services, but that perceived ease of use did have a strong influence.

**Deficiencies in mandatory environments.** The TAM framework centers on the intention to use (Davis, 1989; Venkatesh et al., 2003). In their research, Koh et al. (2010) state that TAM’s applicability in mandatory environments may appear irrelevant, because users must use the system, and there is not a concept of intention to use. In environments where the use of a technology is voluntary usage be measured as an absolute: the
individual uses, or does not use, a technology. Koh et al. (2010) posited that intention to use makes sense only in voluntary organizations where actual use varies. In settings where there is mandatory use of a technology a user may underutilize or sabotage a system that they are required to use, therefore, in environments where use is mandatory, Koh et al. (2010) suggested that the definition of use include attitude as a key construct, and recommended that use be measured as both the frequency and the intensity of using a technology.

In research by Chan et al. (2010) on the mandatory use of technology for accessing government services, their findings suggested that facilitating conditions were of greater influence in the mandatory use environment. Often researchers place a strong emphasis of perceived usefulness on intention to use, when settings that require mandatory use that determinant has less value. Koh et al. (2010) stated it was rare to find research that included net benefits of a technology to an organization, and that in mandatory use environments users have greater satisfaction with a technology system if they understand the net benefit to the organization.

The TAMs key constructs of perceived usefulness and perceived ease of have found to be valid predictors of technology acceptance in a number of commercial as well as noncommercial environments. In settings where the use of technology is mandated, and where usage is defined as the frequency and intensity of using technology, facilitating conditions have greater influence on technology acceptance.
Technology acceptance in higher education. In addition to commercial and non-commercial settings TAM has been shown to be a valid model to predict system acceptance in higher education by students (Edmunds et al., 2012; Lee, 2008; Un Jan & Contreras, 2011). Using the TAM framework, Edmunds et al. (2012) researched students in higher education and found that in addition to the usefulness of technology in coursework and university life, their acceptance of technology was also influenced by its usefulness in work environments outside the university. Although many studies focus on acceptance of technology by students, according to Lee (2008) it is rare to find studies that focus on technology acceptance by professionals in educational organizations.

A review of the literature has shown the value of student services in educational institutions, and the increasing use of technology in colleges and universities. Expectations continue to grow in California’s community colleges for the increased use of technology to deliver services to students. The literature also shows that technology acceptance is influenced by the constructs of perceived usefulness and perceived ease of use, as well as the facilitating conditions of user inclusion in the system selection and development process, training and specialized instruction, and support when encountering system difficulties. These have been researched in commercial, non-commercial and educational environments as well as settings where usage is mandatory. A review of the literature supports the research questions being explored in this study on the factors which influence student services professionals in their acceptance of technologies to deliver services to community college students.
Chapter 3

METHODOLOGY

Introduction

The purpose of this study is to identify the factors that influence the acceptance of technology by student services personnel in the California Community College system. The study also was designed to explore the perceptions of student services personnel on the use of technology for providing services related to student success; orientation, assessment, career and educational planning. The research methodology for this study utilized a quantitative design to investigate and answer the research questions.

Survey research describes the methodology and the strategy for data collection, and the tool for data collection was a survey (Cowan, 2007) created by the research and administered through the SurveyMonkey website. This chapter describes the setting, the population and sample, data collection, instrumentation, and data analysis procedures.

Setting of the Study

The study was conducted with student services personnel in the California Community Colleges System (CCCS). The California Community Colleges is the largest system of higher education in the nation, with more than 2.4 million students attending 112 colleges (California Community Colleges Chancellor’s Office, 2014). Created by legislation in 1967, it offers a wide variety of educational and career goals. The colleges
provide workforce training, basic courses in English and math, certificate and degree programs, and preparation for transfer to four-year institutions.

Under the California Master Plan for Higher Education, the CCCS is a part of the state’s three-tier public higher education system, which also includes the University of California system and the California State University system. Like the two other systems, the CCCS is headed by an executive officer and a governing board. The 17 member Board of Governors (BOG) sets direction for the system and is in turn appointed by the California Governor. They appoint the Chancellor who is the chief executive officer of the system. Locally elected Boards of Trustees work on the district level with Presidents who run the individual college campuses.

For the fall 2013 term there were a total of 35,457 individuals employed within the California Community College System, of which 750 were educational administrators, 23,881 were academic, and 10,826 were classified employees (California Community Colleges Chancellor’s Office, 2013a). The gender of employees was 54.6% female and 45.4% male. Demographics related to age were as follows: 22% were ages 18-39; 23% 40-49; 29% 50-59; and 26% 60+.

**Population and Sample**

This study researched the perceptions of student services personnel at California Community Colleges. The study included administrative, managerial, supervisory and classified staff, as well as counseling faculty and instructional faculty. The study was
performed through a survey that was administered to student services personnel in the
112 community colleges in California who either are members of three e-mail
distribution lists maintained by the California Community College Chancellor’s Office
(CCCCO), or are individuals who subscribe to three specific list serves maintained by the
California Community College Technology Center. The e-mail distribution lists at the
CCCO are maintained by the Chancellors Office; individuals who are placed into a
position of admissions and registrar, chief student services officer, or matriculation
coordinator at a college have their name updated in the distribution list. The perceptions
of these individuals were important to the survey based upon their position,
responsibilities, and their experience with student services.

This study focuses on specific services, formerly known as matriculation, which
are related to student success, including orientation, assessment, career and educational
planning, and counseling. These services have traditionally been provided through
matriculation programs and counseling staff at the colleges, with student services deans
responsible for the oversight of these activities. The following three list serves
maintained by the California Community College Technology Center are used to
facilitate communications on topics of interest to members who voluntarily subscribe,
including topics related to this study:

- CCC-COUNSELORS – CCC General Counselors
- CCC-MATRIC – CCC Matriculation Program-Coordinators
- DEANS-STDT-SRVCS – Student Services Deans
This study was based on a convenience sample of student services personnel who either are members of the distribution lists or who subscribe to the list serve and chose to participate. A total 1,691 individuals were invited to participate in the study, of which 1,126 individuals subscribe to the Technology Center lists, and 565 individuals are members of the Chancellors Office e-mail distribution lists. The following lists were selected for the survey:

- Distribution lists maintained by the California Community College Chancellor’s Office:
  - adreg-all@cccco.edu – admissions and registrar (188 members)
  - csso-all@cccco.edu – chief student services officer (189 members)
  - mat-all@cccco.edu – matriculation coordinator (188 members)

- List serves maintained by the California Community College Technology Center:
  - CCC-COUNSELORS – CCC General Counselors (518 subscribers)
  - CCC-MATRIC – CCC Matriculation Program-Coordinators (439 subscribers)
  - DEANS-STDT-SRVCS – Student Services Deans (169 subscribers)

This study involved a research of the population to which the study applied. A review of survey data was completed for all personnel who completed the survey. The participants for the survey were selected through a convenient sample, as they were on email lists, or subscribed to list serves, which were related to student services in
California Community Colleges. Participants did not receive any compensation for completing this questionnaire and did so voluntarily.

**Design of the Study**

A cross sectional design was conducted as the single event when then researcher collected data from the sample of a population only once (Cowan, 2007). The cross-sectional design method was a one-time survey to a single cohort of student services personnel in California Community Colleges. The cross sectional study was quick and studied a large number of student services personnel across the state of California. The study was designed to collect data on the perceptions of student services personnel on specific variables which have been shown to influence and predict the use of technology.

**Data Collection**

Data collection was performed through a quantitative methodology using a survey that allowed participants to select from predetermined list of possible answers. All data collection occurred via an online survey administered through the SurveyMonkey website. The data collection method was through a web based survey hosted on SurveyMonkey. The following steps were taken to administer the survey:

- An Invitation to Participate in the survey (see Appendix A) was sent by e-mail to 1,691 individuals on the selected lists on January 15, 2014. This included a link to the survey hosted on SurveyMonkey. By selecting the link individuals were taken into the surveys Welcome page. The email invitation included the name
and contact information of the researcher, so participants had the ability to contact
the researcher with any questions or concerns.

- A reminder e-mail (see Appendix B) was sent to individuals on the selected lists a
two weeks following the original invitation, on January 28, 2104.
- A copy of the survey is attached to this application as Appendix C.
- The survey Welcome page provided a brief overview of the study with
instructions on how to complete the survey, and instructions on how to exit the
survey if they do not wish to participate. Participation was voluntary and
individuals had the option to skip any questions they did not wish to answer.
- The Consent to Participate Form was presented to individuals following the
Welcome page.
- The survey remained open for a total of four weeks, and was closed on February
12, 2104.

The researcher had access to the data in real-time as it was collected through
SurveyMonkey, a secure, password-protected site. All data was compiled in aggregate
and no individual respondents were identified in the analysis. Data will be retained no
longer than six months after the survey was completed.

Instrumentation

This study involved an evaluation research of the population to which the study
applied. A review of survey data was completed for all personnel who completed the
survey. The participants for the survey were selected through a convenient sample, as
they were on email lists, or subscribed to list serves, which were related to student services in California Community Colleges. Participants did not receive any compensation for completing this questionnaire and did so voluntarily.

The cross-sectional design for this 19-question instrument study used quantitative questions. The survey questions to collect data for the first research question on the factors which influence the acceptance of technology were derived from studies starting with the seminal work by (Davis, 1989) which identified Usefulness and Ease of Use as two primary constructs for predicting intention to use a system. In his landmark research on a unified view on user acceptance, Venkatesh et al. (2003) included tables that identified various constructs and survey items which were used to indicate an individual’s perceptions of that construct. It was from selected tables used for identifying the constructs of performance expectancy (usefulness), effort expectancy (ease of use), social norm and facilitating condition that I selected the basic survey items I used in my questionnaire.

The survey items were then reviewed with the research literature to ensure a consistent support of constructs. The researcher then engaged in a review of the survey items with Betty Glyer-Culver, a professional researcher who recommended two primary areas for improvement (personal communication, January 6, 2014). The first recommendation was that the survey seemed dated, as the items were from research performed in 2003, and would improve if they were updated. The second recommendation was to modify the questions so they were able to connect with the
survey participants, including verbiage referencing student services, as well as colleges. After these modifications were made the instrument was developed within Survey Monkey and sent to a couple individuals at community colleges in the Sacramento area in order to validate the instrument and determine the length of time to complete. These initial reviewers provided comments which resulted in minor modifications to the instrument, including word changes to make it more consistent.

In order to collect data, this researcher asked student services personnel to respond to a series of statements using a 4-point Likert-Scale (Strongly Agree, Moderately Agree, Moderately Disagree, and Strongly Disagree), as well as including an option for Don’t Know/Does Not Apply. The rationale behind selecting a 4-point Likert Scale, instead of a 5-point scale, was that the researcher wanted to get a feeling on the user’s perceptions and therefore did not provide for a neutral option.

The survey items were grouped according to the variable factors from Davis (1989) and Venkatesh et al. (2003). Variables were selected based developmental theories supported by the findings of Venkatesh et al. (2003) UTAUT theories.
Chapter 4

RESULTS AND DATA ANALYSIS

Introduction

The purpose of this study was to determine the factors which influenced student services personnel in California Community Colleges in the acceptance of technology for the delivery of services to students. The researcher believed that a better understanding of these factors would provide information for administrators which could be used in their technology planning process for student services.

The data being reported in this chapter were collected through a survey based on the study by Venkatesh et al. (2003) in the Universal Theory of Acceptance and Use of Technology, modified to ensure that the questions and available options were relevant to the survey participants. The survey questions included Likert-type scales, from strongly agree to strongly disagree, and multiple choice. The survey participants were staff, counseling faculty, and administrators in the California Community Colleges who subscribed to specific list serves and e-mail distribution lists related to student services in the California Community College system. An e-mail that included a link to the survey was sent out to participants on Wednesday, January 15, 2014 and the survey remained available for four weeks, until February 12, 2014 at the Survey Monkey website. A second e-mail was sent out approximately two weeks after the original e-mail in an effort to increase the number of respondents. There were a total of 246 respondents who
participated in the survey, including 19 vice presidents, 50 deans, 31 supervisors, 27 classified staff, 95 counseling faculty, three instructional faculty, 23 who identified themselves in another category, and 21 who chose not to identify their current position.

This presentation of the data is organized into four main sections: (a) a summary of the responses to the survey, (b) data related to the research question concerning the factors that influence the acceptance of technology by student services personnel, (c) data related to the exploratory research question regarding the matriculation services that student services personnel believe can be offered through a technology enabled solution, and (d) exploratory research data regarding matriculation services that are currently being delivered through technology at community colleges in California. A summary of the findings is found at the end of the presentation of the data.

Presentation of the Data

Response Rate

The survey was accessed by 246 individuals, out of a total of 1,691 that were invited to participate, yielding a response rate of 14.5%. Out of the 246 participants, 21 did not answer any of the survey items, and 19 only answered one of the survey items. Of those who started, a total of 201 participants, 81.7%, finished the survey.
Summary of Respondents

Table 1 provides demographic data regarding the respondents to the survey, covering their ethnicity, current position, years worked at the college level, age and gender. Table 1 shows the demographics of the respondents to the survey.

Table 1

Demographics

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>African American</th>
<th>Asian</th>
<th>Latino</th>
<th>Native American</th>
<th>White</th>
<th>Multi-race</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender Male</td>
<td>Count</td>
<td>2</td>
<td>9</td>
<td>12</td>
<td>1</td>
<td>31</td>
<td>56</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>13.3</td>
<td>42.9</td>
<td>35.3</td>
<td>33.3</td>
<td>29.0</td>
<td>9.1</td>
</tr>
<tr>
<td>Female</td>
<td>Count</td>
<td>13</td>
<td>12</td>
<td>22</td>
<td>2</td>
<td>76</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>86.7</td>
<td>57.1</td>
<td>64.7</td>
<td>66.7</td>
<td>71.0</td>
<td>90.9</td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
<td>15</td>
<td>21</td>
<td>34</td>
<td>3</td>
<td>107</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

| Position        | Count            | 5     | 1      | 1               | 0     | 11         | 0     | 18   |
| Vice            | %                | 33.3  | 4.8    | 2.7             | 0.0   | 10.1       | 0.0   | 9.1  |
| President       | Count            | 2     | 5      | 7               | 1     | 24         | 5     | 44   |
|                 | %                | 13.3  | 23.8   | 18.9            | 33.3  | 22.0       | 38.5  | 22.2 |
| Dean            | Count            | 2     | 1      | 4               | 1     | 16         | 0     | 24   |
|                 | %                | 13.3  | 4.8    | 10.8            | 33.3  | 14.7       | 0.0   | 12.1 |
| Supervisor      | Count            | 1     | 2      | 6               | 0     | 9          | 1     | 19   |
|                 | %                | 6.7   | 9.5    | 16.2            | 0.0   | 8.3        | 7.7   | 9.6  |
| Classified      | Count            | 3     | 10     | 16              | 1     | 40         | 5     | 75   |
| Staff           | %                | 20.0  | 47.6   | 43.2            | 33.3  | 36.7       | 38.5  | 37.9 |
| Faculty - Counselor | Count | 0     | 0      | 0               | 0     | 2          | 0     | 2    |
|                 | %                | 0.0   | 0.0    | 0.0             | 0.0   | 1.8        | 0.0   | 1.0  |
| Faculty - Instructor | Count | 2     | 2      | 3               | 0     | 7          | 2     | 16   |
|                 | %                | 13.3  | 9.5    | 8.1             | 0.0   | 6.4        | 15.4  | 8.1  |
| Total           | Count            | 15    | 21     | 37              | 3     | 109        | 13    | 198  |
|                 | %                | 100.0 | 100.0  | 100.0           | 100.0 | 100.0      | 100.0 | 100.0 |
| Years At College Level | Count | 3     | 6      | 10              | 1     | 20         | 3     | 43   |
| 6-12            | %                | 13.3  | 14.3   | 5.7             | 0.0   | 1.9        | 9.1   | 5.2  |
| 13-20           | Count            | 3     | 6      | 8               | 1     | 37         | 5     | 60   |
|                 | %                | 20.0  | 28.6   | 28.6            | 33.3  | 18.5       | 27.3  | 22.3 |
| 21-29           | Count            | 6     | 4      | 13              | 1     | 34         | 2     | 60   |
|                 | %                | 20.0  | 28.6   | 22.9            | 33.3  | 34.3       | 45.5  | 31.1 |
| 30+             | Count            | 1     | 2      | 2               | 0     | 15         | 0     | 20   |
|                 | %                | 6.7   | 9.5    | 5.7             | 0.0   | 13.9       | 0.0   | 10.4 |
| Total           | Count            | 15    | 21     | 35              | 3     | 108        | 11    | 193  |
|                 | %                | 100.0 | 100.0  | 100.0           | 100.0 | 100.0      | 100.0 | 100.0 |
Table 1 continued

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>African American</th>
<th>Asian</th>
<th>Latino</th>
<th>Native American</th>
<th>White</th>
<th>Multi-race</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21-24</td>
<td>Count</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>25-29</td>
<td>Count</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>0.0</td>
<td>0.0</td>
<td>2.8</td>
<td>0.0</td>
<td>8.3</td>
<td>1.0</td>
</tr>
<tr>
<td>30-39</td>
<td>Count</td>
<td>0</td>
<td>8</td>
<td>4</td>
<td>0</td>
<td>16</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>0.0</td>
<td>38.1</td>
<td>11.1</td>
<td>0.0</td>
<td>48.7</td>
<td>16.4</td>
</tr>
<tr>
<td>40-49</td>
<td>Count</td>
<td>8</td>
<td>5</td>
<td>9</td>
<td>0</td>
<td>23</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>53.3</td>
<td>23.8</td>
<td>25.0</td>
<td>0.0</td>
<td>21.3</td>
<td>50</td>
</tr>
<tr>
<td>50-59</td>
<td>Count</td>
<td>6</td>
<td>4</td>
<td>15</td>
<td>3</td>
<td>42</td>
<td>71</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>40.0</td>
<td>19.0</td>
<td>41.7</td>
<td>100.0</td>
<td>38.9</td>
<td>8.3</td>
</tr>
<tr>
<td>60+</td>
<td>Count</td>
<td>1</td>
<td>4</td>
<td>7</td>
<td>0</td>
<td>27</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>6.7</td>
<td>19.0</td>
<td>19.4</td>
<td>0.0</td>
<td>25.0</td>
<td>8.3</td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
<td>15</td>
<td>21</td>
<td>36</td>
<td>3</td>
<td>108</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

The respondents to the survey were primarily female, at 70.7%, and most identified their position as faculty-counseling, at 37.9%. Most were between the ages of 50-59, and only 34 (or 17.4%) were less than 40 years old. They tended to have many years of experience at the college level, with 72.6% stating they had 13 years of experience or more, and with 41.5% having 21 or more years of experience. Most of the respondents were White, at 107 out of 191 who answered the survey item on gender, followed by Latino (34), Asian (21), and African American (15). There were 11 individuals identifying themselves as multi-racial, and three Native Americans participated in the survey.

Data on Predictors and Factors Influencing Technology Acceptance

This section provides data collected in relation to the research question on the predictors and factors that influence the acceptance of technology by student services personnel. The findings in this section are presented in four groupings related to (a)
perceived usefulness, (b) perceived ease of use, (c) facilitating conditions of user participation in selecting the system, training, and system support, and (d) the factor of social influence and subjective norm. Data related to the predictor of perceived usefulness are revealed in Tables 2 to 5, and data related to perceived ease of use are revealed in Tables 6, 7, and 8. Tables 9 through 13 provide data on the facilitating conditions of participation, training and support, while Tables 14 through 17 portray data related to the social influence and social norm.

**Data on perceived usefulness.** Table 2 is a representation of the perception that the respondents believed that technology is useful in helping them provide services to students.
Table 2

Usefulness of Technology for Providing Services to Students

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Disagree</td>
<td>1</td>
<td>0.5</td>
</tr>
<tr>
<td>Disagree</td>
<td>1</td>
<td>0.5</td>
</tr>
<tr>
<td>Agree</td>
<td>25</td>
<td>12.1</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>177</td>
<td>85.9</td>
</tr>
<tr>
<td>Not Applicable/Do Not Know</td>
<td>2</td>
<td>1.0</td>
</tr>
<tr>
<td>Total</td>
<td>206</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 2 shows out of 206 respondents to the statement that technology is useful in helping them provide services to students, 85.9% strongly agreed, 12.1% agreed, while 0.5% disagreed, 0.5% strongly disagreed, and 1.0% answered the statement was not applicable or they did not know. A high percentage of respondents, 98%, either agreed or strongly agreed that technology is useful.

Table 3 shows the perception of the usefulness of technology by respondents in helping them accomplish student services tasks more quickly.
Table 3

Usefulness of Technology for Accomplishing Tasks Quickly

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Disagree</td>
<td>2</td>
<td>1.0</td>
</tr>
<tr>
<td>Disagree</td>
<td>8</td>
<td>3.9</td>
</tr>
<tr>
<td>Agree</td>
<td>45</td>
<td>21.8</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>149</td>
<td>72.3</td>
</tr>
<tr>
<td>Not Applicable/Do Not Know</td>
<td>2</td>
<td>1.0</td>
</tr>
<tr>
<td>Total</td>
<td>206</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 3 shows out of 206 respondents to the statement that technology is useful in helping them accomplish their tasks related to student services more quickly that 72.3% strongly agreed, 21.8% agreed, while 3.9% disagreed, 1.0% strongly disagreed, and 1.0% answered the statement was not applicable or they did not know. The high percentage of respondents that either agreed or strongly agreed was at 94.1%.

Table 4 shows the perception of the usefulness of technology by respondents in increasing the efficiency of their time interacting with students.
Table 4

Usefulness of Technology for Increasing Efficiency of Time with Students

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Disagree</td>
<td>3</td>
<td>1.5</td>
</tr>
<tr>
<td>Disagree</td>
<td>13</td>
<td>6.3</td>
</tr>
<tr>
<td>Agree</td>
<td>51</td>
<td>24.7</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>124</td>
<td>60.2</td>
</tr>
<tr>
<td>Not Applicable/Do Not Know</td>
<td>15</td>
<td>7.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>206</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Table 4 shows out of 206 respondents to the statement that technology is useful in helping them improve the efficiency of their time with students that 60.2% strongly agreed, 24.7% agreed, while 6.3% disagreed, 1.5% strongly disagreed, and 7.3% answered the statement was not applicable or they did not know. The high percentage of respondents that either agreed or strongly agreed was at 84.9%, indicating that among the respondents there is a strong perception of the usefulness of technology for increasing the efficiency of their time with students.

Table 5 is a representation of the perception that the respondents believed that technology is useful in increasing the quality of their student services work.
Table 5

Usefulness of Technology for Increasing Quality of Work

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Disagree</td>
<td>2</td>
<td>1.0</td>
</tr>
<tr>
<td>Disagree</td>
<td>15</td>
<td>7.3</td>
</tr>
<tr>
<td>Agree</td>
<td>68</td>
<td>33.2</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>116</td>
<td>56.5</td>
</tr>
<tr>
<td>Not Applicable/Do Not Know</td>
<td>4</td>
<td>2.0</td>
</tr>
<tr>
<td>Total</td>
<td>205</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 5 shows out of 205 respondents to the statement that technology is useful in helping them increase the quality of their student services that 56.5% strongly agreed, 33.2% agreed, while 7.3% disagreed, 1.0% strongly disagreed, and 2.0% answered the statement was not applicable or they did not know. The high percentage of respondents that either agreed or strongly agreed at 89.7%, indicating that among the respondents there is a strong perception of the usefulness of technology for increasing the efficiency of their time with students.

The data in Tables 2 through 5 reflect the respondent’s belief, by agreeing or strongly agreeing with statements, of the perceived usefulness of technology in their student services work. Agreement ranged between 84.9% to 98% for the four aspects of perceived usefulness.
Data on perceived ease of use. Tables 6 through 8 show the respondents belief related to their perceived ease of use of technology.

Table 6 portrays the perception that the respondents believed in general that new technologies are easy to use.

Table 6
Perceived Ease of Use of New Technologies in General

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Disagree</td>
<td>4</td>
<td>2.0</td>
</tr>
<tr>
<td>Disagree</td>
<td>19</td>
<td>9.3</td>
</tr>
<tr>
<td>Agree</td>
<td>111</td>
<td>54.1</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>70</td>
<td>34.1</td>
</tr>
<tr>
<td>Not Applicable/Do Not Know</td>
<td>1</td>
<td>0.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>205</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Table 6 shows of 205 respondents to the statement that in general they find new technologies easy to use that 54.1% agreed, 34.1% strongly agreed, while 9.3% disagreed, 2.0% strongly disagreed, and 0.5% answered the statement was not applicable or they did not know. The percentage of respondents that either agreed or strongly agreed was at 88.2%, a value that indicates a high percentage of student services personnel perceive that new technologies, in general, are easy for them to use.

Table 7 portrays the perception that the respondents find it easy for them to become adept at using new technology in their student services work.
Table 7
Perceived Ease of Use at New Technologies in Student Services

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Disagree</td>
<td>4</td>
<td>2.0</td>
</tr>
<tr>
<td>Disagree</td>
<td>22</td>
<td>10.8</td>
</tr>
<tr>
<td>Agree</td>
<td>94</td>
<td>46.3</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>80</td>
<td>39.4</td>
</tr>
<tr>
<td>Not Applicable/Do Not Know</td>
<td>3</td>
<td>1.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>203</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Table 7 shows of 203 respondents to the statement that they have found it easy to become adept at using new technology in their student services work, that 46.3% agreed, 39.4% strongly agreed, while 10.8% disagreed, 2.0% strongly disagreed, and 1.5% answered the statement was not applicable or they did not know. The percentage of respondents that either agreed or strongly agreed was at 85.7%, a value that indicates a high percentage of student services personnel perceive it is easy for them to become adept at using new technologies for their student services work.

Table 8 indicates of the perception that the respondents find it easy for them to get the student services system to do what they want it to do.
Table 8

Perceived Ease of Use of the Student Services System

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Disagree</td>
<td>15</td>
<td>7.4</td>
</tr>
<tr>
<td>Disagree</td>
<td>75</td>
<td>36.8</td>
</tr>
<tr>
<td>Agree</td>
<td>88</td>
<td>43.1</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>17</td>
<td>8.3</td>
</tr>
<tr>
<td>Not Applicable/Do Not Know</td>
<td>9</td>
<td>4.4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>204</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Table 8 shows of 204 respondents to the statement that it is easy for them to get the student services system to do what they want it to do, that 43.1% agreed, 8.3% strongly agreed, while 36.8% disagreed, 7.4% strongly disagreed, and 4.4% answered the statement was not applicable or they did not know. The percentage of respondents that either agreed or strongly agreed was barely a majority at 51.5%, and the respondents that either disagreed or strongly disagreed was at 44.1%, values that indicate that respondents appeared divided about their perceived ease of use of the student services system.

The data in Tables 6 through 8 reflect the respondent’s belief, by agreeing or strongly agreeing with statements, of the perceived ease of use of technology in their student services work. The data indicated that the perceived ease of use for new technologies in general, and their ability to become adept at new student services technologies, was high with rates of agreement at 88.2% and 85.7%, respectively.
Survey respondents appeared neutral on the perceived ease of use with their student services system, with 51.5% agreeing or strongly agreeing, and 44.1% disagreeing or strongly disagreeing. In the researcher’s opinion, the strength of the respondent’s perceived ease of use of technology in general is significant in that perceived ease of use has been shown in the literature to be a determinant of an individual’s acceptance of technology.

**Data on facilitating conditions.** Tables 9 through 13 show the respondents’ perceptions related to the facilitating conditions of participating in the system selection process, of being provided training, and of having resources to support them when they encountered difficulties in using the system.

Table 9 depicts the respondents’ perception that their department was included in the decision making process of recommending features for new technologies used to provide student services.
Table 9

Departmental Participation in the Decision-Making Process

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Disagree</td>
<td>15</td>
<td>7.3</td>
</tr>
<tr>
<td>Disagree</td>
<td>33</td>
<td>16.1</td>
</tr>
<tr>
<td>Agree</td>
<td>75</td>
<td>36.6</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>72</td>
<td>35.1</td>
</tr>
<tr>
<td>Not Applicable/Do Not Know</td>
<td>10</td>
<td>4.9</td>
</tr>
<tr>
<td>Total</td>
<td>205</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 9 shows that of 205 respondents 71.7% felt that their department had been included in the decision making process for recommending features to be included in new technologies used for student services.

Table 10 depicts the respondents perception that they personally were included in the decision making process of recommending features for new technologies.
Table 10

Individual Participation in the Decision-Making Process

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Disagree</td>
<td>21</td>
<td>10.2</td>
</tr>
<tr>
<td>Disagree</td>
<td>34</td>
<td>16.6</td>
</tr>
<tr>
<td>Agree</td>
<td>73</td>
<td>35.6</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>65</td>
<td>31.7</td>
</tr>
<tr>
<td>Not Applicable/Do Not Know</td>
<td>12</td>
<td>5.9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>205</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Table 10 shows that of 205 respondents 67.3% perceived that they individually had been included in the decision making process for recommending features to be included in new technologies used for student services.

Table 11 depicts the respondent’s perception that they were included and were able to provide feedback during the technology development process.
Table 11

Provided Feedback During Technology Development

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Disagree</td>
<td>13</td>
<td>6.4</td>
</tr>
<tr>
<td>Disagree</td>
<td>31</td>
<td>15.2</td>
</tr>
<tr>
<td>Agree</td>
<td>92</td>
<td>45.1</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>58</td>
<td>28.4</td>
</tr>
<tr>
<td>Not Applicable/Do Not Know</td>
<td>10</td>
<td>4.9</td>
</tr>
<tr>
<td>Total</td>
<td>204</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 11 shows that of 204 respondents to the survey, 73.5% perceived that they were able to provide feedback concerning the technology being developed to deliver student services.

Table 12 portrays the respondent’s perception that training, in the form of specialized instruction, was available to them.
Table 12

Availability of Training in the Form of Specialized Instruction

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Disagree</td>
<td>7</td>
<td>3.4</td>
</tr>
<tr>
<td>Disagree</td>
<td>41</td>
<td>20.1</td>
</tr>
<tr>
<td>Agree</td>
<td>92</td>
<td>45.1</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>49</td>
<td>24.0</td>
</tr>
<tr>
<td>Not Applicable/Do Not Know</td>
<td>15</td>
<td>7.4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>204</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Table 12 displays that for the 204 respondents 69.1% indicated that specialized instruction was available to them, and 23.5% of the respondents indicated that they did not have support in the form of specialized instruction.

Table 13 portrays the availability of support for the respondent in the form of a specific individual, or group, when they encountered difficulties in using the system.
Table 13

Support from Individuals or Groups when Encountering Difficulties

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Disagree</td>
<td>6</td>
<td>3.0</td>
</tr>
<tr>
<td>Disagree</td>
<td>25</td>
<td>12.3</td>
</tr>
<tr>
<td>Agree</td>
<td>102</td>
<td>50.2</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>59</td>
<td>29.1</td>
</tr>
<tr>
<td>Not Applicable/Do Not Know</td>
<td>11</td>
<td>5.4</td>
</tr>
<tr>
<td>Total</td>
<td>203</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 13 displays that for the 203 respondents 79.3% of them had support from an individual or a group if they had difficulties in using the system, and that 15.3% of the respondents did not have this type of support.

The data regarding facilitating conditions revealed in Tables 9 through 11 showed that 67.3% of respondents participated directly, and 71.7% participated through a departmental representative, in the system selection process and 77.7% of respondents were able to provide feedback. The data regarding the facilitating condition of training in Table 12 showed 69.1% perceived training was available, and data regarding system support in Table 13 revealed 79.3% perceived they had support if they encountered difficulties in using the system.
**Data on the factor of social influence and subjective norms.** Tables 14 through 17 portray data on the respondents’ perception of how others may influence their view of the system. These tables capture data concerning social influence and social norm.

Table 14 shows the perception that the respondents had the support of administrators and managers for using technology to provide student services.

**Table 14**
Support of Administrators for the Use of Student Services Technology

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Disagree</td>
<td>6</td>
<td>2.9</td>
</tr>
<tr>
<td>Disagree</td>
<td>11</td>
<td>5.5</td>
</tr>
<tr>
<td>Agree</td>
<td>88</td>
<td>43.1</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>98</td>
<td>48.0</td>
</tr>
<tr>
<td>Not Applicable/Do Not Know</td>
<td>1</td>
<td>0.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>204</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 14 shows of 204 respondents to the statement that administrators and managers were supportive in the use of student services technology that 91.1% agreed or strongly agreed with the statement.

Table 15 shows of the perception that the respondents had the support of the college community for using technology to provide student services.
### Table 15

Support of the College Community for the Use of Student Services Technology

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Disagree</td>
<td>4</td>
<td>2.0</td>
</tr>
<tr>
<td>Disagree</td>
<td>12</td>
<td>5.9</td>
</tr>
<tr>
<td>Agree</td>
<td>101</td>
<td>49.5</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>80</td>
<td>39.2</td>
</tr>
<tr>
<td>Not Applicable/Do Not Know</td>
<td>7</td>
<td>3.4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>204</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Table 15 shows of 204 respondents to the statement that their college community was supportive in the use of student services technology that 88.7% agreed or strongly agreed with the statement.

Table 16 shows the perception that the respondents believed that managers and supervisors at their college expected them to use technology to provide student services.
Table 16

Perception that Managers Expected the Use of Student Services Technology

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Disagree</td>
<td>2</td>
<td>1.0</td>
</tr>
<tr>
<td>Disagree</td>
<td>4</td>
<td>2.0</td>
</tr>
<tr>
<td>Agree</td>
<td>66</td>
<td>32.4</td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>129</td>
<td>63.1</td>
</tr>
<tr>
<td>Not Applicable/Do Not Know</td>
<td>3</td>
<td>1.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>204</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 16 shows that 95.5% of the 204 respondents believed that the managers and supervisors at their college expected them to use technology to help provide services to students.

Table 17 shows of the perception of the respondents that their colleagues would be willing to use the system.
Table 17

Respondents’ Perception of Colleagues’ Willingness to Use the System

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Will not use</td>
<td>3</td>
<td>1.5</td>
</tr>
<tr>
<td>Will use Occasionally</td>
<td>37</td>
<td>18.2</td>
</tr>
<tr>
<td>Will use Often</td>
<td>75</td>
<td>36.9</td>
</tr>
<tr>
<td>Will use as much as possible</td>
<td>73</td>
<td>36.0</td>
</tr>
<tr>
<td>Not Applicable / Do Not Know</td>
<td>15</td>
<td>7.4</td>
</tr>
<tr>
<td>Total</td>
<td>203</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 17 reveals a perception by the respondents that 36% of their colleagues would be willing to use the system as much as possible, and they believed that 36.9% of their colleagues would be willing to use the system often. They believed that 19.7% of their colleagues would not use the system or would only use it occasionally.

Table 18 portrays the intention and willingness of respondents to use a system to help them interact with students.
Table 18

Willingness to Use the System to Help Interact With Students

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Will not use</td>
<td>2</td>
<td>1.0</td>
</tr>
<tr>
<td>Will use Occasionally</td>
<td>12</td>
<td>5.9</td>
</tr>
<tr>
<td>Will use Often</td>
<td>34</td>
<td>16.8</td>
</tr>
<tr>
<td>Will use as much as possible</td>
<td>141</td>
<td>69.8</td>
</tr>
<tr>
<td>Not Applicable/Do Not Know</td>
<td>13</td>
<td>6.5</td>
</tr>
<tr>
<td>Total</td>
<td>202</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 18 shows that 69.8% of the respondents would be willing to use the system as much as possible to help them interact with students, and an additional they 16.8% of would be willing to use the system often. Only 6.9% of the respondents would not use the system or would only use it occasionally.

**Student Services Which Should be Offered Using Technology**

Table 19 shows that for the student services required as part of the matriculation process the belief of student services personnel that these services should be offered through a technology enabled solution.
Table 19

Student Services Which Should be Offered Through Technology

<table>
<thead>
<tr>
<th>Student Service</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Orientation</td>
<td>Count</td>
<td>2</td>
<td>16</td>
<td>78</td>
<td>103</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>1.0</td>
<td>8.0</td>
<td>39.2</td>
<td>51.8</td>
</tr>
<tr>
<td>Career Planning</td>
<td>Count</td>
<td>4</td>
<td>18</td>
<td>102</td>
<td>75</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>2.0</td>
<td>9.0</td>
<td>51.3</td>
<td>37.7</td>
</tr>
<tr>
<td>Educational Plan</td>
<td>Count</td>
<td>5</td>
<td>12</td>
<td>88</td>
<td>94</td>
</tr>
<tr>
<td>Abbreviated</td>
<td>%</td>
<td>2.5</td>
<td>6.0</td>
<td>44.2</td>
<td>47.2</td>
</tr>
<tr>
<td>Educational Plan</td>
<td>Count</td>
<td>13</td>
<td>37</td>
<td>79</td>
<td>70</td>
</tr>
<tr>
<td>Comprehensive</td>
<td>%</td>
<td>6.5</td>
<td>18.6</td>
<td>39.7</td>
<td>35.2</td>
</tr>
<tr>
<td>Referrals to Support Services</td>
<td>Count</td>
<td>4</td>
<td>10</td>
<td>111</td>
<td>73</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>2.0</td>
<td>5.1</td>
<td>56.1</td>
<td>36.9</td>
</tr>
<tr>
<td>Assessment</td>
<td>Count</td>
<td>2</td>
<td>7</td>
<td>89</td>
<td>98</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>1.0</td>
<td>3.6</td>
<td>45.4</td>
<td>50.0</td>
</tr>
</tbody>
</table>

Table 19 shows strong support for offering certain services through a technology enabled solution, with 91% supporting online orientation, 89% with for Career Planning, 91.4% for abbreviated educational plans, 93% for referrals to support services, and 95.4% supporting technology for assessment. The use of technology enabled solutions for comprehensive educational plans was supported, but at 74.9% the support was lower than the other services.

**Student Services Currently Being Delivered Using Technology**

Table 20 shows for those student services that are required as part of the matriculation process those that are being delivered using technology, or have plans to be delivered using technology in the next six months, at the respondent’s institution.
Table 20 shows that 92.5% of the institutions to which the respondents belonged deliver, or will deliver in the next six months, an initial orientation using technology.

Technology is being used to deliver assessment at 78.4% of the respondents’ institutions, and for delivery of abbreviated educational plans at 76.5% of institutions. For career planning only 41% of the respondents stated their institution used technology to deliver the service, and 27% stated they did not know. For career planning, only 41% of the respondents stated their institution used technology to deliver the service, and 27% stated they did not know. This was similar to referrals to support services where 47% of the respondents stated their institution used technology to deliver the service, and 25% stated they did not know.
Summary of Findings

The following section provides a summary of the data presented in the findings above, organized according to the three main research questions: (a) factors that influence the acceptance of technology by student services personnel, (b) the exploratory research question regarding student success services that student services personnel believe can be offered through a technology enabled solution, and (c) exploratory research regarding student success services that are currently being delivered through technology at community colleges in California.

Summary of Factors Influencing the Acceptance of Technology

This section provides a summary of the data collected in relation to the research question on the predictors and facilitating conditions that influence the acceptance of technology by student services personnel, and is presented in four groupings related to (a) perceived usefulness; (b) perceived ease of use; (c) facilitating conditions of user participation in selecting the system, training, and system support; and (d) the factor of subjective norm and social influence.

Perceived usefulness. The survey presented four items related to the usefulness of technology, firstly usefulness helping provide services to students, secondly usefulness in accomplishing tasks more quickly, thirdly usefulness in increasing the efficiency of time spent with students, and lastly usefulness in improving the quality of their work. All four aspects of usefulness were supported by the respondents, with 98% agreeing that technology is useful in helping them provide services to students, 94.1% that it is useful
in helping them accomplish tasks more quickly, with 84.9% that it is useful in increasing the efficiency of their time with students, and 89.7% agreeing it helps improve the quality of their work with students. The perception of the usefulness of technology was strongly supported by the respondents of the survey.

The data showed high consistency among these survey items in the percentage of respondents who agree and who strongly agreed with two minor exceptions. Firstly, on the perception that technology provided greater efficiency in their time with students, the data showed more respondents, at 7.3%, answering that this statement did not apply to them or that they did not know. This may be because individuals in certain positions, such as vice presidents, may not be using technology to interact directly with students on a regular basis. Secondly, the percentage that strongly agreed in perceived usefulness as it related to increasing the quality of work at 56.5% was a substantially lower percentage than those who stated they strongly agreed with other survey items related to usefulness.

**Perceived ease of use.** The survey presented three items related to the ease of use of technology: (a) that in general new technology is easy to use, (b) that it is easy to become adept at using new technology is student services work, and (c) that it is easy for student services personnel to get their student services system to do what they want it to do.

The survey revealed a strong perception in the ease of use of new technology in general, with 88.2% of respondents in agreement. Additionally 85.7% supported the perception that it was easy for them to become adept at using new technology in their
student services work. The survey did not support the perception that student services personnel found it easy to get the student services system to execute the tasks they wanted to perform. Only 51.5% of respondents agreed it was easy to get the system to perform their tasks, while 44.2% disagreed. Because detailed information was not solicited in the survey regarding this item it was challenging to understand why the perceived ease of use of their student services system differed substantially from the perceived ease of use of technology in general, or in their student services work. It is significant because ease of use has been shown to be a predictor of the acceptance of technology, and would indicate that while student services professionals are willing to adopt new technologies for certain purposes they may be resistant to accepting their student services system because they do not find it easy to use.

**Facilitating conditions.** Facilitating conditions, according to Venkatesh et al.’s (2003) UTAUT theory also influence the acceptance of technology, and this study focused on the three facilitating conditions of (a) inclusion and guidance during the system selection and development process, (b) training or specialized instruction, and (c) support when encountering system difficulties.

**Facilitating condition of inclusion in system selection.** The survey had three items related to this facilitating condition: (a) was their department represented during the decision making process, (b) did they individually participate in the decision-making process, and (c) were they able to provide feedback during the technology development process. The majority of respondents had participation in the system selection process,
either individually, at 67.3%, or through departmental representation at 71.7%. When asked if they were able to provide feedback during the development process the number of respondents who agreed was at 73.5%. For all three survey items the number of individuals who stated that they were not included was consistently in the 21% to 26% range, which could indicate a certain percentage of individuals perceived they were entirely excluded from participation in the system selection and development process.

**Facilitating condition of training.** The majority of participants in the study agreed that specialized instruction concerning the system available to them, but as with other facilitating conditions there were a number of respondents, 23.5%, who did not believe that training was available to them.

**Facilitating condition of support.** The majority of participants in the study, at 79.3%, agreed that support was available to them, either from an individual or from a group, when they encountered difficulties in using the system.

The survey revealed that facilitating conditions were perceived to be present for most of the respondents. It also appeared that for the facilitating conditions of inclusion in the system selection and development process and for the availability of training, consistently between 21% to 26% of users did not perceive the availability of these facilitating conditions. If these were individuals at the same institution this could indicate that certain institutions lack a practice of inclusion, training and support.

**Subjective norm and social influence.** Subjective norm, also referred to as social influence, is an additional predictor in the acceptance of technology, and is defined
as the perception that other individuals who are important to the user believe they should use the system. This includes their perception of their support from management, administration in general, and the college community as a whole. It also includes the perception that their colleagues and peers use the system. The survey revealed that the aspect of social influence was present for most of the respondents, with 88.7% perceiving they had support from their college community and 91.1% had the support of their managers and administrators for the use of technology for student services. In addition, 95.5% stated that they perceived their managers expected them to use student services technology. Many of the respondents, 69.8%, stated they were willing to use the system as much as possible to help them interact with students. There was a great difference between their willingness to use the system at 69.8% and their perception that their colleagues were willing to use the system, at only 36%. It appears for student services personnel in California community colleges that the belief that their colleagues will not use the system does not influence their intention to use technology for student services.

**Student Services Which Should Be Offered Using Technology**

This section provides a summary of the data collected in relation to the exploratory research question on the services which student services personnel believe can be offered through a technology enabled solution. Strong support was shown for the use of technology for delivering initial orientation, assessment, abbreviated educational plans, career planning and referrals to support services, with 89% or more of the respondents believing these should be offered through the use of technology.
Approximately 75% of the respondents believed that comprehensive educational plans should be offered through a technology enabled solution.

**Summary of Services Currently Being Offered Through Technology**

This section provides a summary of the data collected in relation to the exploratory research question on the services currently being offered by colleges through a technology enabled solution. The three services that the largest number of respondents stated were offered through technology at their institution were initial online orientation at 92.5%, assessment at 78.4%, and abbreviated educational plans at 76.5%. Comprehensive educational plans were also offered through technology at 67.3% of the respondents institutions. The majority of respondents at 57%% either did not know or did not believe that their institutions were offering career planning services through technology. This was similar to the use of technology for referral to support services, where 53% of the respondents either did not know or did not believe that their institutions were offering the service through technology.

**Data Conclusion**

This chapter presented an introduction to the survey including procedures and timelines used to collect the data, followed by a presentation of the data. The presentation of the data was organized according to the research questions. The data on the research question on the primary factors that influence the acceptance of technology was grouped according to the factors of perceived usefulness; perceived ease of use; the
facilitating conditions of inclusion in system development, training, and system support; and, lastly, the factor of social influence and subjective norm. A summary of the findings was provided at the end of the presentation of the data.

In general, the results of the data showed that the factors which influence the acceptance of technology were perceived to be present by student services personnel in California’s community colleges. One notable difference was in the factor of subjective norm, where the perception that their colleagues were not as willing to use the system did not appear to influence their own willingness to use the system.
Chapter 5
SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The purpose of this study was to identify the predictors and facilitating conditions which influence the acceptance of technology by student services personnel in California community colleges. It also sought to explore which student services they believe can be offered through a technology enabled solution, as well as those which are currently being offered through technology. The study addressed the following research questions:

1. What are the primary factors which influence the willingness of student services personnel at community colleges in California to adopt new technologies for the delivery of services to students?

2. Of the various student services required as part of matriculation, which of these services do student services personnel believe can be offered through a technology enabled solution?

3. Of the various student services required as part of matriculation which of these services are currently being delivered through technology at community colleges in California?

The study was developed based upon a thorough review of the literature. The methodology used to perform the study, including identifying the population to be sampled and the development of the survey instrument to be used to collect data for
quantitative analysis, were presented. The data collected from the respondents and the findings as they related to the research questions were presented in the previous chapter.

**Conclusion**

The purpose of this study was to identify the predictors and facilitating conditions which influence the acceptance of technology by student services personnel in California community colleges. A review of the literature showed an increasing use of technology for student services, and also provided a set of predictors and facilitating conditions which indicated the intention to use technology in various settings, including educational environments. The researcher sought to explore the factors of technology acceptance in the California community college environment from the perception of student services personnel in order to provide information to administrators who seek to leverage the use of technology for student services.

**Research Question One: What are the primary factors which influence the willingness of student services personnel at community colleges in California to adopt new technologies for the delivery of services to students?**

**Perceived usefulness.** Research has shown that perceived usefulness and perceived ease of use are predictors of technology acceptance. Student services personnel believe that technology is useful in their jobs, and helps increase the efficiency of their time with students. They also believe that technology is useful in delivering services to students. Establishing practices that continually explore the usefulness of
technology for the delivery of student services will increase the acceptance and usage rates of technology for these purposes.

**Perceived ease of use.** If, in addition to being useful, a technology is also easy to use, then student services personnel will use that technology in the delivery of services to students. Student services personnel in general find it easy to use technology, and are adept at picking up new technologies for student services. However, a substantial portion of them believed that their own student services system was not easy to use. This may be caused by the system having important information in multiple places, or having to click the mouse button multiple times to accomplish a single task. Discovering the underlying reasons for this belief will be beneficial for identifying solutions that will make student services system easier to use.

**Subjective norm.** Social influence and subjective norm play a role in the acceptance of technology by student services personnel. Environments where administrators and the college community are encouraging the use of technology favor increased acceptance and usage. These environmental factors should be included when planning for technology initiatives for the delivery of student services. The influence of usefulness and ease of use are greater than social norm, as many student services personnel are willing to accept technology with these characteristics even if they perceive that their peers are not willing to use the same technology.

**Facilitating conditions.** Facilitating conditions are important to consider if higher rates of technology acceptance are going to be achieved for the delivery of student
services in California’s community colleges. Technology initiatives create organizational change, and how this change is managed has an impact on personnel and on their acceptance of technology. Inclusion in system selection and development, the availability of training and professional development, and having continued support are three key components of technology initiatives known to increase the acceptance of technology when it is deployed.

**Training and professional development.** Training and plans for professional development related to the technology should be included as components of student services technology initiatives. Training materials containing a comprehensive view of the available features provide a foundation for initial familiarity with the technology. Supplemental training materials that focus on specialized functions, particularly those that are most frequently used, are beneficial. Community colleges can use multiple modes for training and professional development, providing in person instruction during initial implementation, and offering professional development through online educational technologies such as Learning Management Systems to new or part-time staff. Online professional development is also beneficial for highlighting improvements, refreshing knowledge of existing features, and reaching individuals who are located remotely and in person instruction is not easily available.

**Support when encountering difficulties.** Defining structures that provide support for users when they encounter difficulties in using the technology is a key component to technology planning. The support structures can be either from individuals or from
groups who are available to answer questions or assist users when the encounter difficulties in using the system. For technologies being deployed to a large group of individuals having one user specially trained and identified as an expert can be beneficial. In larger organizations creating environments that encourage peer to peer support should also be considered.

In order to increase acceptance of technologies for use in delivering services to students by student services professionals, administrators in California’s Community Colleges should include in their initiatives structures that promote inclusion of users early in the process, identify the technologies usefulness, and focus on aspects that make it easy to use. Professional development and training should be included in technology initiatives, and clear support structures identified. Technology initiatives which include these factors in their institutional processes and in their planning for individual technology projects will see a higher rate of acceptance by users involved in these initiatives.

**Research Question Two:** Of the various student services required as part of matriculation, which of these services do student services personnel believe can be offered through a technology enabled solution?

Student services personnel believe technology can be used to deliver many of the services for student success. Strong support was shown for the use of technology in delivering initial orientation, assessment, abbreviated educational plans, comprehensive educational plans, career planning and referrals to support services. College
administrators and staff will find a favorable environment in exploring technologies used for offering these services.

**Research Question Three: Of the various student services required as part of matriculation, which of these services are currently being delivered through technology at community colleges in California?**

Many of California’s community colleges are currently using technology to offer initial online orientation, assessment and abbreviated educational plans. The use of technology for comprehensive educational plans is also common, though not as widespread. Not as many colleges are using technology for career planning services or for referral to support services, and there appears to the potential to expand the use of technology into these areas.

**Inclusion in system selection and development.** Inclusion of users during the early stages of a technology initiative is important for future acceptance. Community colleges should create structures at the beginning of technology initiatives which support inclusion of users early in the process. Inclusion does not necessarily require direct individual participation, but can be accomplished through user representation, provided the representatives maintain good communication with their colleagues. Collaborative, inclusionary structures which start early, and continue on through system selection, development, and implementation increase a technologies acceptance when it is deployed.
**Recommendations**

The purpose of this study was to identify the predictors and facilitating conditions which influence the acceptance of technology by student services personnel in California community colleges. Student services personnel do not find their student services systems easy to use, and understanding the particular difficulties they encounter could lead to recommended changes on making the system easier for them. Many colleges are using vendor supplied systems, and if there are common challenges being encountered by individuals using the same system at different colleges, then a collective effort in communicating them collectively to the vendor may prove effectual for change.

As technology becomes more prevalent in delivering student services, the inclusion of student services professionals in the early stages of a technology initiative, and especially during system selection and development, will be impact the acceptance and usage when it is implemented. Inclusion through representation is a feasible method to extend the participation to more individuals, and reduce the number of student services personnel that perceive themselves as being excluded from the process. Representation is effectual when paired with communication mechanisms that provide for input from student services professionals, as well communicating to them decisions made by committees and working groups.

With the continued expansion of technology for student services comes the need to create new professional development programs for faculty and staff involved with, and impacted by, the deployment of the new technologies. State legislation is currently being
proposed to extend the opportunity for professional development within the community colleges to all staff, and to increase the amount of time provided for professional development opportunities. The creation of a statewide professional development program related to student services technology would be effectual in increasing the acceptance and usage of new technologies as they are implemented. A program that provides multiple modes of delivery, including in person and online components, could extend the reach and timeliness of information to more individuals.

Although many community colleges within the state are using technology for initial student education plans, the results of this study indicated less support by student services professionals for technology used in creating comprehensive student educational plans. This may be reflective of the complex nature of educational planning for transfer students, and challenges in representing and communicating requirements from three different segments comprised of nine University of California colleges, 23 colleges in the California State University System, and 112 colleges in the California Community College System. Legislation that has mandated the creation of degrees that facilitate transfers between the California Community Colleges and the California State University systems has simplified some of the complexities, and similar transfer degrees extended to the University of California would provide greater benefit to transfer students and allow for greater use of technology in educational planning.

Career exploration and career planning services are important in assisting student in the decision making of declaring their major and their field of study. Further research
should be performed to determine why technology is underutilized for career exploration and career planning services, and to determine the viability to expand technology into these areas.

Lastly, this study did not explore the usefulness of technologies in support of student engagement and retention. As technology has evolved over the last decade it has made it easier for anyone who has technology to connect with more individuals over greater distances. Colleges would benefit from additional research into the potential for technology to be used to increase the engagement of students, either with their peers or with student services professionals. Using technology to create additional, meaningful connections, outside the classroom and beyond the faculty-student relationship, may positively impact retention.

The availability of support services is critical to the success of students in California community colleges. With a large student population and a limited number of student services professionals, colleges can benefit by allocating financial resources on technology initiatives which will be adopted and used. Technology acceptance in the California community colleges environment is increased in environments that foster inclusiveness, promote collaboration and support professional development. Strong partnerships between Student Services and Information Technology are critical to building bridges to support technology initiatives that foster student development and retention, and which further the student success agenda.
APPENDICES
My name is Kevin Flash, and I am an Applications Manager in the Los Rios Community College District. I would like you to participate in a survey I am conducting as part of my studies in the Educational Leadership Program, a master’s program at the California State University Sacramento. The survey is to gain an understanding of the perceptions that student services personnel have on the technology used to provide student services in California Community Colleges. You were selected to participate in this research because you have subscribed to a list serve hosted by the California Community Colleges related to student services. At a time when there are increased expectations on the use of technology for student services your participation in this survey is appreciated and valued.

Your participation in this study is voluntary. The survey takes about 10 minutes to complete, and is completely confidential. If you would like to participate, simply click on the link below and you will be provided with a consent form. After providing your consent, you will be directed to the survey.

If you have any questions about the survey please feel free to contact me at (530) 400-9315, or by email at flashk@csus.edu.

To proceed to the survey click here: https://www.surveymonkey.com/s/Studentservicestechnologysurvey

Thank you,
Kevin Flash
Hello,

My name is Kevin Flash, and I am an Applications Manager in the Los Rios Community College District. A couple weeks ago I sent you an invitation to participate in a survey I am conducting as part of my studies in the Educational Leadership Program, a master’s program at the California State University Sacramento.

If you completed the survey, I would like to thank you for taking your time and providing me with information which will be useful in my research.

If you have not already taken the survey, I would appreciate your time in filling it out and providing me with your perspective.

To proceed to the survey click here:
https://www.surveymonkey.com/s/Studentservicesteachnologysurvey

The survey is to gain an understanding of the perceptions that student services personnel have on the technology used to provide student services in California Community Colleges. You were selected to participate in this research because you have subscribed to a list serve hosted by the California Community Colleges related to student services. At a time when there are increased expectations on the use of technology for student services, your participation in this survey is appreciated and valued.

Please click on the above address to go directly to the survey. If that does not work, copy and paste this address into the address bar of your internet Browser.

Your participation in this survey is voluntary. The survey takes about 10 minutes to complete and is completely confidential. Your completion of the survey indicates your consent to participate in the study. If you have any questions about the survey, please feel free to contact me at (530) 400-9315 or by email at flashk@csus.edu.

Thank you,

Kevin Flash
APPENDIX C

Survey

Student Services Technology Survey

Welcome

Welcome to a survey on the perceptions of student services personnel on the use of technology for student services. The results of this survey will help us understand the perceptions of campus technology in California Community Colleges.

If you have questions about the survey, please contact Kevin Flash at [Contact Information]

Thank you for your participation.

Completing the Survey

• Click on each response after you read each question.
• Please complete it in one sitting.
• To review a question, you may scroll back to that question.
• Click "Exit this survey" if you do not want to complete the survey.
• Click "Next" to skip any item that does not apply to you or to continue with the survey.
Student Services Technology Survey

Consent to Participate in Research

You are being asked to participate in research which will be conducted by Kevin Flash, a graduate student in the Higher Education Leadership and Policy Studies program at California State University, Sacramento. The purpose of the study is to research factors which influence the acceptance of technology by student service professionals in California Community Colleges. This information is important because of the increased rate at which technology is being developed for use in the delivery of student services.

You are asked to complete a questionnaire about your perception of new technology systems in your workplace, including their usefulness, how easy they are for you to use, the influence of other individuals, and conditions which facilitate your use of new technology. Most respondents can complete this questionnaire in about 10 minutes, although individual progress varies by how quickly you move through the questions.

There is minimal to no risk associated with participation in this study. However, there could be questions that you are uncomfortable answering or to which you would simply prefer not to respond. Your participation in this survey is strictly voluntary, and you will be under no obligation whatsoever to answer any questions that you are not inclined to answer. You may choose not to answer any questions you do not want to answer and still remain in the study.

You may not personally benefit from your participation in this research. It is hoped that the results of this research will benefit colleges by identifying factors that influence technology acceptance by staff.

No personal identifying information will be collected for this survey. Your responses will be kept confidential to the degree permitted by the technology used. However, no absolute guarantees can be given for the confidentiality of electronic data. All responses will be kept in a password-protected SurveyMonkey account until they are destroyed at the end of the study. Responses will not be reported individually, instead, all response data will be aggregated for analysis.

You will not receive any compensation for participating in this study.

Your participation in this survey is entirely voluntary. If you volunteer to complete this survey, you may decide not to complete the survey for any reason at any time without consequence of any kind. Your completion of the web based survey indicates your consent to participate in the study.

If you have any questions about this research you may contact Kevin Flash at [masked] or by email at [masked]
Student Services Technology Survey

Technology and Student Services Survey

This survey is being used to gather information on the perceptions of student services professionals on the use of technology. For the purposes of this survey technology or technology systems refer to the computer systems your college uses to provide student services.

1. We are interested in what area of student services you currently work. Please select the one that is most applicable to your current position at the college where you are currently employed.

- [ ] Vice President
- [ ] Dean
- [ ] Supervisor
- [ ] Classified Staff
- [ ] Faculty - Counselor
- [ ] Faculty - Instructor

Other (please specify):
## Student Services Technology Survey

### Your Experience with Technology

Thinking about your experience using technology at your college, and your use of technology in providing services to students, please select one response for each item listed below to evaluate your agreement with each of the following technology statements. If you are not familiar or do not know, please select Not Applicable / Don’t Know.

2. Thinking about technology, please select one response for each item listed below to evaluate your agreement with the statement regarding how useful you find it in your current work environment, and how easy it is for you to use.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>Not Applicable/Don’t Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology is useful in helping me provide services to students</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Technology helps me accomplish student services tasks more quickly</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Technology increases the efficiency of my time interacting with students</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Technology helps increase the quality of my student services work</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>In general, I find new technologies easy to use</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>I have found it easy for me to become adept at using new technology in my student services work</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>It is easy to get the student services system to do what I want it to do</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>
**Student Services Technology Survey**

3. Thinking about your experience in using a technology recently implemented at your college, please select one response for each item listed below to evaluate your agreement with the statement regarding your involvement in the decision making process, and the support you are provided in using the technology.

<table>
<thead>
<tr>
<th>Item</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>Not Applicable/Don't Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>My department was included in the decision making process used in recommending features for new technology used to provide student services</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I was included in the decision making process used in recommending features for new technology used to provide student services</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I was able to provide feedback during the development of the technology used to provide student services</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specialized instruction concerning the system was available to me</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A specific person (or group) is available for assistance with system difficulties</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The system is not compatible with other systems I use</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. Thinking about your willingness to use the system ....

<table>
<thead>
<tr>
<th>How willing are you to use the system to help you interact with students?</th>
<th>Will Not Use</th>
<th>Will Use Occasionally</th>
<th>Will Use Often</th>
<th>Will Use As Much as Possible</th>
<th>Not Applicable/Don't Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>How willing are your colleagues to use the system to help in their interaction with students?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5. Thinking about the expectations and support of others in your use of the system ...

<table>
<thead>
<tr>
<th>Item</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>Not Applicable/Don't Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrators and management of the institution have been supportive in the use of student services technology</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The college community has been supportive in the use of student services technology</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Managers and supervisors at the college expect me to use technology to help provide student services</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


### Student Services Technology Survey

#### Potential Use of Technology for Student Services

Thinking about the potential use of technology to provide services to students, please select one response for each item listed below. If you are not familiar or do not know, please select Not Applicable / Don't Know.

**6. The following services should be offered through a technology enabled solution**

<table>
<thead>
<tr>
<th>Service</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial College Orientation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Career Planning</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educational Planning - abbreviated plans</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educational Planning - comprehensive plans</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Referrals to support services</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assessment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**7. Which of the following services are being delivered-- or are planned to be delivered in the next 6 months-- using technology at your institution?**

<table>
<thead>
<tr>
<th>Service</th>
<th>Yes/Planned</th>
<th>No</th>
<th>Don't Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial College Orientation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Career Planning</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educational Planning - abbreviated plans</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educational Planning - comprehensive plans</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Referrals to support services</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assessment</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**8. How are the following student services are being delivered at your institution? (Select all that apply)**

<table>
<thead>
<tr>
<th>Service</th>
<th>In Person</th>
<th>In Groups</th>
<th>Technology Only</th>
<th>Technology with self-service</th>
<th>Personal Support</th>
<th>Don't Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial College Orientation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Career Planning</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educational Planning - abbreviated plans</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educational Planning - comprehensive plans</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Referrals to support services</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assessment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Student Services Technology Survey

9. What types of data does your college collect on the utilization of technology to provide services to students. For the following question “delivery method” refers to how the service is provided: in person or through technology.

<table>
<thead>
<tr>
<th>Metric</th>
<th>Yes</th>
<th>No</th>
<th>Don't Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of students served</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of students served by delivery method</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student satisfaction with delivery method</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

10. How many years have you worked at the college level?

- 1-5
- 6-12
- 13-20
- 21-29
- 30+

11. My age is:

- 21-24
- 25-29
- 30-39
- 40-49
- 50-59
- 60+

12. My ethnicity is:

- African American
- Asian
- Latino
- Native American
- White
- Multi-Race

13. My gender is:

- Male
- Female
REFERENCES


Ludwig-Hardman, S., & Dunlap, J. C. (2003). Learner support services for online students: Scaffolding for success. *International Review of Research in Open and Distance Learning, 4*(1).


The Student Success Act, SB 1456, Title 5 (2012).


