Examining the Effectiveness of Student Authentication and
Authenticity in Online Learning at Community Colleges

A dissertation submitted in partial fulfillment of the requirements
for the Doctor of Education Degree in Educational Leadership

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Dedication

This dissertation is dedicated to my children, Rose and Rod, and to my mother.
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Abstract

Examining the Effectiveness of Student Authentication and Authenticity in Online Learning at Community Colleges

by

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Doctor of Education Degree

In Educational Leadership

Although online learning is now more accepted as a dependable form of instruction, as it expands, some doubts about the issue of student authentication (the process of determining whether someone or something is, in fact, who or what it is declared to be) and student authenticity (the implementation of activities and assessment strategies, which require the learner to apply the knowledge learned by using higher order thinking skills) remain as major challenges for the educational community. The physical disconnection between instructor and students in an online environment requires that educational institutions take different steps to ensure an authentic learning environment.

Hence, this study explored how institutional policies and practices, professional development and training, and technology support services are fundamental to the effectiveness of student authentication and authenticity in online learning.

This study used a quantitative approach to answer research questions. The sample population for this research was comprised of online faculty from California community colleges. The data was collected through an online survey, which was based on anonymous self-reporting.
During the data analysis phase, three themes emerged. The first theme that emerged was that faculty members were highly aware of the existence of substitute course takers. The second theme that became apparent was that there was a lack of faculty satisfaction in institutional policies and practices, professional development and training, and technology support services at California community colleges. The final theme that was identified revealed that the demographic characteristics of faculty members were related to their awareness of the effectiveness of student authentication and authenticity.

Keywords: online education, student authentication, student authenticity, academic honesty, academic integrity
Chapter I: Statement of the Problem

Introduction

As online learning is rapidly becoming one of the most prevalent delivery methods of learning in institutions of higher education and it appeals to a wide variety of students, educators need to be aware of the quality of online student assessment (Rowe, 2004). Community college students with an average age of twenty-eight, and eighty percent of whom are employed full or part-time generally have economic responsibilities for themselves and/or a family (American Association of Community Colleges, 2011). Due to these responsibilities and work schedules, online learning provides an alternative method for students to improve their skills, and to keep or upgrade their employment. Historically, online learning allows students to take classes more often at their convenience (Lever-McDuffy, Johnson, & Lemke, 1996). Community colleges have been investigating new technologies that are available for those students who cannot attend onsite classes for numerous reasons: declining enrollment, reduced resources, remaining competitive with course offerings, and addressing the needs of students who cannot attend traditionally scheduled classes on campus (Lever-McDuffy et al., 1996). Although online instruction is considered a common component of most higher educational institutions, the current practices of online learning are not fully integrated into the institutions and support services (Compora, 2003).

Many institutions of higher education find it difficult to fully incorporate online learning (Dooley & Murphrey, 2000). Although some community college faculty members have embraced the new technology and are enthusiastic about teaching online education courses, many faculty members may not be motivated to teach online courses
and prefer traditional methods. Yet, faculty members must be deeply committed if an online education program is to be successful (Schifter, 2004). Faculty members are concerned that the quality of online education is not as effective as the quality of onsite courses. Some may express concern that reputable institutions will lose their credibility by offering online courses (Loane, 2001). Online programs may be viewed as “diploma mills or fraudulent institutions that offer worthless degrees, many requiring little or no coursework, in exchange for money” (Loane, 2001, para. 8). Although distance education has existed for more than a century in the form of correspondence courses, faculty perceptions about the value and quality of online-based instruction continue to be an issue. As online education sets its foothold in higher education, the very meaning of instruction, particularly at the community college level, is changing. A new learning paradigm is emerging in which the faculty role changes from traditional teacher to designer of interactive course materials and a guide for students (Dirr, 2003).

The Higher Education Opportunity Act of 2008 (HEOA) is an amendment and extension of the Federal Higher Education Act of 1965. It includes language related to verifying the identity of students in online education programs. Section 602.17 (Application of Accrediting Standards in Reaching an Accrediting Agency Decision) was amended by adding a new paragraph (part g) to implement the new student verification requirements. It says that accrediting agencies must require institutions offering online education to "have processes through which the institution establishes that the student who registers in an online education or correspondence education course or program is the same student who participates in and completes the program and receives the academic credit" (Higher Education Opportunity Act, 2007, p.248). On August 9, 2009,
the U.S. Department of Education included a Notice of Proposed Rulemaking (NPRM) detailing the proposed regulations for enforcing the verification provision set forth in the HEOA of 2008:

The agency would meet this requirement if it requires institutions to verify the identity of a student who participates in class or coursework by using methods such as a secure login and pass code or proctored examinations, and new or other technologies and practices that are effective in verifying student identity. The agency would also be required to make clear, in writing, that institutions must use processes that protect student privacy and must notify students at the time of registration or enrollment of any projected additional student charges associated with the verification of student identity. (p. 39505)

The traditional method of assessing quality in higher education is accreditation. Accrediting agencies have examined the issues associated with online education, and, after much controversy, debate, and uncertainty, have also developed specific guidelines for institutions to follow (Loane, 2001). The accrediting agencies determine whether an institution’s budgets and policies reflect its commitment to students (Council for Higher Education Accreditation, 2002). The Higher Education Opportunity Act of 2008 requires accrediting agencies to monitor the steps that colleges take to verify that a student who registers for a class is the student who actually takes the class and receives the grade. This is referred to as student authentication in an online class. Recent federal legislation requires colleges and universities with online learning programs to verify a student’s identity in order to ensure that the student enrolled is actually doing the work. The federal government relies on the accrediting agencies to help ensure the integrity of
“Accreditation agencies have an important role in the development and maintenance of
standards for postsecondary education and have gained considerable influence over
individual institutions and programs seeking to obtain or preserve the accreditation that
only these agencies may bestow” (p. 646).

As online courses are growing in popularity, more and more instructors are
becoming skeptical of whether or not the work submitted was actually completed by the
student who was enrolled. When a student reaches a high score on an online
examination, how much confidence does an instructor have that the student who took the
test is the student who is actually enrolled in class?

Kathleen S. Tighe (2011), the Inspector General of the U.S. Department of
Education, stated

Our investigative work continues to affirm the vulnerability of online education to
fraud. Since 2005, we have initiated 100 investigations of “fraud rings” targeting
online education programs at public, non-profit, and for-profit schools. Since we
first testified about this issue in October 2009, our case load in this area has more
than doubled. We are currently investigating 66 fraud ring cases. (p. 11)

Over one hundred student financial aid scams and cases of academic integrity violations
have been identified. Therefore, accreditation and federal oversight into higher education
has expanded. Besides, based on the most recent U.S. Department of Education
Inspector General (DOE IG) testimony, more regulations are expected to follow (Campus
Technology, 2011).
Hirner (2008) discussed that “educational policy groups, accrediting agencies, and academic institutions are all dealing with the new landscape of online education brought about by the delivery of courses and programs via the Internet” (p. 35). It is a challenging time of transition for teaching with technology, whether online, hybrid, and/or web enhanced classrooms. In addition to faculty involvement, administrators work with faculty members to develop plans and procedures for successful implementation of student protocols. The purpose of this study is to identify, examine, and analyze the perceptions and recommendations of instructors about how student authentication can be achieved and verified in online classes, as well as how institutional policies and practices can meet federal and accreditation requirements.

**Problem Statement**

Student authentication is considered as “the process of determining whether someone or something is, in fact, who or what it is declared to be” (Searchsecurity, 2007, para. 1), and student authenticity is considered “the implementation of activities and assessment strategies, which require the learner to apply the knowledge learned by using higher order thinking skills” (Baggio & Belderrain, 2011, p. 214). Student authentication and student authenticity are the sine qua non of any online course, because they pledge the quality of online instruction. Therefore, there is a great need for educational institutions to authenticate students and there is a great need for faculty members to be aware of the existence of substitute course takers and the importance of online course design to uphold the quality of online education.

Online learning appeals to a wide variety of students who seek convenient, accessible, and cost effective internet-based learning opportunities (Rivera & Rice,
2002). As online instruction increases, it is vital to consider the issues that impact the effectiveness of online instruction. One of these issues, as suggested by Olt (2002) is that the online environment may promote academic dishonesty, and there is a need for more empirical research regarding faculty perceptions of academic dishonesty and the various contextual factors that could contribute to the issue of academic dishonesty. “Little research exists that compares the cheating behaviors of on-campus and online students” (Western Interstate Commission for Higher Education, 2008, p. 3).

This study investigated the current understanding and knowledge of online faculty regarding student authentication and student authenticity.

**Purpose and Significance**

The purpose of this study is twofold. First, this study will identify institutional responses (existing policies and practices, professional development and training, and technology support services) to regulations enacted as part of the reauthorization of the Higher Education Opportunity Act of 2008. And, secondly this study will examine the level of faculty awareness of these federal regulations.

Many institutions of higher education find it difficult to fully integrate online learning (Dooley & Murphery, 2000). When such institutional change takes place, the roles of faculty, administration, student services, and, indeed the institution itself must also change (Bothel, 2001). Siemens (2007) stated that “while online education leaders were clearly aware of crucial issues impacting the quality and effectiveness of their online education programs-and often employed creative ways to address the problems-many institutions did not have well-established policies or strategies in place to effectively deal with critical issues” (p. 7). These issues of student authentication and
student authenticity impact the institutions’ efforts to fully integrate online learning. As online learning continues to grow, many academic institutions strive to protect the integrity of their educational system. To authenticate an online learner is a major challenge in the online learning environment. Determining who is actually taking an online test and to authenticate remote users in an online environment remains a challenge (Moini & Madini, 2009).

Three serious problems involving academic dishonesty in online assessment that have not been sufficiently considered by educational institutions are: (1) getting exam answers in advance: the earlier students can memorize or take screen shots of questions and supply them to later students; (2) unfair retaking of tests: students may retake a test multiple times by breaking their connection to the server intentionally during an assessment and asking for extra time to consult materials with others until they are satisfied with their performance; and (3) unauthorized help during the assessment: confirming that the student is in fact not who they say they are. An online learner may hire someone to complete her/his course assignments (Rowe, 2004).

Of great concern to the community colleges are the regulations enacted as part of the reauthorization of the Higher Education Opportunity Act of 2008 regarding authenticating the identity of online students. In response to the federal mandate, the Higher Learning Commission (2009) developed a new policy to verify the identity of students in online education. The recently adopted HLC policy requires that:

Institutions offering online education or correspondence education, as specified in the federal definitions reproduced herein solely for reference, shall have processes through which the institution establishes that the student who registers in the online
education or correspondence education courses or programs is the same student who participates in and completes and receives the academic credit. (The Higher Learning Commission, p. 9)

Jortberg (2009), in his pioneering study on student authentication, concluded:

The online education industry is now reviewing the best methods to increase academic integrity by implementing identity verification for online learning students to meet the demands of legislation (such as student authentication procedures) and diverse online education programs. Institutions need to evaluate their online assessment policies and match the right level of identity verification to meet the federal requirements regarding student authenticity to ensure the student who enrolls is also the student who does the work and gets the credit. (p. 10)

User authentication can be identified by three methods: (a) “methods based on human memory such as passwords”; (b) “methods based on physical devices such as magnetic or IC cards”; and (c) “methods based on biometrics such as fingerprint, iris, etc” (Asha & Chellappan, 2008, p.1). Accrediting agencies must ensure that online education programs have processes in place to verify student identity.

The HEOA language has shined a spotlight on what online educators already know: academic integrity is crucial to the acceptance of online learning as a means for delivering high quality education. Institutions must be diligent in their efforts to find both a technical and a pedagogical means to ensure students’ identification and performance in online courses and programs. (“Student Authentication, academic”, 2010, p. 1)
The online education accreditation standards on student authentication and student authenticity suggest more research regarding faculty perceptions about student authenticity in the online environment; therefore, there is a need for more empirical research.

The growth of online education has raised concerns about academic dishonesty (Varvel, 2005). Kennedy, Nowak, & Raghuraman (2000) predicted that academic dishonesty will increase along with the growth of online education classes. In their study regarding student and faculty perceptions of online academic dishonesty, Kennedy et al. (2000) found that 57% of students and 64% of faculty felt it was easier to cheat in online courses.

Student authenticity means that instructors design online courses in a way that it requires the learner to apply the knowledge learned by using higher order thinking skills and not just simply using traditional memorization and recall. Online faculty members are responsible for encouraging an environment in which academic honesty and good moral conduct are the norm (Clement, 2001). Faculty who develop and teach online courses should have a comprehensive understanding about academic integrity in order to be in compliance with federal rules and accreditation standards.

This study is significant because the faculty importance ratings and satisfaction ratings of institutional policies and practices, professional development and training, and technology support services regarding student authentication and authenticity in online learning will benefit educational institutions’ decisions, plans, and policies for alternative modes of course offerings in the future. This study will help professional development coordinators to offer training and in-service programs in course design and instructional
delivery strategies specifically for online faculty. Based upon the findings of this research, recommendations for the policies and practices in online courses will be made.

**Research Questions**

This study will attempt to answer the following research questions using a quantitative approach. A performance gap was computed for the first three research questions. The performance gap was computed by finding the difference between importance ratings and satisfaction ratings. The larger the positive gap between importance and satisfaction, the greater the opportunity for improvement. Areas where respondents assign high importance and have low satisfaction are areas in which the institutions may want to concentrate efforts.

1. Is there a significant difference between faculty importance ratings and satisfaction ratings of institutional policies and practices regarding student authentication and authenticity in online learning?

2. Is there a significant difference between faculty importance ratings and satisfaction ratings of professional development and training regarding student authentication and authenticity in online learning?

3. Is there a significant difference between faculty importance ratings and satisfaction ratings of technology support services regarding student authentication and authenticity in online learning?

4. To what extent are online faculty members aware of the importance of student authentication and authenticity in online learning?

5. How well does the combination of faculty background characteristics, institutional policies and practices, professional development and training, and technology support
services predict faculty awareness of the importance of student authentication and authenticity in online learning?

The variables used for this study include the difference between the means of online faculty’s ratings on importance and satisfaction for institutional policies and practices, the difference between the means of online faculty’s ratings on importance and satisfaction for professional development and training, the difference between the means of online faculty’s ratings on importance and satisfaction for technology support services, the faculty’s awareness of the importance of student authentication and authenticity in online learning, the years of teaching fully online courses, the full-time faculty in the primary college of assignment, the percentage of online teaching load as full-time faculty at the primary college, discipline area in the STEM fields, the mean of the importance ratings on institutional policies and practices, the mean of the importance ratings on professional development and training, and the mean of the importance ratings on technology support services. A Likert-type scale was used for faculty awareness of student authentication and student authenticity.

**Operational Definitions**

The following definitions offer a guide for understanding the terms in this document.

**Asynchronous learning.** Learning in which the teacher and the learners are engaging at different times. For example, in a discussion, an instructor may make a post on Monday morning that is replied to by Student A on Monday evening and Student B on Tuesday morning (Delaney, 2007).
Best practices. “The adoption of work practices which, when effectively linked together, can be expected to lead to sustainable, world class outcomes in quality, customer satisfaction, flexibility, timeliness, innovation and cost competitiveness” (Inglis, Ling & Joosten, 1999, p. 162).

Cyber-plagiarism. “Copying or downloading in part, or in their entirety, articles or research papers found on the Internet or copying ideas found on the Web and not giving proper attribution” (University of Alberta Libraries, 2010).

Effectiveness. Based on Fraser (1994), effectiveness is when an institution creates goals and meets those goals.

Faculty awareness. Faculty awareness, as used here, means whether or not a faculty member has confidence that a student completing coursework is the same individual who actually enrolled in the course.

Identity. “Is a term that reflects uniqueness, sameness and distinctness. Hence, when an e-assessment security system solicits an answer to the “who are you?” question; it simply requires that the student provide a unique response, which distinguishes him/her from every other student. A typical form of response used in e-assessment is the username” (e.g. student log-in name) (Apampa, Wills, & Argles, 2009, p. 2).

Online course. “An educational program whose primary delivery source is the Internet. The course site on the Web is self-contained in that the student does not meet in person with other learners or the instructor. Communication is asynchronous, occurring through e-mail, listservs, multi-user object oriented environments, threaded discussions, and chat rooms” (Gilbert, 2001, p. 242).
Online education. “Planned learning that normally occurs in a different place from teaching and as a result requires special techniques of course design, special instructional techniques, special methods of communication by electronic or other technology, as well as special organizational and administrative arrangements” (Moore & Kearsley, 1996, p. 2). “A course where most or all of the content is delivered online. Typically have no face-to-face meetings” (Allen & Seaman, 2010, p. 5).

Plagiarism. "Is the deliberate adoption or reproduction of ideas or words or statements of another person as one's own without acknowledgement" (Kibler, Nuss, Paterson, & Pavela, 1988, p. 2).

Student academic dishonesty. "Forms of cheating and plagiarism which result in students giving or receiving unauthorized assistance in an academic exercise or receiving credit for work which is not their own" (Kibler et al., 1988, p. 1). The terms academic dishonesty, academic misconduct and cheating appear to be used interchangeably throughout this literature.

Student authentication (Verification). “Is the process of determining whether someone or something is, in fact, who or what it is declared to be” (“Authentication,” Searchsecurity, 2007, para. 1). “Authentication is any process by which a system verifies the identity of a user who wishes to access it” (“Authentication,” Hitachi-id, 2011).

Student authenticity. “In the online environment, authenticity is achieved through the implementation of activities and assessment strategies which require the learner to apply the knowledge learned by using higher order thinking skills and not just simply using traditional memorization and recall. Authentic learning begins with
engaging, yet challenging, lessons and activities that move the learner toward achieving learning goals” (Baggio & Belderrain, 2011, p. 214).

**Teaching classification.** Distinction between full-time or part-time teaching status as determined by the institution.

**Traditional classroom.** “A physical setting in which an instructor and a learner are in the same location at the same time for instructional purposes” (Colagross, 2000, p. 9).

**Use of effective online course design.** According to Christe (2003), course designers should “Be sure to use a multilayered approach to promote student honesty. Design the course well before it starts. Communicate well while the class is in session. Monitor students carefully. Lastly, rework the class after each semester” (p. 58).

**Theoretical/Conceptual Framework**

Using Albert Bandura’s (1991) theoretical framework of Social Cognitive Theory (the role of faculty in encouraging and deterring deviant behavior, i.e. academic dishonesty) and James Rest’s (1986) theoretical framework of Moral Development Model (the four component model of morality that addresses the complex processes involved in moral behavior), as this study investigated the correlational relationship between characteristics of degree-granting institutions of higher education and how the characteristics related to faculty perceptions of student authentication and student authenticity.

Faculty members need to design their courses to promote interactivity and to prevent and/or to minimize academic dishonesty. The role of faculty in designing the course materials, delivery, and testing methods is crucial in online learning. If an
instructor connects with students personally, then there are fewer chances that the students will cheat. Feelings of belonging are important components in determining behavior in Bandura's Social Cognitive Theory. Connections, social norms, and role modeling contribute to creating an environment, which encourages academic honesty among students (Bandura, 1991).

In order to produce “moral responsibility”, James Rest (1986) developed his four-component model of moral behavior: 1) moral sensitivity, 2) moral judgment, 3) moral focus, and 4) moral character. According to moral sensitivity, a moral problem cannot be solved unless we first know that one exists. Therefore, online faculty members need to educate their students on how their behavior affects others. According to moral judgment, decision makers (in this case, online faculty), need to make judgments about what is the right or wrong decision in each particular situation. According to moral focus, online faculty must be focused and motivated to follow through on their moral choices. According to moral character, decision makers must execute a plan of action to reach their ethical goals. “Educators are at the threshold of reaching students in unprecedented ways, but they must first understand how roles are redefined by technology and how ethics influence roles and behaviors” (Baggio & Belderrain, 2011, p. 28).

The issue of academic integrity is a liable one for higher education because it is crucial to the institution’s academic mission, reputation, and the qualifications it presents. Navigating the cyber environment to obtain information requires guidance, and faculty should help students by providing meaningful applications of knowledge. Therefore, to challenge students to become reflective, critical thinkers, the online faculty should keep
pace with technology as well as the andragogy of teaching online (Beldarrain, 2006).

Baggio and Belderrain (2011) note that “The anonymity afforded by technology creates a veil behind which unethical behavior is more difficult to identify, the role of cyber educators has been redefined to include policing of academic integrity” (p. 33).

Therefore, online faculty members are ethically and morally responsible for creating a safe environment for everyone that nurtures trust and engagement. Not only must online faculty protect the rights of students to express their opinions, they are also responsible for educating students on how to express opinions without offending other students.

**Overview of Methodology**

This study attempted to answer research questions using a quantitative approach. The sample population of this study was faculty members who teach online courses in California community colleges. The data was collected by an online survey, which was based on anonymous self-report. Participation was voluntary and no individual responses were released.

**Limitations and Delimitations**

There were four potential limitations noted in the methodology of the study. One was connected to sampling, where the sample was self-selected, and not a random sample. Another potential limitation was that a self-report survey was used for data collection, which may be subject to the limitations of survey instruments, in that the participants could have given socially acceptable responses. A third potential weakness is that the findings are from public community colleges in California, and this may limit the generalizability of the results. A fourth potential weakness could have been related to the nature of the presentation of the survey, which was only available through the Internet.
and there was a possibility that respondents could have interpreted the questions on their own, without the advantage of asking questions about the questionnaire.

The delimitations of this study included only community colleges as opposed to universities. All of the community colleges were public institutions as opposed to private institutions. The participants were limited to faculty members who taught fully online classes.

**Organization of the Dissertation**

This dissertation has five chapters, organized as follows: chapter one covers the statement of the problem; chapter two reviews the literature regarding student authenticity in an online environment and examines what strategies can be used to authenticate online learners, also discussing student authenticity in a theoretical context and providing an overview of the contextual factors that contribute to academic dishonesty, presenting an overview of prevention practices; chapter three provides a discussion of the methodology used for this study which includes the design of the online faculty perceptions of policies and practices related to student authentication and student authenticity at California community colleges with an online learning instrument and descriptive statistics to analyze the data; chapter four discusses the results of the statistical procedures used to analyze the data; and, chapter five covers the interpretations and implications of this study for implementation of best practices and future research.
Chapter II: Review of the Literature

Introduction

The purpose of this literature review is to present research findings associated with student authentication and student authenticity in online education. These two issues are problematic for the educational community with stakeholders at many different levels. Federal and State government agencies, accreditation agencies, academic institutions, administrators, staff, faculty, and students can all be involved when it comes to student authentication and student authenticity. This literature review will include an analysis and discussion of online faculty perceptions of policies and practices related to student authentication and student authenticity in online learning.

Distance education is not a new mode of delivery. Almost a century ago, distance education was delivered by mail, which was recognized as correspondence studies (Moore & Kearsley, 1996). Although the historical timeline for distance education dates back more than 100 years, teaching students through the Internet is a fairly new concept. “There is little doubt that the immense, eclectic, and often stimulating content available on the Internet can lead to learners and teachers spending large amounts of time exploring and learning using this medium” (Anderson & Garrison, 1998, p. 107). Although online learning is now more accepted as a dependable form of instruction, as it expands, some doubts about the issue of student authentication (verification process) and student authenticity (student activity) remain in the minds of faculty. Institutions of higher education find it difficult to entirely integrate online learning (Dooley & Murphrey, 2000). Authentication systems are still in their early development and cannot be addressed with one single solution. Baggio and Belderrain (2011) believe that the current
authentication methods such as biometrics (fingerprints or iris shape) and public key infrastructure (technology policies and practices that underlie the use of a key) are not as common in education as in the world of business and commerce. They further discuss “It is important for cyber educators to realize the importance of authentication and authenticity. If the institution has a weak authentication method, the chances of security breaches increase” (Baggio & Belderrain, 2011, p. 214). As administrators and faculty members integrate online education into the onsite academic curriculum, the roles of faculty, policy, and student services change (Bothel, 2001). In order for changes to be fully effective, it is important to ensure that all issues related to online education be identified and understood. Moreover, changes should be based on recent research and involve the relevant stakeholders (Colagross, 2000).

The rapid increase in online course offerings demands faculty with unique knowledge and competencies to teach online courses (Rivera & Rice, 2002). The physical disconnection between instructor and students in an online environment requires the instructor to take different steps to ensure an authentic learning environment (authenticity) such as relying on proctored exams, different types of assessment, advanced technological software, an interactive course design, and academic integrity policies.

King, Guyette, & Piotrowski (2009) found that “73.6% of the respondents have the perception that it is easier to cheat in an online class versus a traditional course” (p. 7). According to a study conducted at Friends University in 2009, “both students and teachers perceived that cheating was more frequent in virtual classrooms. But self-reported instances of actual cheating were significantly higher among traditional students
than they were among online students” (Williamson, 2009). Even if the reasons for cheating in online classes are the same as the reasons for cheating in onsite classes, for example, ignorance of class policies, compensation for poor planning and time management skills, poor study skills, competition from classmates, and aggressive parents, faculty and administrators have to be creative and innovative to protect the integrity of courses conducted in an online setting (Lagier & McEfee, 2011).

The process of verifying student identity is referred to as ‘student authentication’ and the different types of students’ activities and assessments in online courses are referred to as ‘student authenticity’ (Baggio & Belderrain, 2011). Using online resources, utilizing software tools, re-designing assignments, and assigning thought-provoking topics are some of the ways faculty can guard against academic dishonesty and maximize student authentication (Lagier & McEfee, 2011). Baggio and Belderrain (2011) consider student authentication as the responsibility of an organization’s information technology team and student authenticity as the responsibility of online educators.

One question that arises is the manner in which institutions should implement online education so that it is honest, ethical, fair and consistent with the delivery of traditional educational methods. The data in this paper was collected from the research literature, federal and state documents, and an online survey. The information obtained highlights the significance of student authentication and student authenticity not only for faculty and students, but also for academic institutions and agencies that develop policies for best practices.
The review of the literature covers information about 1) the emergence of student authentication from the federal government, accreditation requirements, and the Higher Education Opportunity Act of 2008, 2) the effects of faculty awareness, institutional policies and practices, professional development and training, and technology support services on the effectiveness of student authentication and authenticity (see Figure 2.0). The summary discusses how this literature will contribute to faculty awareness of student authentication and authenticity issues in online learning.

Figure 2.0. The Summary of Current Literature
Federal and Accreditation Mandates

The Accrediting Commission for Community and Junior Colleges (Accrediting Commission for Community and Junior Colleges, Western Association of Schools and Colleges, ACCJC/WASC, 2010) defines online education as:

Education that uses one or more of the technologies described below to deliver instruction to students who are separated from the instructor; and to support regular and substantive instruction between the students and the instructor, synchronously or asynchronously. The technologies included in the definition of online education may include: The Internet, one-way and two-way transmissions through open broadcast, closed circuit, cable, microwave, broadband lines, fiber optics, satellite, or wireless communications devices, audio conferencing, video cassettes, DVDs, and CD-ROMs, if the cassettes, DVDs, or CD-ROMs are used in a course in conjunction with any of the technologies listed in the clauses above, and correspondence. (p. 20)

“Student authentication in online education has been an issue of interest to federal policymakers for several years” (California Community Colleges Chancellor’s Office, 2011, p. 38). According to the California Community Colleges Chancellor’s Office (2011), “The policy and regulatory conversations concerning identity authentication, originally focused on academic dishonesty, now encompass the serious problem of financial aid fraud, as reported in some high-profile cases” (p. 38). In United States v. Trenda Lynne Halton et al. (2010), the defendant Halton and 64 others were indicted in June 2009 on various offenses related to a conspiracy to defraud the United States of more than $500,000 in student loan funds. The indictment charged that between July
2006 and October 2007, Halton and four other defendants who worked with Halton, recruited individuals to act as “straw” students (to get student loans but never attend school) then applied for federal financial aid in the form of Stafford Loans and Pell Grants, in order to attend Rio Saldado Community College in Arizona State, even though they were neither active students nor intending to become active students. Halton submitted admission and financial aid applications on behalf of the other students, with forged and false information, and then charged a fee to the “straw” students ranging from $500 to $1,500. She also accessed online classes using the identity of the “straw” students to generate attendance records, which caused Rio Salado to authorize financial aid payments to the “straw” students (Ryman, 2009). Tillman (2009) reported that a police investigation at the University of Texas at Brownsville and Texas Southmost College found school employees in 2008 had committed "gross academic fraud" after student employees and regular staff used their positions to steal test answers, cheat, give the answers to other students, or sell the test answers.

To ensure an authentication process, the Office of Online Education at Rio Salado College: (a) implemented new policies; (b) limited the number of employees with high levels of administrative access; (c) restricted student employees who worked in the Office of Online Education from enrolling in online courses or hybrid courses; and (d) developed a formal process for student employees to obtain an administrative password (Tillman, 2009).

The federal government grants millions of dollars in student financial aid for higher education, and imposes many requirements on the way institutions handle and use funds under federal programs. It enforces certain conditions for postsecondary
institutions, faculty members, and students as the recipients of federal aid. The requirements constitute the most important source of precise restrictions on an institution’s administration of financial aid (Kaplin & Lee, 2007). “Federal student loans have a key advantage over regular consumer loans because they don't have to be paid back while the student is in school. Federal grants such as the Pell don't have to be paid back at all” (Ryman, 2009). The federal government put forth additional guidelines in the Higher Education Opportunity Act of 2008 (HEOA), to ensure student identity in online classes. In turn, the regional accrediting bodies have been pressured to scrutinize the quality of online programs during accreditation and reaccreditation visits.

“A variety of regional and professional accrediting groups came into being in the early 1900s in response to the public’s demand for reliable indicators of institutional quality” (Distance Education and Training, 2011). The Department of Education, as required by law, publishes a list of “nationally recognized accrediting agencies that the Secretary determines to be reliable authorities as to the quality of education or training provided by the institutions of higher education and the higher education programs they accredit” (U.S. Department of Education, Office of Postsecondary Education, 2011). In addition to quality, accrediting agencies look at why online education courses are being offered at an institution. Accreditation agencies check to see whether institutions have established the suitable groundwork needed to support their online education initiatives. Despite the fact that accreditation agencies take an adaptable approach to the type of structures required, they look for integration of administrative structures, planning and oversight mechanisms, and online programs that take place in the framework of existing academic programs. The accreditors expect the same approach to online education
planning as they do with an institution’s onsite planning (Council for Higher Education Accreditation, 2002).

The passage of the Higher Education Opportunity Act of 2008 placed new responsibilities on regional accrediting commissions to ensure that colleges were providing quality online educational instruction for students, including student authenticity. In response to the federal mandate, many regional accreditors posed the following questions to accredited institutions:

• When examinations are employed (paper, online, demonstrations of competency, etc.), they take place in circumstances that include firm student identification. How does an institution otherwise seek to assure the integrity of student work?

• If proctoring is used, what are the procedures for selecting proctors, establishing student identity, assuring security of test instruments, administering the examinations, and assuring secure and prompt evaluation?

• If other methods are used to identify those who take the examination, how is identification firmly established? How are the conditions of the examination (security, time limits, etc.) controlled?

• Does the institution have in place effective policies and procedures to assure the integrity of student work? (The Higher Learning Commission, 2009, p. 13)

The accreditation standards of the HOEA of 2008 provide guidelines in helping the institutions’ staff and faculty evaluate important parts of their institution’s programs. According to the Accrediting Commission for Community and Junior Colleges (ACCJC)
of the Western Association of Schools and Colleges Standards (2002): “Technology planning is integrated with institutional planning. The institution systematically assesses the effective use of technology resources and uses the results of evaluation as the basis for improvement” (p. 18). A survey sponsored by the Western Interstate Commission for Higher Education showed that most institutions had not made adaptations to meet the needs of online learners (Dirr, 1999). The Standard II (part L) of Distance Education and Training Accreditation Handbook (2011) covers student integrity and identity. According to this standard, “The institution has clear, specific, published academic policies related to student integrity and academic honesty. The institution has a student identity verification process that ensures that students who earn the credit or completion credentials are the same students who did the course assignments and assessments” (Distance Education and Training, p. 45). Based on this new standard, online administrators need to make sure faculty members have access to the technology and expert personnel that can provide technical support services when required. Making available additional technology support services or rebuilding the infrastructure to accommodate faculty in achieving goals must be a continuing process (Siemens, 2007).

Robinson (2000) noted “Administrators who have educated themselves about ODL will be able to create a positive culture that will support others on their campus as they learn and adapt to the new technologies” (as cited in Levy, 2003, para. 9).

The Higher Education Opportunity Act of 2008 requires institutions that offer online education to have security mechanisms in place each time the student participates in online coursework. This does not mean that the institutions of higher learning must only adopt sophisticated and expensive technology. The post-secondary institutions may
use different approaches. Barbara Brittingham, the President of NEASC (North England Association of Schools and Colleges), in her interview with CTDLC (The Connecticut Online Learning Consortium, 2008) Executive Council described the role of the Regional Accrediting Agencies and the Federal Department of Education in addressing student authentication:

While this is the current law, NEASC is not requiring a ‘solution’ now, especially not a technological one. Referring to colleges and universities, Brittingham explains that “You should be prepared to address how your institution approaches the issue through faculty training, instructional design, assessment plans, work with student service providers, course monitoring, or other methods which your institution believes protects the integrity of your online classes and programs. (B. Brittingham, Interview, November 18, 2008)

In response to NEASC, the Connecticut Online Learning Consortium provides the following guidelines for achieving student authentication in online courses:

• The type of faculty training is provided to help faculty use these types of pedagogy and technology,
• Any review that the online learning coordinators do of course to ensure they meet these standards,
• Any training the institution does for students in their online courses on academic integrity
• How academic integrity is dealt with in online orientation courses.
• Any required language in a course syllabus that pertains to these issues. (The Connecticut Online Learning Consortium, 2008, p.1)
McNabb (2009a) notes that cheating can include plagiarism, fabrication, falsification, misrepresentation, and misbehavior. “But, only one—misrepresentation—is addressed through the legislation. Additionally, the legislation is aimed solely at online and correspondence courses, therefore many online educators are developing programs and policies in isolation from the integrity efforts of the institution” (McNabb, 2009a, para. 3). In 2009, Eduventures published the results of a member survey on reactions to the authentication legislation. Approximately 30 percent of the survey respondents pointed out they had or would be taking steps to meet the HEOA requirements, but more than 60 percent were unsure as to whether their institutions would make policy changes (McNabb, 2009a). After having student authentication language in the HEOA, online education programs are simply forced to get their house in order by training and supporting online faculty (McNabb, 2009a).

Conradson & Hernandez-Ramos (2004) provided three strategies that teachers and administrators can use to minimize academic dishonesty. “The application of commercial, technology-based tools for detecting plagiarized schoolwork, 2) the establishment of academic policies for reducing cheating behaviors, and 3) the re-evaluation and redesign of traditional methods of educational assessment” (p. 6).

**Faculty Awareness of Student Authentication and Authenticity**

According to Marcoux (2002), an understanding of faculty perceptions, awareness, knowledge, and procedures toward dishonesty can help educational institutions to deter academic dishonesty. Student authentication is a security challenge in an online environment because verifying a remote user’s identity in situations where the student submits login information is unsupervised. Faculty awareness of student
authentication and student authenticity in this literature review focused on whether a student sitting in front of a computer, taking a test or finishing an assignment, is the same individual who was authenticated initially, at the start of the login session. “The process of student authentication can be seen as the first level of security to confirm the identity of the learner and establish trust” (Baggio & Belderrain, 2011, p. 214). The relationship between the adoption of more updated student identity verification techniques and the perceptions of faculty regarding improvements in academic honesty and institutional creditability should be studied more comprehensively, despite the fact that, no system will fully eliminate the issue of student dishonesty (Schaefer, Barta, & Pavone, 2009).

Baggio & Belderrain (2011) believe that online faculty members are responsible to ensure that the work submitted by a student matches the student’s ability. In order to address identity in online education, Bailie and Jortberg (2009), list several available methodologies: 1) a course design that emphasizes student portfolios instead of high point weighted exams; 2) the utilization of proctored exams (face-to-face and via webcam); 3) biometric solutions such as fingerprints, retinal scans, and facial and voice recognition programs; 4) synchronous monitoring solutions that include such items as Internet Protocol (IP: a numerical label assigned to each computer participating in a computer network) monitoring (software that detects discrepancies in response patterns such as how an individual types), web video recording, and telephone callbacks; and 5) the use of challenge questions (Bailie & Jortberg, 2009). Nonetheless, students should be informed that the institution has not violated the U.S. Department of Education’s Family Education Rights and Privacy Act (FERPA) by adopting the proctored exams, web video recording, and or any other technical solutions.
“Teaching in a global, information-rich environment is a very different experience than lecturing in a closed classroom” (Anderson & Garrison, 1998, p. 109). According to the seminal work by McCabe (2010), both the student and faculty participants reported that the Internet was the main source for plagiarized materials and cheating on online tests or exams. In research conducted by McCabe (2010), 27.4% of student participants agreed with the question ‘if they have ever taken an online test at Texas Tech, using notes or books on a closed book online test and looked up information on the Internet when not permitted’. Additionally, 53.4% of faculty participants agreed with the question ‘collaborating with others during an online test, when not permitted, is the most common form of cheating on an online test’ (McCabe, 2010).

The California Community Colleges Chancellor’s Office Online Education Report (2011) points out, “Significant faculty-student interaction is not only a requirement by Title 5 of the California Code of Regulations for online education, it is also a foundation of quality instruction, academic integrity, and student authentication” (p. 22). Stanford-Bowers (2001) pointed out that “designing a course and implementing a program of study which is conductive to the online environment while providing meaningful learning experiences is a special challenge for the online instructor” (p. 18).

The results of McNabb and Olmstead (2009) suggested “levels and types of academic dishonesty are similar in an online environment to that found on-campus, and that successful efforts to encourage integrity are similar regardless of whether the course is online or on-campus” (p. 218). The findings in McNabb and Olmstead’s study shows three influential factors in creating communities of integrity in the classroom. Design, communication, and collaboration were identified as the driving forces responsible for
the classroom successes of the University of Texas faculty members (McNabb & Olmstead, 2009). They further discussed that in the area of course design “a faculty member can design tasks that challenge and interest students, require team collaboration, and provide opportunities for students to contribute on a personal level, all of which facilitate student honesty” (McNabb & Olmstead, 2009, p. 216). In the area of communication with students, McNabb & Olmstead (2009) noted that including expectations in the course syllabi, encouraging honest work, developing a class honor code and asking students to commit to it, providing a definition of academic integrity and cheating, and creating an awareness of campus policies encourage communities of integrity in online courses. In the area of collaboration between students, McNabb and Olmstead (2009) concluded that the involvement of students as stakeholders in the process of creating the desired community would promote a successful collaboration.

Lever-McDuffy et al. (1996) discussed the importance of curricular revision for online delivery of material and identified three differences between curriculum design for online and onsite classes. First, additional attention and advanced preparation is needed to develop and/or select instructional approaches for the class. Secondly, the identification of appropriate support technologies may require extensive review and evaluation of technological options. Lastly, formative (whether students have learned what the instructor intended) and summative (whether students have met the course goals or student learning outcomes at the end of a course or program) evaluation methodology for online learning must be developed.

In “Highway Robbery in an Electronic Age”, McKenzie (1998) suggested that “teachers should transform topical research into projects which demand that students
move past mere gathering of information to the construction of new meanings and insight” (p. 3). The role of a traditional faculty member from handling curriculum development, content development, information delivery, remediation and tutoring, student support services, administration, and assessment has changed. Now, in the world of online education, a different department should handle each of these tasks. This “unbundling” of the components of the educational process is a key trend in online education in the United States (Dirr, 2003).

To promote academic integrity in an online environment, Western Interstate Commission for Higher Education (2009) suggested that faculty should “Emphasize assignments that require written work and problem solving (e.g., essays, papers, online discussions) and use a variety of assessment strategies (quizzes, short and long papers, test questions that require the application of a theory or concept)” (p. 3). Olt discussed that academic dishonesty in online student assessment can be minimized by (a) acknowledging the disadvantages; (b) designing effective online assessments; (c) rotating the curriculum by assigning original assignments; and (d) providing students an academic integrity policy (Olt, 2002).

McKenzie discussed that “as more schools become wired and students become more computer savvy, instructors are complaining that new technologies have made it all too easy for students to gather the ideas of others and present them as their own” (as cited in Ercegovac & Richardson, 2004, p. 308). The lack of academic integrity among college students has always been a challenge to educators and administrators, but as Conradson & Hernandez-Ramos (2004) noted, “The Internet and the development of computer competencies among secondary school students have facilitated a practice of ‘cutting and
pasting’ web-based text and other electronic resources without proper attribution” (p. 12).

Conradson & Hernandez-Ramos, (2004) discussed that educators structure their assignments so that students won’t feel the need to plagiarize and cheat. They presented a list of suggestions of how to structure course assignments to deter academic dishonesty from web sources.

According to Christe (2003), an instructor should “Be sure to use a multilayered approach to promote student honesty. Design the course well before it starts. Communicate well while the class is in session. Monitor students carefully. Lastly, rework the class after each semester. “Many things” is the short answer to what to do to ensure student honesty. As in the traditional classroom, no one-step, ideal solution will ensure integrity in the virtual classroom” (p. 58).

To encourage student honesty, Christe (2003) discussed five general areas of online education that require attention: the syllabus, the presentation of content, the student/instructor relationship, the assessment design, and monitoring. “It is important to revisit each area every semester for adjustment, clarification, and changes. Doing so will prevent a carbon copy of a course being presented to the next group of students” (Christe, 2003, p. 55).

To minimize the negative aspects of fully online courses, many educational institutions have adopted a blended or hybrid course design. Colis and Moonen (2001) defined blended learning as a mixture of traditional face-to-face and online activities. In this model, instruction occurs in both the classroom and online. Blended courses offer the convenience and flexibility of fully online courses without the complete loss of faculty and student interaction. Research that focuses on faculty and student participation
reports that blended course design is considered the “best of both worlds” (Dziuban, Hartman, & Moskal, 2004).

Olt (2002) pointed out that the design of an online course could facilitate academic honesty by contributing to any of the three different approaches of policing, prevention, and virtue (Olt, 2002). Students want faculty members to clearly communicate expectations, be supportive and fair, focus on learning rather than grades, encourage the development of good character, and assign interesting and nontrivial assignments in their classrooms (McCabe, Treviño, & Butterfield, 2001).

To avoid cyber cheating, in their Low-Tech Detection strategies list, Lagier and McEfee (2011) recommended the following steps to faculty:

- Create unique assignments with specific criteria that canned papers most likely will not address.
- Require students to adhere to an instructor-prepared list of unusual or narrow topics.
- Insist papers contain specific components or kinds of resources.
- Require students to follow a list of sequential process steps for the paper.
- Require the inclusion of annotated bibliographies.
- Discuss plagiarism with students.
- Place the emphasis on the research process.
- Require students to apply rather than describe ideas.
- Include a reflection paper as a supplement to the assignment.
- Design assignments that require detailed explanations, problem-solving, and decision-making. (Lagier & McEfee, Presentation, April 2011)
In his 2010 survey, McCabe found that student and faculty participants had different perceptions about who should be accountable for maintaining academic integrity on campus. Faculty participants believed that students were responsible for monitoring the academic integrity of other students on campus. In contrast, the student participants believed that the faculty members were responsible for discovering and reporting academic dishonesty. McCabe recommended that by creating a campus dialogue, students and faculty could learn about the maintenance of academic integrity on campus (McCabe 2010).

According to Coalter, Lim, & Wanorie (2007):

Research on faculty perspectives of academic integrity is scarce but crucial to academic integrity. Faculty members have the responsibility to uphold the academic integrity of their institutions, students, and themselves. Our society is demanding that higher education nurture and graduate students who can distinguish between right and wrong. An understanding of students’ perspectives is important but to restore integrity in higher education requires a better understanding of faculty perspectives. (p.3)

Academic integrity concerns exist amongst administration and faculty. In their study at the University of Texas System TeleCampus, McNabb and Olmstead (2009) found that about one-half of faculty members believed that the probability of cheating in an online course was the same as in an on campus course.

In study, at a state university in the northeastern U.S., Hard, Conway, and Moran (2006) found that faculty overestimated the actual frequency of academic dishonesty. The faculty members who underestimated the occurrence of academic dishonesty very
rarely took action to challenge students’ misconduct, and the faculty members who overestimated the amount of cheating were more attentive in their efforts to preclude it (p. 1076). Their research proposed that “Both faculty and students should be provided accurate information as to the extent of academic misconduct occurring at an institution. Faculty members “need to send [the] message to students through prevention and detection efforts” (Hard, Conway, & Moran, 2006, p. 1076).

McCabe (2001) found that “instructor sympathy for students and the tedious procedures involved in reporting dishonesty are the factors that most often cause instructors to ignore academic dishonesty” (as cited in Lim & Coalter, 2006, p. 155). In addition they noticed that reporting the incidents of dishonesty is a difficult process for faculty, starting from when they decide to file, document, and defend a charge. “Instructors usually feel unsupported, isolated, and attacked during the whole process. Because charging students with dishonesty is serious, and the judicial process ensures that students are protected from wrongful charges, instructors must be willing to endure an onerous process” (Lim & Coalter, 2006, p. 157).

McCabe (2005) performed studies over a three-year period of time involving 83 different campuses in the U.S. (67 campuses) and Canada (16 campuses). He found that 41% of faculty had ignored incidents of cheating. McCabe (2010) discovered that the majority of faculty members respond to cheating by failing the student on the test or assignment. Almost half of the faculty reported that due to a lack of proof, they ignored a suspected incident of cheating (McCabe, 2010). According to the University of Alberta Libraries Guide (2011), “a study conducted on nine campuses at Rutgers University at Newark found that of 800 professors at 16 institutions, 54% had "seldom" reported
cheating, 40% had "never" reported cheating, and only 6% had "often" reported cheating”. Faculty members (including online and onsite) are normally reluctant to file a formal charge due to the following reasons:

- Some perceive the university judicial process as tedious, time-consuming, and un-supportive of faculty members.

- Often the punishments do not fit the crime. For example the punishment for plagiarism at some universities may be the same whether the student stole another person's entire paper, handed it in as original work, and committed fraud, or the student misquoted a source, or didn't give proper attribution for either words or ideas. Clearly these are different degrees of academic dishonesty.

- Most faculty members do not want to damage the student's reputation or career and would rather confront the student themselves.

- It can be difficult to prove that plagiarism has occurred.

- Some faculty members are concerned that lodging formal charges against a student can reflect negatively on their teaching skills.

- Tracking down a plagiarized paper or the sources used can require hours of research.

- University departments may not have consistent policies established for dealing with plagiarism.

- Some faculty members believe that they have very little impact on the judicial process when cases are turned over to administration.

- It can be a traumatic, emotionally draining experience for a professor to charge a student with cheating. (University of Alberta Libraries, 2011)
McCabe (2001) noted that when students know that their instructors care about academic honesty and will take proper procedures, they are less likely to be untruthful (McCabe, 2001). McCabe (2004, as quoted in Varvel, 2005) wrote that in the absence of clear direction from faculty, “most students have concluded that ‘cut & paste’ plagiarism – using a sentence or two (or more) from different sources on the Internet and weaving this information together into a paper without appropriate citation – is not a serious issue” (Varvel, 2005, P. 8).

The Council of Writing Program Administrators, (2003) asserted that faculty members need to use numerous techniques to encourage students to investigate and analyze sources. Keeping assessments and assignments current, avoiding generic or recycled assignments, and designing assignments that require analysis and depth of thought are considered as useful strategies. Software, such as Turn-It-In.com and others, are also available to detect plagiarism.

In another light, with a particular focus on academic dishonesty, some faculty members might have a heighten awareness for academic dishonesty in online classes. For example, in the realm of academic disciplines, there is a subcategory of courses taught in the fields of science, technology, engineering, and mathematics. These courses are referred to as STEM classes. It has been suspected that some faculty who teach STEM courses are reluctant to online teaching, because they are skeptical about the quality of online lab science course delivery. There is further speculation that for those who teach online courses, they would be more vigilant of the possibility of students engaging in academic dishonesty compared to faculty who teach in other academic disciplines. Moore and Kearsley (2005), found that the subject matter was one
of the important variables that pertained to the nature and extent of distance learning
transactions. Schulte (2010), also found that faculty perceptions in the
mathematics/physical science and business/computer science/leadership subject areas
were different from one another. Similarly, faculty in the fields of business/computer
science/leadership found it more natural and more productive to teach their courses in
computer driven technology distance education environments.

**Institutional Policies and Practices**

Educational policies are rules that are written by different constituent groups such
as academic senate, unions, and different committees. The implementation of
educational policies are referred to as practices. For example, an honor code is a type of
policy and the implementation of an honor code is a practice. Educational policies
provide a framework for institutional procedures. In the impressive work by Moore &
Anderson (2003), they mentioned that “A distance education policy is a written course of
action adopted by an institution to facilitate the development of online education
programs” (p. 417). “Among over 4,000 institutions of higher education in the US, only
270 have self-described honor codes” (The Center for Academic Integrity, n.d.). An
institution’s academic honesty procedures and policies can have a substantial influence
on students’ conduct. Honor codes establish an expectation for honest academic behavior
and clearly state the consequences for academic dishonesty. Students act more
responsibly when an honor code exists (McCabe et al., 1999).

The fundamental value of an “academic integrity policy” should be discussed and
promoted by educational institutions from admission to graduation to students (The
Center for Academic Integrity, n.d.). Faculty members are influenced by institutional
academic dishonesty policies when deciding about whether or not to file charges against students for suspected academic dishonesty (Coalter, Lim, & Wanorie, 2007). Faculty respondents, in the Coalter, Lim, and Wanorie study, believed that the lack of consistency in the implementation of the campus’ academic honesty policy was a major issue for faculty with one of the reasons given as being due to the difficulty in compiling evidence or proof of misconduct. The more a judicial process protects all parties involved in an institution, the more faculty members would follow procedures and charge violators with academic dishonesty (Coalter et al., 2007).

For successful Internet-based online learning to occur, online learning administrators must be aware of, analyze, and modify the technology support structures that are vital to online course delivery and learning (Levy, 2003). Since higher education administrators are responsible for student support services such as online tutoring and an online writing lab, directing institutional policy, and allocating necessary resources, educational institutions can be more successful in utilizing online instruction when administrators fully recognize and understand the complexities involved (Ludwig, 2002).

Administrative procedures in online learning fall under the general headings of planning (institutional mission, master plan, policies and procedures, marketing plan, needs assessment, and evaluation), organization, resources, personnel and student services (Pina, 2005). “Colleges that want to have an effective online learning program need to consider all aspects of providing an education, which are much more than simply putting classes online” (Levy, 2003, para. 44). They need to define and address faculty and student support policies and administrative procedures that guide appropriate online education development (Levy, 2003).
Bothel (2001) emphasized that the success of an online program depends on visionary administrators who know how to direct, plan, and implement. Bothel further noted that institutional policies play a critical role in online learning planning and it should be made clear that online learning planning must follow strict institutional guidelines (as cited in Whicker, 2004). In research conducted by Colagross (2000), the results showed that a high percentage (96%) of the respondents, who were academic administrators employed within Alabama’s 29 two-year colleges, stated “faculty training in the use and development of online education should be a budget priority and part of an institutional plan” (p. 82).

Due to changes in online educational policies put forth by regional accrediting agencies, colleges have shown that they will develop a student authentication policy (California Community Colleges Chancellor’s Office, 2011). Still, 87% of online education coordinators responded “no” to the question “Does your district have a board of trustees approved student authentication policy?” (California Community Colleges Chancellor’s Office, 2011). The establishment of a campus-wide policy on academic integrity and an institutional commitment to enforcing the policy and supporting faculty demonstrates an institution’s commitment to academic integrity and student verification (Western Interstate Commission for Higher Education, 2009).

Along those lines, the California Community Colleges Chancellor’s Office (2011) mandated that

All colleges should develop and adopt district policies identifying student authentication policies and procedures for online education courses in accordance with the federal regulations and regional accrediting standards resulting from the

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passage of the Higher Education Opportunity Act of 2008, passed into law by Congress. The growth in enrollments and in the number of educational providers of online learning has fueled concerns about institutions verifying the identity of students throughout the cycle of an online course: registration, participation, assessment, and academic credit. (p. 64)

Faculty as well as institutions should clearly state the academic dishonesty policies verbally and in their syllabi. Students should be informed that lecture handouts, course outlines, syllabi, and other instructional materials belong to the school and the distribution of those materials to others is considered cheating (Moeck, 2002). “There is a lack of alignment between offences and punishment and a lack of communication among administrators, faculty, parents, and students. Other problems are related to students’ state of readiness to understand issues involved in academic dishonesty and plagiarism and in relationships with peers, teachers, and as part of their educational climate as a whole” (Ercegovac & Richardson, 2004, p. 310).

To encourage critical thinking, McKenzie (1998) suggested that institutions “award credit for smart collecting but also show them how to differentiate between the ideas they have collected from others and those ideas which have emerged in reaction to the ideas of others” (p. 6). Moeck notes that answering these questions can minimize cheating among community college students: (a) What is cheating?, (b) Who cheats?, (c) Why do students cheat?, and (d) How can cheating be discouraged? (Moeck, 2002).

According to Christe (2003), “Understanding why students may be dishonest is important to a faculty member who must communicate expectations and monitor behavior” (p. 54). The issues surrounding academic dishonesty are the same for online
and onsite classrooms (Christe, 2003). Christe (2003) stated that “most faculty are well-equipped to look for cheating notes during an exam or question a student with a flimsy excuse, in the nontraditional classroom environment, new workaround techniques can leave faculty off-guard or unprepared” (p. 53-54).

Academic integrity policies promote a unique sense of community on campus at the institutional, classroom, and individual level. It fosters a culture of trust, honesty, fairness, responsibility, and respect. According to The Center for Academic Integrity (2010), a consortium of over 360 institutions, an ideal code, or academic integrity policy should include the following elements:

- speaks to consensus institutional values
- enforceable and culturally appropriate proscriptions, prescriptions and practices
- student involvement and ownership
- students are primary educators (and are recruited from among acknowledged student leaders and esteemed peers)
- streamlined process (to reduce the "hassle factor" for faculty and students)
- competent and reliable investigation (often conducted by a trained, impartial and permanent judicial investigator)
- fair and consistent adjudication and sanctioning
- central recordkeeping that merges academic and non-academic infractions into a single disciplinary file. (The Center for Academic Integrity, n.d., para. 4)
Institutions that approve and successfully communicate academic integrity policies and penalties tend to reduce cheating among students (McCabe et al., 2001). Colleges should develop policies and procedures for student authentication. Sanctions other than discharge should be acknowledged. In order to promote the culture of integrity, colleges should review required policies and procedures carefully. In addition to clear policies and procedures for students, community colleges may also need to train their online faculty on how student authenticity is defined and the institution’s procedures for handling violations.

The City University of New York outlines the following strategies for promoting academic integrity:

1. Orientation sessions for all new faculty (full and part-time) and students.
2. All college catalogs, student handbooks, and college Web sites should include the college academic integrity policy and the consequences of not adhering to it.
3. A faculty report form should be used throughout the colleges to report incidents of suspected academic dishonesty.
4. A Web site on Academic Integrity should be developed.
5. A Student Guide to Academic Integrity should be published.
6. Colleges should consider establishing an Academic Integrity Committee to serve in lieu of grade appeals committees in cases of academic dishonesty.

(City University of New York, 2011, p. 5-6)

Professional Development and Training
In the online survey "How Do Undergraduate Mathematics Faculty Learn to Teach Online?" that was sent via e-mail to 64 faculty who taught online undergraduate mathematics courses throughout the United States, Pankowski (2004) found that although eighty nine percent of the participants in her study had some professional training regarding teaching online courses, “about half said that the training they received did not adequately prepare them to teach online. In addition, 60% said that they would have benefited from more training in facilitating online interaction before they began teaching online” (para. 1). Additionally, Pankowski recommended that training for faculty to teach online should contain four major components: (a) technical training (a course management system that would be used to deliver the online course and the use of other software); (b) pedagogical training (facilitating interaction and discussion, active learning and collaboration in online courses; assessment and evaluation for online courses and community-building activities for online courses); (c) mentoring (assistance from a particular colleague); and (d) online coursework, which means as part of training, faculty should experience online education from the student’s point of view (Pankowski, 2004).

For institutions that offer online degree and certificate programs, the Southern Association of Colleges and Schools created a list of best practices that has five components: (a) institutional context and commitment; (b) curriculum and instruction; (c) faculty support; (d) student support; and (e) evaluation and assessment (The Commission on Colleges Southern Association of Colleges and Schools, 2006).

To familiarize online faculty with online instruction, all educational institutions should provide training opportunities on how to teach online courses. One hundred percent compliance with training mandates is so important, that anything less is
considered to be substandard and inadequate. Based on responses from more than 2,500 colleges and universities in the United States, nearly one-fifth (19 percent) of all institutions do not provide any training (even informal mentoring) for their faculty teaching online courses (Allen & Seaman, 2011, p. 19). Among those institutions that do have some form of training, most provide more than one approach. Informal mentoring (59% of all institutions with online offerings) and internally run training courses (65%) are the most common approaches (Allen & Seaman, 2011).

If academic institutions do not provide training for online courses, then online faculty will not have sufficient technology skills to structure the courses that are accessible to disabled students under the American with Disabilities Act. The burden of responsibility will fall on the faculty’s shoulder to seek their own mentors and training. Then instructors become the ones who are obliged to solve the technical problems as they appear. For faculty to help students in online classes, it requires technology training that is not available to most instructors (Levy, 2003). In order to reduce resistance and to maximize acceptance of new technology in online courses, faculty members need to be trained.

Dooley and Murphrey (2000) used SWOT analysis (strengths, weaknesses, opportunities, threats) to examine the perceptions of administrators, faculty, and support staff in regards to online education. To promote online learning, three steps were suggested by faculty: (a) “increased administrative commitment for more and better technical support and “seamless” infrastructure; (b) more training, not just in technology but also instructional design and pedagogy; and (c) more faculty incentives such as release time, stipends, or credit towards promotion” (as cited in Hirner, 2008, p. 28).

It appears that faculty members are the primary source for students learning about academic integrity policies at Texas Tech with a large majority of the student participants (97.1%) reporting that they “learned some” or “learned a lot” about these policies from faculty. Other common sources for learning about these policies appear to be a first-year orientation program (70.5%), student handbook (64.4%), or teaching assistant (68.8%). (p. 8)

The academic integrity strategies should be incorporated into professional development and faculty training offerings. Additionally, the academic integrity strategies and policies should be published in faculty handbooks and web-based faculty resources (Western Interstate Commission for Higher Education, 2009).

McNabb and Anderson (2011) noted that academic integrity can be encouraged by faculty and administrators in an online course by three different approaches: (a) ideas for the virtue approach (develop students who do not want to cheat); (b) ideas for the prevention approach (eliminate or reduce the opportunities to cheat and reduce the pressure to cheat); and (c) ideas for the policing approach (catch and punish those who do cheat may also have a deterrent or preventive effect). Additionally, McNabb and Anderson (2011) recommended that administrators communicate with faculty on a regular basis about policies and practices, the incidence of cheating, and the importance of punishment. Effective professional development training for online faculty is the focus of research by Berg and Huang (2004), who promote ongoing professional training of faculty with newer technology.
Technology Support Services

The Information Technology Department/Office plays a vital role in the verification of online students. “Authentication is essential to both privacy and anonymity on the Internet; it is also crucial in establishing trust in the online learning environment” (Baggio & Belderrain, 2011, p. 213). Perhaps more than ever before, technological advancement and the offering of web-based classes have questioned the efficacy of student authentication policies in deterring academic dishonesty. To ensure academic integrity in an e-learning environment, three security requirements should be expected of the learner: (a) presence: poses the question are you there; (b) identity: poses the question who are you; and (c) authenticity: poses the question is it really you (Apampa et al., 2009). Therefore in an e-learning environment, it is inadequate to assume correctness of a student based only on identity. Biometric technology, the measurement of the inherent physical characteristics of an individual such as fingerprint, facial recognition, and hand geometry, is a unique method used to ensure student authenticity (Apampa, Wills, & Argles, 2010).

Jortberg (2009) mentioned that methods of verifying the identity of online students in the field of online education is a recent, debated security and privacy policy. Jortberg (2009) also discussed “how students who want another person to take an exam on their behalf would willingly share their user ID and password to achieve a certain grade, even if it explicitly violated IT, academic and ethics policies” (p. 5).

Ramzan (2007) discussed how two-factor authentication can guarantee security and it is achieved by choosing two of the following three methodologies.
There are three mechanisms that can be used to prove to someone else that we are who we say we are:

(1) something we have - a driver’s license, access card, or key

(2) something we are - a biometric like a fingerprint

(3) something we know - a password, or other common information about ourselves (like a social security number, mailing address, or our mother’s maiden name). (Ramzan, 2007, p. 1)

While student authentication is becoming a widespread concern, the lack of face-to-face, faculty-student interactions, have forced online education providers to regularly scrutinize their online programs and develop strategies to ensure the integrity of their academic programs. The student authentication requirement could “drive up the cost of these important educational programs if expensive student authentication procedures are mandated” (Compass Knowledge Group, 2010, p. 1). “It’s important to evaluate whether a particular technology will have some positive impact. We can consider that impact in relation to the cost of the technology and only then can we make the correct tradeoffs” (Ramzan, 2007).

Jortberg (2009) noted that the type of delivery of online courses would influence the level of student scrutiny. “Advanced-level courses with face-to-face, threaded discussions, term papers or complex projects are less likely to have the same identity verification requirements. Just as assessments differ across community colleges, lower- and upper-level undergraduate and graduate programs, identity verification coverage should also be different” (p. 10). The Higher Education Opportunity Act of 2008
(HEOA) requires institutions that offer online education to have security mechanisms in place. “This includes methods such as:

- A secure login and pass code (as through the Course Management System);
- Proctored examinations;
- New or other technologies and practices, which are effective in verifying student identification” (Compass Knowledge Group, 2010, p. 1).

Schaefer, Barta, and Pavone (2009) suggested that there are a number of existing technologies and techniques that can facilitate the validation of students’ identities. Multiple methods are listed as “improved course design that emphasizes student portfolios, projects, and papers; the utilization of proctored exams (in person and via webcam); technological solutions that validate biometric attributes such as fingerprints, retinal scans, and facial and voice characteristics; synchronous monitoring techniques that include such items as IP authentication, response pattern analysis, and telephonic callbacks; and the use of challenge questions derived from third-party data providers that are not student driven” (Schaefer found in Bailie & Jortberg, 2009).

When faculty members administer online assessment, in the form of test, quizzes, essays, security issues arise. The strategies that are used to authenticate online students are in their infancy. As Row argued (2004): “For these reasons, online assessment in online-learning programs should be done with caution until more progress is made on the technical development of countermeasures” (p.8). Cizek (1999) discussed that there is a need for academic institutions to produce a clear set of mandatory guidelines for the assurance of the quality of assessment design. The following steps are measures to improve the quality assurance process: (a) mandatory training and certification of faculty
involved in online learning; (b) piloting of new ideas and technologies in assessments; (c) full evaluation of online learning within institutions; (d) define cheating and encourage honesty; and (e) proctor the assessment. In addition, Cizek states “Proctors can ensure that students take the assessment at a designated time, without collaborators, and without unauthorized materials. But if computers are used, proctors cannot see everything possible unauthorized materials stored on them” (as cited in Row, 2004, para. 21).

In response to the Higher Education Opportunity Act of 2008, the verification of student identity (poses the question ‘who are you?) in online courses, and growing concerns over academic honesty in the online environment, the John Jay College of Criminal Justice at the City University of New York (2011) developed a few strategies for its proctoring style. Face-to-face meetings between the program participants and professors for exam-taking, web-video conference proctors, students finding their own proctor in their community (clergy, librarian, supervisor at a testing center), challenge questions to enter the exam, biometrics- fingerprinting, iris-scanning, voice recognition, and course design that emphasized student papers and portfolios were among some of their strategies (City University of New York, 2011).

**Summary**

It is a challenging time of transition for teaching with technology, whether online, hybrid, and/or web enhanced classrooms in higher educational institutions. In addition to faculty involvement, administrators must work with the faculty to develop plans and procedures for successful implementation of student verification process. It is essential that administrators understand which factors are considered to be influential in faculty decisions to teach online courses. The perceptions of faculty, regarding online learning,
and the formulated and implemented policies and practices of student authentication and student authenticity are influential factors affecting the quality of online programs.

While online education is becoming the most widely used medium, concerns increasingly focus on how to integrate appropriate technologies and effective course designs in order to provide support services to online faculty. As online education continues to grow, it is even more crucial that online faculty members are trained in the appropriate instructional practices regarding student authentication and student authenticity. Online administrators, faculty, and staff should keep in mind that an institution’s accreditation status can be at risk if professional development programs are not in compliance with the HEOA of 2008 and accrediting agencies’ standards. Community colleges should systematically conduct quality assurance reviews that ensure online faculty members possess skills and knowledge about student authentication and student authenticity.

The role of individuals in online education leadership is to form conditions that support the implementation and integration of technology for online teaching and learning. In addition, the technology infrastructure, such as course management systems and appropriate software, must offer sufficient provisions to address frequent technological upgrades to keep current with the 21st century technological world. During the planning stages of online education development, administrators should be aware of, and prepared for, the challenges that could arise.

To deal with the challenge of implementing online education support services, administrators may incorporate student support services into professional development and in-service training for faculty. The training could help educators to understand the
online learner and learn current strategies for students (Floyd & Casey-Powell, 2004). To meet federal and accreditors’ requirements, faculty training, support services, and institutional policies and practices regarding student authentication and student authenticity should be in place.

According to the American College of Technology (2011), “Verifying the identity of students in our courses and programs is a significant, multifaceted, and ongoing process. Identity verification begins when a student applies for admission to the college and continues through his/her graduation, transfer, or withdrawal from study” (p. 2). Preventive procedures related to student authentication and student authenticity at colleges include: appropriate technology, innovative course design, professional development and training, and preventive policies and procedures.

Authentication systems for online education are still in their infancy. Online education is growing rapidly and there are many challenges to overcome before a program is accredited, articulated, and effective, but, with appropriate institutional commitment and resources, community colleges are in an excellent position to serve the needs of their online learners.
Chapter III: Methodology

Introduction

A quantitative research design was selected for this study. Quantitative data was collected through an online survey that was completed by 100 California community college online faculty members. The information presented in this chapter includes a discussion of (a) the research design, (b) the population and sample, (c) the instruments and procedures, (d) data collection procedures, (e) data analysis, and (f) a summary.

Authenticating an online learner is a challenge in online instruction, because determining who is actually taking an online test and authenticating a remote user in the online environment is not a simple process (Moini & Madini, 2009). The primary purpose of this study was to examine the effectiveness of student authentication and student authenticity in online learning at California community colleges.

This study focused on four key aspects of student authentication and student authenticity: (a) faculty awareness, (b) professional development and training, (c) support services, and (d) institutional policies and practices. This study was guided by the following research questions:

1. Is there a significant difference between faculty importance ratings and satisfaction ratings of institutional policies and practices regarding student authentication and authenticity in online learning?

2. Is there a significant difference between faculty importance ratings and satisfaction ratings of professional development and training regarding student authentication and authenticity in online learning?
3. Is there a significant difference between faculty importance ratings and satisfaction ratings of technology support services regarding student authentication and authenticity in online learning?

4. To what extent are online faculty members aware of the importance of student authentication and authenticity in online learning?

5. How well does the combination of faculty background characteristics, institutional policies and practices, professional development and training, and technology support services predict faculty awareness of the importance of student authentication and authenticity in online learning?

**Research Design**

This study utilized a cross-sectional survey design to assess the individual and institutional level factors that influence faculty’s perceptions of student authentication and student authenticity. The cross-sectional survey design is the most popular form of survey used for gathering data in education (Creswell, 2012). In a cross-sectional survey design, “the researcher collects data at one point in time” (Creswell, 2012, p. 377). Cross-sectional designs, as opposed to longitudinal designs, measure current attitudes or practices from participants and information can be collected in a short amount of time. The survey method is appropriate for asking individuals to self-report about specific attitudes, beliefs, opinions, and practices that are not readily available. Surveys are also useful instruments for describing characteristics of large sample populations (Babbie, 2013). The purpose of the survey method for this study was to generate quantitative, or numerical data, by using a self-administered online survey that could later be analyzed statistically.
In quantitative research, the researcher (a) decides what to study; (b) asks specific, narrow questions; (c) collects quantifiable data from participants; (d) analyzes the data using statistics; and (e) conducts the inquiry in an unbiased, objective manner (Creswell, 2012).

The data for this study were collected and analyzed using quantitative research methods. The online self-administered survey method was the most appropriate for this study for several reasons. First, the researcher was able to identify and access the sample population within the state of California with relative ease. Secondly, respondents were able to complete questionnaires at their own convenience, anonymously. And thirdly, the survey design describes existing demographic characteristics of faculty participants with respect to their attitudes and impressions concerning student authentication and student authenticity in online courses.

**Population and Sample**

**Population.** The California community colleges (CCC) serve more than 2.9 million students and are the largest system of higher education in the nation. It is a large system of two-year colleges that offer Associate Degrees, Career Technical Education certificates, and lead students to transfer to four-year colleges and universities. The CCC system is comprised of 72 districts and 112 campuses. The California community colleges provide open access and affordable education to all who desire to learn. In order to address the educational needs of a diverse California student population and to provide flexible learning venues, the community colleges offer courses through online education. The online courses allow students to pursue their educational goals regardless of time or
location. Students with job responsibilities, child-care issues, and/or transportation problems can pursue their education through internet-based classes.

Each community college has an identified person to serve as a coordinator for online education. Coordinators are the site contact people for the Chancellor's Office. They should also “consider the needs and interests of students and faculty, and work with the college community to meet institutional goals through the effective implementation of technology-delivered instruction” (California Community Colleges Chancellor’s Office, 2011).

The prospective sample (a subset of some population) for this research was composed of online faculty members from all active, degree-granting institutions of higher education in the California community colleges system. Not only do online faculty members provide instruction in the college, they are also involved in the development and the design of online courses. In this study, some of the faculty participants were from multi-college districts, and some were from a single-college district. Although community colleges across California have utilized online education, there have been varying degrees of implementation. The growth of online education has not been equally distributed across the state. Some colleges offer as few as fifteen online sections while other colleges have more than one hundred online sections. In general, online education sections have continued to grow from 21,407 in 2005-06 to 39,964 in 2009-10 (California Community Colleges Chancellor’s Office, 2011).

**Sample.** The study incorporated the use of a self-administered, electronic survey for the collection of quantitative data. One hundred online faculty members from
California community colleges served as subjects (N=100). Participation was voluntary and the respondent’s identity remained anonymous.

Individual online faculty members were the focus of this study and the researcher used a non-probability random sampling (cannot be trusted to be representative of some specified population). The prospective respondents were identified and contacted by 1) snowball sampling; 2) the colleges’ online education Web sites; 3) the Etudes’ faculty Web site; and 4) LinkedIn’s professional Web site.

The snowball sampling method involves selecting the first respondent and then asking the respondent to refer the researcher to another respondent. Snowball sampling technique recruits large numbers of participants for study. It eliminates the possibility of identifying respondents (Creswell, 2012).

Participants were identified using the snowball sampling method in the following way: The online education coordinators and online faculty members through the Chancellor’s office and the list of California community colleges were identified as seed participants (researcher’s initial point of contact). Then, the researcher asked participants to identify others who might be potential members of the sample. Next, potential participants were contacted by telephone and/or email (see Appendix A). Then they were sent an email with a description of the purpose of the study and the link to the online survey, and were asked to forward emailed instructions to online faculty who taught or were teaching at California community colleges and who had experience teaching fully online courses. The email also provided a brief explanation of what the survey was about, as well as a short discussion of its usefulness. The email concluded by thanking respondents for their time and consideration (Appendix B).
A second way that potential participants were identified was based on the availability of faculty’s email addresses in a college’s Web site. The size of the colleges surveyed ranged from small institution to large institutions. The faculty respondents were from different discipline areas (English, Communications, Mathematical Concepts, Arts and Humanities, Social and Behavioral Sciences, Physical and Biological Sciences, and Language other than English).

A third way that potential respondents were identified was through the Etude’s faculty Web site. “Etudes is a non-profit organization that offers centralized hosting, support, and professional development opportunities to institutions and organizations that need a course management solution” (Etudes, n.d.). The executive director of Etudes was contacted and agreed to post an announcement regarding the purpose of this study and a link to the survey on the faculty member’s login page.

A final way to recruit potential participants was from LinkedIn. It is a professional online network that connects its members through social networking and helps them to exchange knowledge, ideas, and opportunities within an online network of professionals. The researcher posted an announcement regarding the purpose of this study and a link to the survey on a Student Authentication discussion group on LinkedIn (LinkedIn, n.d.).

Since this research focused on faculty members, not a specific institution, the sampling frame (a complete list of all online faculty members of the California community colleges) was not utilized in this study. Due to the lack of a valid sampling frame, this researcher is unable to make claims about representative sampling.
(generalizing from the sample to the population once the study is completed) and generalizability in this research.

**Instruments and Procedures**

The instrumentation for this study was based on the impressive work of Conradson & Hernandez-Ramos. They provided three strategies that teachers and administrators can use to minimize student cheating. “The application of commercial, technology-based tools for detecting plagiarized schoolwork, 2) the establishment of academic policies for reducing cheating behaviors, and 3) the re-evaluation and redesign of traditional methods of educational assessment” (Conradson & Hernandez-Ramos, 2004, p. 6). To examine the effectiveness of student authentication and student authenticity, the survey for this study expanded upon their work, and included: 1) faculty awareness; 2) institutional policies and practices; 3) faculty professional development; and 4) technology support services.

As a result of the analysis of data used in the 2011 Distance Education Report, one of the seven recommendations to the board of governors of the California community colleges regarding online education focused on institutional policies (California Community Colleges Chancellor’s Office, 2011). According to this report “All colleges should develop and adopt district policies identifying student authentication policies and procedures for online education courses in accordance with the federal regulations and regional accrediting standards resulting from the passage of the Higher Education Opportunity Act of 2008, passed into law by Congress” (California Community Colleges Chancellor’s Office, 2011, p. 64).

To promote academic integrity in online education, the list of best practice
strategies produced by Western Interstate Commission for Higher Education (2009) suggested that colleges “incorporate academic integrity strategies into professional development and faculty training offerings” (p. 2).

The passage of the Higher Education Opportunity Act of 2008, followed by federal rulemaking, resulted in new regulations for online instruction that were required by accrediting agencies. These regulations required online education programs to have processes in place to verify student identity. A secure login and password, proctored exams, and authenticating technologies were the authentication approaches required in the federal guidelines. According to the California Community Colleges Chancellor’s Office (2011), “the regulation guidelines place an expectation that colleges will continue to look at future technological solutions. While colleges are for the most part compliant with the regulations, few have taken formal positions on student authentication” (p. 78).

A 46-item questionnaire, including a combination of 45 closed-ended questions and one open-ended question, was drafted (see Appendix C). The 45 closed-ended questions in this survey were divided into five different categories: (1) faculty awareness; (2) institutional policies and practices; (3) faculty professional development and training; (4) technology support services; and (5) online faculty demographics.

Nine questions were included in the faculty awareness section. Twenty questions were included in the policies and practices section, with ten questions designed to measure the level of importance of each question on institutional policies and practices, and with ten questions designed to measure the level of satisfaction of each question on institutional policies and practices. It can be inferred from the responses to the level of importance and the level of satisfaction that faculty expectations are in line with the
college’s performance. Satisfaction can be determined by how well outcomes meet or exceed expectations.

Eight questions were included in the faculty professional development and training section of the survey, with four questions were designed to measure the level of importance of each question on professional development, and with four questions designed to measure the level of satisfaction of each question on professional development. Four questions were included in technology support services, with two questions designed to measure the level of importance of each question on technology support services, and with two questions designed to measure the level of satisfaction of each question on technology support services.

The last question was created as an open-ended question, so the respondents could have an opportunity to state their general comments on student authentication and student authenticity. The results of this question were summarized and recorded in Appendix D.

The queries reflected issues related to student authentication and student authenticity activities usually undertaken in online learning by community colleges. The purpose of four demographic questions was to gain information about the participants’ demographic backgrounds (number of years teaching online courses, teaching classification as full-time or part-time, current percentage of online teaching load, and discipline area). A five-point Likert-type scale, ranging from “very important” to “not important at all” (5= Very Important, 4 = Important, 3 = Neutral, 2 = Unimportant, 1 = Not important at all, 0= Does not apply) was used for faculty awareness of student authentication and student authenticity, institutional policies and practices, faculty professional development and training, and technology support services. In addition,
these questions were measured on a five-point Likert-type scale ranging from “very satisfied” to “very dissatisfied” (5 = Very Satisfied, 4 = Satisfied, 3 = Neutral, 2 = Dissatisfied, 1 = Very Dissatisfied, 0=Does not apply) for faculty satisfaction toward institutional policies and practices, professional development and training, and technology support services.

It was estimated that it would take participants approximately ten minutes to complete the questionnaire, although the actual time commitment spend responding to the questionnaire depended on how much detail the participants choose to put into the answering open-ended question. The purpose of the questionnaire was for participants to reflect on (1) faculty awareness; (2) institutional policies and practices; (3) faculty professional development and training; (4) support services; and (5) online faculty demographics. The research focused on what steps community colleges took to ensure student authentication and student authenticity in their online programs.

The findings of this study were assessed based on content validity. Content validity is defined as “the extent to which the questions on the instrument and the scores from these questions are representative of all the possible questions that a researcher could ask about the content or skills” (Creswell, 2012, p.162). This study addressed the issue of content validity by ensuring the thoroughness and completeness of data and ensuring the credibility and accuracy of the data. By conducting a member check, the researcher ensured that the data recorded, accurately reflected what the participants said.

Five raters were selected through personal knowledge by the researcher to test the instrument and to check for its validity, specifically on the areas related to the connectedness of the five different parts of the survey. These higher education
professionals, all with doctoral degrees in education and sociology, but all had extensive experience in teaching online and onsite courses. These raters provided valuable feedback regarding clear wording, understandable instructions, irrelevant questions, and grammatical errors. After adjustments were made, they were in consensus that the survey had content validity and would assess the components for this study.

Data Collection Procedures

Permission to conduct the research needed to be granted by the Office of Research and Sponsored Projects from California State University of Northridge. Then, the researcher obtained email addresses of faculty teaching online classes during the 2011 academic year from different colleges and directory Web sites. Once email addresses were obtained, the researcher sent a letter describing the general purpose of the study, what the researcher expected to learn, the respondent’s choice for participation, and the link to the online survey via email to potential participants (see Appendix C). The survey was administered electronically through SurveyMonkey, a web based Software Company that allows the public to conduct, manage, and analyze data.

Confidentiality, which means not identifying individuals specifically (Creswell, 2012), was explained in the email, along with the time needed to complete the electronic survey. The researcher ensured anonymity of responses by not having any direct contact with the potential participants and the researcher could not identify who responded to the survey, or from which college the survey was returned. “The clearest concern in the protection of the subjects’ interests and well-being is the protection of their identity, especially in survey research” (Babbie, 2013, p. 67). In an effort to increase response rate, a reminder was sent by e-mail to some of the seed participants. The participants had
the choice to either click on the "next" button to participate and proceed with the survey, or click on the "cancel" button and exit the survey. The survey was conducted online for a total of two weeks until 100 responses were collected. The researcher began data entry as completed surveys were returned.

Data Analysis

This section presents the statistical techniques that were used for interpreting the data. Analysis used both descriptive and inferential statistics. Descriptive information included variable names, variable descriptions, and information related to the distribution of variables. A reliability test was also conducted for scaled dependent and independent variables. In addition, multiple regression analysis was utilized for analyzing faculty’s typical responses to student authentication.

To examine faculty perceptions of the effectiveness of student authentication and student authenticity in online learning at California community colleges three strategies were used: 1) paired t tests; 2) a descriptive research design (measures value or score that represents the entire distribution, and describes the spread of the scores); and 3) multiple regression.

Independent Variables. The number of years teaching online courses, teaching classification as full-time or part-time, current percentage of online teaching load, and discipline area served as the independent variables in this study (See Table 3.0).

Dependent Variable. Faculty awareness of student authentication and student authenticity served as the dependent variable in this study.
### Table 3.0

**Variable Names and Descriptions for this Study**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difference in policies</td>
<td>Difference between the means of online faculty’s ratings on importance and satisfaction for institutional policies and practices</td>
</tr>
<tr>
<td>Difference in professional development</td>
<td>Difference between the means of online faculty’s ratings on importance and satisfaction for professional development and training</td>
</tr>
<tr>
<td>Difference in services</td>
<td>Difference between the means of online faculty’s ratings on importance and satisfaction for technology support services</td>
</tr>
<tr>
<td>Awareness</td>
<td>Faculty’s awareness of the importance of student authentication and authenticity in online learning</td>
</tr>
<tr>
<td>Years of teaching</td>
<td>Years of teaching fully online courses</td>
</tr>
<tr>
<td>Full-time status</td>
<td>Full-time faculty in the primary college of assignment: 0 = No, 1 = Yes</td>
</tr>
<tr>
<td>% Online teaching load</td>
<td>% of online teaching load as full-time faculty at the primary college</td>
</tr>
<tr>
<td>STEM fields</td>
<td>Teaching courses in the STEM fields: 0 = No, 1 = Yes</td>
</tr>
</tbody>
</table>
## Table 3.0 (continued)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Importance of policies</td>
<td>Mean of the importance ratings on institutional policies and practices</td>
</tr>
<tr>
<td>Importance of PD</td>
<td>Mean of the importance ratings on professional development and training</td>
</tr>
<tr>
<td>Importance of services</td>
<td>Mean of the importance ratings on technology support services</td>
</tr>
</tbody>
</table>

The *t* test is the most widely used method to evaluate the differences in means between two groups. The *t* test allows researchers to answer a question by determining a *p* value (statistical significance). The *p* value of a result is the probability that the observed relationship between variables or a difference between means in a sample is not due to chance. Results that are significant at the *p* equal to or less than .05 means that the finding has a five percent (.05) chance of not being true. Results that are significant at the *p* equal to or less than .01 level are commonly considered statistically significant, and *p* equal to or less than .005 or *p* equal to or less than .001 levels are often called "highly" significant (Babbie, 2013).

Descriptive statistics typically include measures of central tendency (mean, median, mode) in the data, the spread of scores (variance, standard deviation, and range), and associations between variables (Creswell, 2012). Researchers use descriptive statistics as a tool to present data in an organized and summarized manner.
The primary aim of multiple regression is to estimate the effect of several independent variables on an outcome or dependent variable. Multiple regression allows for prediction of the value of the dependent variable based on a linear combination of independent variables (Creswell, 2012). Specifically, this study was interested in predicting the influence of independent variables on faculty’s awareness about student authentication and student authenticity. Researchers use multiple regression, because human behavior is a complex phenomenon and a single cause for human behavior is rare. Therefore, using multiple regression to analyze multiple influences provides responses to the relative significance of multiple independent variables, and is also able to separate the contribution of each independent variable.

A non-experimental design was used, because this research (a) was not establishing a cause and effect relationship between independent and dependent variables; (b) was not testing theories; (c) was not comparing two or more groups; and (d) was not controlling for all variables that might influence the outcome (Creswell, 2012).

The study was conducted in two stages: First, the researcher performed a carefully focused literature review to identify any relevant factors as well as any hypothetical solutions of verifying students. Any identified factors that emerged from the literature were addressed through the design of the survey. Second, a questionnaire was constructed that participants completed online. Responses to multiple-answer questions were scored automatically by SurveyMonkey, the online survey software. A summary of the responses to the open-ended question is reported in Appendix D. These responses helped to better understand perceptions of the respondents in a subjective format.
All the data collected from the survey was compiled into the SPSS (Statistical Package for Social Sciences) 19.0 Statistical Software Package. The data findings and analyses are presented in Chapter four.

Summary

Cases of academic dishonesty and financial aid fraud are widespread and statistically rising. Selwyn (2008) discussed the prevalence, nature, and underpinning facilitators of five examples of Internet-based misbehavior (e.g., misrepresentation of self and unauthorized access to someone else’s account, unauthorized downloading of music and film, Internet pornography, online plagiarism, and other cyber-cheating). In his study of 1,222 students, Selwyn found that 93.9% of undergraduate students in the United Kingdom self-reported online misbehavior.

Online faculty must be aware of what their students are doing. Faculty must be aware of the ways students use their unlimited resources and the possibility of using surrogates to complete a course. As long as the online faculty does not know what to look for, or how to look for academic fraud, the problem of academic dishonesty is compounded. The adherence of faculty to policies and practices, professional development opportunities, and technology support services can deter cheating incidents.

The purpose of this study was to design an instrument to measure faculty perceptions of policies and practices related to student authentication at California community colleges offering online learning courses. In order to answer the research question, a valid and reliable instrument was created, however there were some limitations for this study. First, due to the limited number of online faculty, the sampling procedure utilized snowball sampling. Consequently, the researcher could not guarantee
that each participant in the population was represented in the sample. Second, the sample size was relatively small (N=100) and did not represent all community colleges. Finally, the inability to authenticate remote users in online courses and the lack of proper technical mechanisms to authenticate students remained a major concern to the researcher in this study. After collecting data, a series of paired $t$ tests, descriptive statistics and a multiple regression were used to analyze the data, which will be presented in chapter four.
Chapter IV: Results

Introduction

This chapter presents the findings of the data analysis from this research study. To examine faculty perceptions of the effectiveness of student authentication and student authenticity in online learning at California community colleges three strategies were used: 1) a descriptive statistics; 2) t tests; and, 3) multiple regression. Given the differential relationship between the importance of student authentication and student authenticity and the level of satisfaction of student authentication and student authenticity, independent t tests were calculated to investigate differences in scores between the importance and the satisfaction for institutional policies and practices, faculty professional development and training, and technology support services. Descriptive statistics were used to summarize demographic data so they could be comprehended more easily. Multiple regression analysis was used to examine the relationship between independent variables that might influence the dependent variable.

The research methods outlined in chapter three were followed in an effort to answer the research questions. All of the data collected from the survey were compiled into the SPSS (Statistical Package for Social Sciences) 19.0 Statistical Software Package. The SPSS was used to code and tabulate scores collected from the survey and provide summarized values including the reliability, mean, central tendency, t tests, standard deviation, and multiple regression analysis.

The results of the data analyses were organized around each specific research question and description of the survey procedures. The results of the data will be presented in the following six sections: (a) Descriptive Statistics, which summarizes the
participants’ demographic characteristics, (b) Reliability Analysis, which measures the consistency of the survey instrument, (c) Results of t tests, (d) Analysis of Faculty Awareness, (e) Results of Multiple Regression, and (f) a Summary. Discussion of the findings and conclusions based on the results of this study will be presented in chapter five.

**Descriptive Statistics**

The demographic characteristics of the faculty members that were examined were number of years teaching online, teaching classification as full-time or part-time, current percentage of online teaching load, and discipline area. The survey was formatted in surveymonkey.com and the prospective respondents (faculty members who taught online classes at California community colleges) were identified and contacted by 1) snowball sampling; 2) the colleges’ online education Web sites; 3) the Etudes’ faculty Web site; and 4) LinkedIn’s professional Web site. At the conclusion of the two-week period, 100 faculty members had responded to the survey. One hundred responses were used for data analysis. The researcher examined all submitted surveys and found that all 100 surveys were usable, but not all respondents answered every question. The survey contained five domains: (a) faculty awareness; (b) institutional policies and practices; (c) faculty professional development and training; (d) technology support services; and (e) demographic questions.

Table 4.0 displays the descriptive statistics for the faculty member’s demographic characteristics. It converts large sets of data into values that are more meaningful and easier to interpret. It also summarizes the distribution of data. In descriptive statistics, two primary types of measures are used: measures of central tendency (Mean), and
measures of variability (Standard Deviation). The mean represents the arithmetic average of the data. The standard deviation reflects both the deviation from the mean and the frequency of this deviation. According to Salkind (2012), “Most researchers go beyond just a description of outcomes, but this first step is an essential part in summarizing the outcomes of what’s being investigated” (Salkind, 2012, p. 85). Standard deviations are reported along with means as two important parts of descriptive statistics. Information about the range of variables is contained in the Minimum and Maximum columns. For example, the Teaching years in the online mode of delivery ranged from one to fifteen years with a mean of 6.38 years and a standard deviation of 3.697 ($M= 6.38, SD =3.697$). This shows that the participants in the study have been teaching online courses for more than six years. Fifty-eight percent of the participants were full-time faculty members ($M= .58, SD =.497$). This shows that the participants in the study were mainly employed as full-time faculty. The Percentage of Online Teaching Load was forty-six percent ($M=45.77, SD =30.854$). This shows that almost half of the teaching load of participants in this study was in an online format.

In addition, twenty-nine percent of the faculty members were teaching courses in the STEM Fields ($M= .29, SD =.456$). This suggests that almost one-third of participants in the study taught in the fields of science, technology, engineering, and mathematics.
Table 4.0

*Descriptive Statistics for the Demographic Characteristics, N = 100*

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>n</th>
<th>Min</th>
<th>Max</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching years</td>
<td>79</td>
<td>1</td>
<td>15</td>
<td>6.38</td>
<td>3.697</td>
</tr>
<tr>
<td>Full-time or Part-time</td>
<td>81</td>
<td>0</td>
<td>1</td>
<td>.58</td>
<td>.497</td>
</tr>
<tr>
<td>Online teaching load (%)</td>
<td>78</td>
<td>0</td>
<td>100</td>
<td>45.77</td>
<td>30.854</td>
</tr>
<tr>
<td>STEM field</td>
<td>76</td>
<td>0</td>
<td>1</td>
<td>.29</td>
<td>.456</td>
</tr>
</tbody>
</table>

**Reliability Analysis**

Reliability of the survey instrument was examined after collecting the data from all of the participants. Reliability is a measurement generally associated with the stability and consistency of research scores. Reliability is concerned with the likelihood of measurement producing the same results within “multiple times at different times” (Creswell, 2012). “A goal of good research is to have measures or observations that are reliable” (Creswell, 2012, p. 159). Reliability of the measure used for this study was enhanced in several ways. First, each respondent completed an identical survey for data collection. This was done to ensure that respondents had a similar understanding regarding the completion of survey items. Second, response categories for the survey items were easy to comprehend and easy to complete. Third, the questions were clear and consistent. Finally, the response categories were based on information found in a review of the literature. Therefore, the literature review served as a guide for what the study was concerned in building upon (Creswell, 2012).
Cronbach’s Alpha was used to examine the reliability as well as internal consistency and is defined as “the proportion of a scale’s total variance that is attributable to a common source, presumably the true score of a latent variable underlying the items” (DeVellis, 2003, p. 31). Simply stated, alpha may range in value from 0.0 to 1.0 and reliability coefficient values greater than or equal to 0.7 are generally accepted as indicative of a reliable scale (Salkind, 2012). Cronbach's Alpha was performed to provide an indicator of internal reliability and the results appear in Table 4.1. The reliability analysis showed that Cronbach’s Alphas for the four domains (i.e., institutional policies and practices, professional development and training, technology support services, and faculty awareness) were .86, .92, .75 and .83, respectively, indicating adequate internal consistency. Analysis yielded moderate to good inter-rater reliability (.75 to .92) across all the scales.

Table 4.1

*Cronbach’s Alpha by Domain*

<table>
<thead>
<tr>
<th>Domain</th>
<th>α</th>
</tr>
</thead>
<tbody>
<tr>
<td>Institutional Policies And Practices</td>
<td>.86</td>
</tr>
<tr>
<td>Professional Development And Training</td>
<td>.92</td>
</tr>
<tr>
<td>Technology Support Services</td>
<td>.75</td>
</tr>
<tr>
<td>Faculty’s Awareness</td>
<td>.83</td>
</tr>
</tbody>
</table>
Results of $t$ tests

A series of paired $t$ tests were used to compare the mean ratings of faculty’s perceived importance, and the mean ratings of their satisfaction with the three key domains, namely institutional policies and practices, professional development and training, and technology support services, so as to answer the first three research questions.

Research Question # 1: Is there a significant difference between faculty importance ratings and satisfaction ratings of institutional policies and practices regarding student authentication and authenticity in online learning?

Research Question # 2: Is there a significant difference between faculty importance ratings and satisfaction ratings of professional development and training regarding student authentication and authenticity in online learning?

Research Question # 3: Is there a significant difference between faculty importance ratings and satisfaction ratings of technology support services regarding student authentication and authenticity in online learning?

A mean ($M$) “is the total of the scores divided by the number of scores” (Creswell 2012, p. 184). Standard deviation ($SD$) “is an indicator of the dispersion or spread of the scores” (Creswell 2012, p. 186). A $t$ test is a statistical examination of two population means (Creswell 2012). Degrees of freedom ($df$) “is the number of scores in a sample that are independent and free to vary” (Creswell, 2012, p. 190). A $p$ value is a statistical value that details how much evidence there is to reject the most common explanation for the data set (Creswell, 2012). Effect Size (Cohen’s $d$) is a means for identifying the
practical strength of the conclusions about group differences or about the relationship among variables (Creswell, 2012).

The results were analyzed using a paired-samples $t$ test. An alpha level of .05 was set incorporating a two-tailed significance level. The mean difference scores between the level of importance and satisfaction showed that there was a significant difference between what faculty find important and their actual level of satisfaction. A series of dependent $t$ tests (see Table 4.2) showed that on average, online faculty members had significantly higher importance ratings ($M = 3.18$) than their satisfaction ratings for institutional policies and practices ($M = 2.31$), $t (82) = 6.06, p < .01, d = .66$; online faculty members had significantly higher importance ratings ($M = 3.89$) than their satisfaction ratings ($M = 2.62$) for professional development and training; $t (77) = 8.20, p < .01, d = .80$; and online faculty members had significantly higher importance ratings ($M = 3.95$) than their satisfaction ratings ($M = 2.29$) for technology support services, $t (74) = 9.08, p < .01, d = 1.04$. Since each of the $d$ values was greater than .50, the effect sizes were large according to Cohen (1988). The results indicate that there were significant differences between the faculty’s perceived importance and their level of satisfaction in the three key domains of student authentication and authenticity in online learning.
Table 4.2

Results from Dependent t tests on the Differences between the Means of Online Faculty’s Ratings on Importance and Satisfaction for the Three Domains of Student Authentication and Authenticity

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>t</th>
<th>df</th>
<th>p</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Institutional policies &amp; practices</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Importance-Satisfaction</td>
<td>0.86</td>
<td>1.30</td>
<td>6.06</td>
<td>82</td>
<td>0.00</td>
<td>0.66</td>
</tr>
<tr>
<td>Professional development &amp; training</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Importance-Satisfaction</td>
<td>1.27</td>
<td>1.37</td>
<td>8.20</td>
<td>77</td>
<td>0.00</td>
<td>0.80</td>
</tr>
<tr>
<td>Technology support services</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Importance-Satisfaction</td>
<td>2.65</td>
<td>1.58</td>
<td>9.08</td>
<td>74</td>
<td>0.00</td>
<td>1.04</td>
</tr>
</tbody>
</table>

Analysis of Faculty Awareness

Descriptive statistics were used to determine the degree of online faculty’s awareness of the importance of student authentication and authenticity in online learning, so as to answer the fourth research question.

Research Question # 4: To what extent are online faculty members aware of the importance of student authentication and authenticity in online learning?

The questions in the survey were divided into five different categories, and the first category focused on faculty awareness. A five-point Likert-type scale, ranging from “Very Important” to “Not important at all” (5 = Very Important, 4 = Important, 3 = Neutral, 2 = Unimportant, 1 = Not important at all) was used for faculty awareness of student authentication. The “Does not apply” choice was also given to respondents. Table 4.3 shows that the grand mean rating of nine questions regarding faculty awareness
was 3.86, suggesting that online faculty members, in general, were fairly aware of the importance of student authentication and authenticity in online learning.

Table 4.3 lists the individual items of faculty awareness sorted in descending order. There were five items that had a mean score of four or above, showing that the faculty members were highly aware of verification of student identity in online courses and possible impersonation of enrolled students.

There were three items that had a mean score between three and four, showing that faculty were moderately aware of responsibility of the Information Technology Office, the regular modification of course assignments by faculty, and the responsibility of the Online Education Office.

Lastly, the table lists one item of faculty awareness that had a mean score below three, showing that the faculty had low awareness of the responsibility of faculty members for student authentication.

The item “The authentication of students in online courses is verified” has a mean of 4.34, which means that a majority of faculty respondents in the present study, believed that the authentication of students must be verified. McCabe, Treviño, & Butterfield (1999) study identified that “pressure to get high grades, parental pressures, a desire to excel, pressure to get a job, laziness, a lack of responsibility, a lack of character, poor self-image, a lack of pride in a job well done, and a lack of personal integrity” (as cited in McCabe et al., 2001, p. 228) can influence academic dishonesty. The results of this study indicated that faculty members were highly aware of the importance of having a secure student verification process in place to combat academic dishonesty.
Table 4.3

Mean Rating on Faculty’s Awareness of the Importance of Student Authentication and Authenticity in Online Learning (In Order of Ranking)

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty’s awareness of authentication and authenticity (the grand mean)</td>
<td>3.86</td>
</tr>
<tr>
<td>The authentication of students in online courses is verified at my campus.</td>
<td>4.34</td>
</tr>
<tr>
<td>Faculty are aware of the possibility that students who register for online classes may not be the same ones who do the work and receive the academic credit.</td>
<td>4.30</td>
</tr>
<tr>
<td>Impersonating an enrolled student in an online course is treated as a moral issue.</td>
<td>4.29</td>
</tr>
<tr>
<td>Faculty are aware of academic honesty differences in online and traditional courses.</td>
<td>4.04</td>
</tr>
<tr>
<td>Technology is used for student authentication in online courses.</td>
<td>4.00</td>
</tr>
<tr>
<td>The Information Technology Office is responsible for student authentication.</td>
<td>3.65</td>
</tr>
<tr>
<td>The faculty changes online course assignments each semester to combat online dishonesty.</td>
<td>3.63</td>
</tr>
<tr>
<td>The Online Education Office/Department is responsible for student authentication.</td>
<td>3.58</td>
</tr>
<tr>
<td>Faculty are responsible for student authentication.</td>
<td>2.96</td>
</tr>
</tbody>
</table>

The item “Faculty members were aware of the possibility that students who register for online classes may not be the same ones who do the work and receive the
academic credit” had a mean of 4.30, which means a majority of faculty respondents believed that faculty are aware of the possibility that students who register for online classes may not be the same ones who do the work and receive the academic credit.

“Probably the most serious problem with online assessment is confirming that the student is in fact who they say they are” (Rowe, 2004, p. 6). It is important for faculty members to ensure that the course grade reflects the student’s ability. The results of this study also indicated that faculty members were highly aware of the existence of substitute course takers. In addition, Rowe (2004) stated, “If an institution claims to provide a service, they must prove to society that they do have some assessment mechanism. Otherwise, their reputation will suffer—reputation is very important for today’s educational institutions—and accreditation can be denied. So accurate assessment methods help insure the survival of educational institutions” (Rowe, 2004, p. 2).

The item “Impersonating an enrolled student in an online course is treated as a moral issue” had a mean of 4.29, which means a majority of faculty respondents believed that the issue of impersonating an enrolled student in an online course needs to be treated as a moral issue.

To build an ethical community, Treviño and McCabe (1994) suggested that creating a hidden curriculum that enables students to receive formal ethics instruction, to learn and discuss ethical issues, and to act on them will allow students to participate in many opportunities for teaching and learning about ethical issues. In those educational institutions, messages about ethics and values are sent to and received by students, both in and out of the classroom (Treviño & McCabe, 1994).
The item “Faculty were aware of academic dishonesty differences in online and traditional courses” had a mean of 4.04, which means a majority of faculty respondents in the present study believed that there was a difference between academic honesty in online and traditional courses. According to Kitahara and Westfal (2007), “While the challenge to protect Academic Integrity is common to course offerings in both the online and traditional (in-class) environments, courses presented in a purely DL environment present special concerns for implementation of protective measures” (para. 2). The results of this study also indicated that faculty were highly aware of a significant difference between academic honesty in online and traditional courses.

The item “Technology is used for student authentication in online courses” had a mean of 4.00, which means a majority of faculty respondents believed that technology needs be used to verify student authentication in online courses. At first, when the Higher Education Opportunity Act of 2008 legislation required institutions that offer online courses to have processes in place that verify or authenticate that the student who registers in a course is the same student who participates in and completes the course, everyone thought that the bill was suggesting institutions of higher learning had to adopt sophisticated and expensive technology. In fact, this is not really the case. In reality, the accreditors are required to ensure that institutions are using, at a minimum, a secure login and pass code or proctored exam. In addition, as online course offerings grow, institutions use new identification technologies and practices.

The item “Information Technology Office is responsible for student authentication” had a mean of 3.65, which means a majority of faculty respondents believed that it is important for the Information Technology Office to be responsible for
student authentication. Moini and Madini (2009) examined the role of biometrics for continually verifying the identity of remote users and defending against impersonation attacks. The findings of this study concur with what they suggested in their study, “traditional weak authentication mechanisms and security countermeasures no longer suffice when dealing with insider threats posed by malicious users” (p. 475).

The item “Faculty changes online course assignments each semester to combat online dishonesty” had a mean of 3.63, which means a majority of faculty believed that it is important for online faculty to change their online course assignments each semester to combat substitute course takers. According to Trenholm (2006), “While there should be clear institutional guidelines and real penalties for cheating, there are also pedagogical techniques that can specifically promote academic integrity in this (online) environment. Prevention is the first line of defense in dealing with cheating online” (p. 293).

The item “The Online Education Office/Department is responsible for student authentication” had a mean of 3.58, which means a majority of faculty respondents believed that it is important for the Online Education Office/Department to be responsible for student authentication. Student authentication is mandated by the federal government and assures academic integrity. As a result of regulations stemming from the federal reauthorization of 2008 Higher Education Act, Online Education Offices/Departments have instituted different strategies to address student authentication. Teaching in the College’s Learning Management System (LMS), securing the LMS with unique usernames and passwords, use of LMS tools, including a student authentication statement in each course syllabus as well as the colleges’ handbook, proctored examinations, plagiarism detection software and browser lock-downs, use of LMS tools, teaching only
as a hybrid model, encouraging faculty to utilize a variety of instructional and assessment strategies, and random personal history questions are among the many different strategies that the Offices/Departments of Online Education have utilized.

The item “Faculty members are responsible for student authentication” had a mean of 2.96, which means a majority of faculty respondents believed that faculty members are not responsible for student authentication. Western Interstate Commission for Higher Education (2009) suggested that the use of multiple assessment techniques, greater reliance on written assignments and threaded discussions, use of test banks, timed test delivery, and raising awareness among students about what constitutes academic dishonesty in an online course promotes academic integrity.

**Results of Multiple Regression**

The multiple regression analysis was run to predict the influence of variables on faculty’s awareness about student authentication and student authenticity, so as to answer the last research question.

Research Question # 5: How well does the combination of faculty background characteristics, institutional policies and practices, professional development and training, and technology support services predict faculty awareness of the importance of student authentication and authenticity in online learning?

The standardized regression coefficients (Beta) is usually done to answer the question of which of the independent variables has a greater effect on the dependent variable in a multiple regression analysis. The unstandardized coefficients (B) are used for making a prediction, using the independent variables. The standard error of the computed value of B is called SEB (Creswell, 2012).
Table 4.4 reports the results of the multiple regression analysis. The multiple regression analysis was conducted to examine the relationship between independent variables (years teaching online courses, teaching classification as full-time or part-time, online teaching load, discipline area as STEM or other fields, importance of policies and practices, importance of professional development and training, importance of support services) that will influence the dependent variable (faculty awareness). $R$ is called Multiple Correlation and measures the relationship between the dependent (criterion) variable and independent (predictor) variables (Tanner, 2012). “$R^2$ is the proportion of either variable explained by the other” (Tanner, 2012, p. 272). The Adjusted $R^2$ is a modification of $R^2$ that adjusts for the number of explanatory terms in a model (Tanner, 2012).

The combination of the variables significantly predicted the faculty’s awareness of the importance of student authentication and authenticity in online learning, $F(7,31) = 2.64, p < .05$. The adjusted $R^2$ indicated that 23% of the variance in faculty awareness was accounted for by the model, presenting a medium or typical effect size (Cohen, 1988). Of the four personal background variables, being full-time faculty was a significant predictor. Of the importance ratings on the three key list (policies and practices, professional development, and technology support services), institutional policies and practices had significant influence on faculty awareness. The faculty respondents who assigned a higher rating to the importance of institutional policies and practices had a higher awareness of the importance of student authentication and authenticity in online learning.
Table 4.4

Summary of the Multiple Regression Analysis

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SEB</th>
<th>β</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>2.903</td>
<td>.492</td>
<td></td>
</tr>
<tr>
<td>Years of teaching</td>
<td>-.044</td>
<td>.023</td>
<td>-.276</td>
</tr>
<tr>
<td>Full-time status</td>
<td>.758</td>
<td>.365</td>
<td>.360*</td>
</tr>
<tr>
<td>Percentage of online teaching load</td>
<td>.006</td>
<td>.004</td>
<td>.257</td>
</tr>
<tr>
<td>Teaching courses in the STEM fields</td>
<td>-.144</td>
<td>.214</td>
<td>-.109</td>
</tr>
<tr>
<td>Importance of policies and practices</td>
<td>.255</td>
<td>.095</td>
<td>.533*</td>
</tr>
<tr>
<td>Importance of professional development</td>
<td>.141</td>
<td>.078</td>
<td>.334</td>
</tr>
<tr>
<td>Importance of technology support services</td>
<td>-.203</td>
<td>.109</td>
<td>-.424</td>
</tr>
</tbody>
</table>

Note: $R^2 = .37$; $F(7,31) = 2.64$, $p < .05$.

* $p < .05$.

Summary

This chapter reviewed the results of this researcher’s study. The data analysis began with descriptive statistics that included the faculty member’s demographic characteristics, followed by the faculty member’s awareness of student authentication. In addition, the results of correlations and regression were used to examine the relationship between the dependent variable and independent variables.

Overall, faculty members were fairly aware of student authentication and student authenticity challenges. However, this researcher’s findings indicated that more institutional policies and practices, faculty training, and support services would greatly
increase faculty understanding of student authentication and authenticity in online learning at California community colleges.

Research questions one, two, and three indicate that there were significant differences between the faculty’s perceived importance and the level of satisfaction in the three key domains of institutional policies and practices, professional development and training, and technology support services regarding student authentication and authenticity in online learning. Community colleges must send a consistent message to their students that academic integrity is expected and that impersonating others will result in negative consequences both academically and disciplinary. To combat academic dishonesty and establish a proper climate, the long-term solutions must be planned, including well-defined standards and clear communication of these rules and standards (McCabe et al., 2001). Without faculty support and their continuous engagement, these changes simply cannot take place. In order to improve curricula and programs, faculty training is also required.

Research question four indicates that the grand mean rating on faculty’s awareness (the importance of the perceived problem) was 3.86, suggesting that the online faculty members, in general, were fairly aware of the importance of student authentication and authenticity in online learning. Faculty members were aware that the integrity of the scholastic process should not be compromised.

Research question five indicates that out of four personal background variables, being a full-time faculty was a significant predictor. Of the importance ratings on the three key domains, institutional policies and practices had significant influence on faculty’s awareness. Consequently, the higher the faculty’s rating on the importance of
institutional policies and practices, the higher their awareness of the importance of student authentication and authenticity in online learning would be.
Chapter V: Discussion and Conclusions

Introduction

This chapter contains a summary of the study, discussion, implications for policies and practices, recommendations for future research, and concluding statements.

Summary of the Study

Student authentication is a complicated process. In the current study, the researcher was able to identify some factors that faculty take into consideration when faced with the effectiveness of student authentication and authenticity in online learning at community colleges. Further research should consider other data collection techniques that might provide other insights regarding the findings of this study.

Tests and assignments are commonly used as online assessment tools, but they do not provide the same level of confidence as face-to-face assessments of student learning. One noticeable challenge, far from being solved, is the lack of proper mechanisms to avoid academic dishonesty during online course assessment. Student verification and academic honesty in online education are complex issues for the educational community. Different stakeholders at different levels (such as Federal and State government, accreditation agencies, academic institutions, administrators, staff, faculty, and students) have been working to address the issue of student authentication. Each stakeholder group raises its own issues related to this problem.

The purpose of this study was to examine the effectiveness of student authentication and authenticity in online learning at California community colleges through the faculty’s perceptions of the three key institutional factors: (a) policies and practices, (b) professional development and training, and (c) technology support services.
The researcher also examined the degree to which faculty members are aware of the importance of student authentication and authenticity. Quantitative data was collected through an online survey that was completed by 100 California community college online faculty members. Their range in years of teaching online was from one to fifteen years with an average of 6.38 years. Fifty-eight percent of the participants were full-time faculty members, of whom, 46% of their teaching load was online. In addition, 29% of the faculty members were teaching courses in the STEM fields.

Participation was voluntary and respondents’ identity remained anonymous. Individual online faculty members were the focus of this study and the researcher used a non-probability random sampling. The prospective respondents were identified and contacted by 1) snowball sampling; 2) the colleges’ online education Web sites; 3) the Etudes’ faculty Web site; and 4) LinkedIn’s professional Web site. A forty-six-item questionnaire including a combination of forty-five closed-ended questions and one open-ended question was drafted.

The survey questions developed were designed to answer the following research questions and were focusing on faculty perceptions.

1. Is there a significant difference between faculty importance ratings and satisfaction ratings of institutional policies and practices regarding student authentication and authenticity in online learning?

2. Is there a significant difference between faculty importance ratings and satisfaction ratings of professional development and training regarding student authentication and authenticity in online learning?
3. Is there a significant difference between faculty importance ratings and satisfaction ratings on technology support services regarding student authentication and authenticity in online learning?

4. To what extent are online faculty members aware of the importance of student authentication and authenticity in online learning?

5. How well does the combination of faculty background characteristics, institutional policies and practices, professional development and training, and technology support services predict faculty awareness of the importance of student authentication and authenticity in online learning?

**Discussion**

Most of the previous research in the field of online education considered the issue of student authentication as an emerging issue. While studying the factors that contribute to student authentication has value, disregarding relationships between these factors prevents us from solving the problem of student authentication and student authenticity. The findings of this study indicate that faculty members are relatively aware of student authentication as well as student authenticity. In addition, the researcher also learned that faculty members had the highest rate of dissatisfaction with technology support services, then institutional policies and practices, and the lowest dissatisfaction rating was for professional development.

This study makes two main contributions to the field of online education. First, it shows the importance of the institutional policies and practices, professional development, technology support services, faculty awareness, and demographic characteristics for the effectiveness of student authentication and authenticity in online
learning in California community colleges. Second, it lends support to show that these variables influence one another, and that their connection with each other contributes to the effectiveness of student authentication and authenticity in online learning (see Figure 5.0). As the following figure indicates, all identified variables influence one another, ultimately influencing the effectiveness of student authentication and student authenticity.

Figure 5.0. The Summary of Current Study

Although the researcher considers this study to be an important additional component in the understanding of student authentication, this study is a first step. To determine if these findings have a broader application, it would be necessary to conduct the same study at community colleges in different parts of United States. Furthermore,
most of the items in this study were based on previous research, but the researcher was able to find very little evidence of rigorous statistical validation of the topic.

The respondents confirmed that the perpetuation of academic integrity is an essential aspect of the education profession. It was further indicated that faculty needed to be familiar with institutional policy and practices to maintain academic integrity. Some important findings emerged from the data analysis conducted as part of this study. This study provided evidence that there were significant differences between what faculty members considered as important in the three areas under question and faculty’s level of satisfaction. In other words, there is a lack of satisfaction in the three key areas of institutional policies and practices, professional development and training, and technology support services at community colleges.

Demographic characteristics provided insights into faculty perspectives. Evidence from this study suggested that community college faculty in general were fairly aware of the importance of student authentication and authenticity.

The issue of identity authentication is not new in higher education any longer. Originally, the focus of federal policies and regulations concerning student’s authentication was on academic dishonesty. But due to several large financial aid fraud cases, the issue of identity authentication has recently gained the attention of federal agencies (California Community Colleges Chancellor’s Office, 2011). Thus, the federal government used its legitimate power through the passage of the Higher Education Opportunity Act of 2008 to place new responsibilities on regional accrediting commissions to ensure that colleges provide quality online education as well as student services such as online tutoring and remote access to campus resources.
In turn, the regional accrediting bodies set high standards to scrutinize the quality control of online programs during accreditation and reaccreditation visits. Now, accrediting agencies are looking at why online education courses are being offered at an institution, and they check to see whether institutions have established the structures needed to support their online education initiatives. In addition, they look for integration of administrative structures, planning and oversight mechanisms, and online programs that take place in the framework of existing academic programs.

Thus, the federal government, along with accreditation agencies, are taking Kant’s Categorical Imperative approach: to do what is right no matter what the cost is (Johnson, 2012). As everyone involved with higher education agree that fraudulent behavior and academic dishonesty are amoral behaviors, they also agree that the behaviors should be prevented or punished as they occur.

Institutions and online faculty should strive to deter academic fraud and promote academic integrity by taking an active role in the quest toward honesty. To deter academic dishonesty, students need to be aware of standards of conduct, and, institutions need to take an active role. For example, students can be educated about the importance of academic integrity through a resource center. This approach communicates to students the commitment of the institution to academic integrity, and, it also encourages students to take responsibility for their behavior (McCabe & Pavela, 2000). The institutions and faculty members communicate academic honesty guidelines, violations, and consequences in their students’ handbook, college Web site, newspaper, and course syllabi. While faculty should be aware of academic dishonesty, they also have the responsibility to educate their students on the concept of academic dishonesty and student
authentication. Any misconduct that constitutes academic dishonesty should be clearly explained to students at the beginning of each semester. Faculty members should also create multi-stages of course design (e.g., break larger projects into smaller parts and/or reflective journals), promote collaborative writing, update exams and assignments every semester, know the abilities of each learner and connect with them accordingly. The Information Technology Offices need to provide appropriate technologies for proctored exams (e.g., taking exams at a physical location or using a web cam to monitor students during the exam from a distance), challenge questions, and verification technologies (e.g., biometrics for iris recognition, fingerprinting, or voice recognition). Administrators need to integrate the effectiveness of their online programs into their budgeting, planning, and evaluation systems. The implementation of these changes can make it more difficult for surrogates (course takers) to do all course work for each semester. To deter the likelihood of academic dishonesty occurring, online faculty, administrators, and Information Technology department personnel must work closely with each other to provide, develop, and implement technology and procedures that authenticate online learners.

Implications for Policy and Practice

Promoting academic honesty. Based on this study, the world of online education is changing at a rapid pace. As online education grows, a myriad of questions and concerns arise. Every new generation of students is increasingly technologically perceptive. Students demand that educators utilize technology to deliver relevant information in an efficient manner. Many of our students are nontraditional, attending college on either a part-time or full time basis. Offering online courses allows students to
learn material at their own pace, which encourages them to have better academic performance. Online course instruction will undoubtedly continue to grow in popularity with both traditional and online students. According to the results of a study published by the Distance Education and Training Council (2011), online education is growing quickly at community colleges. “For the 2008-9 academic year, enrollment in online learning at community colleges grew 22 percent over the 2007-8 academic year, up from a growth rate of 11 percent in the previous year” (Miller, 2010, p. 1). However, one major question is: How do you ensure that online education coursework is designed in a way that promotes academic honesty? Teaching is a moral endeavor, because human action is being undertaken with regard to other human beings. According to Moore and Anderson (2003), “If anything threatens the potential success of online education more than the rejection and neglect it has received in the past, it is the danger of overenthusiasm about technology leading to underfunded, undermanned, poorly designed, and poorly managed programs” (p. xxiii). Some institutions are expecting faculty members to put more courses online, even though many of these educators do not have the additional preparation that allows them to succeed in an online environment (Balmert & Ezzell, 2002). The rapid growth of online education contributes to our call for ethical decision-making and ethical policy formation. Hence, issues surrounding student authentication and student authenticity need and demand immediate attention.

Academic integrity policies should promote a unique sense of community on campus at the institutional, classroom, and individual levels. They also should foster a culture of trust, honesty, fairness, responsibility, and respect.
In addition, as Ercegovac & Richardson (2004) assert, it is critical that institutions realize the significance of problems that “are related to students’ state of readiness to understand issues involved in academic dishonesty and plagiarism and in relationships with peers, teachers, and as part of their educational climate as a whole” (p. 310).

Staff charged with the management of an online education program should continue to participate in the dialogue about authentication within the online education community, sharing issues and solutions related to academic integrity in virtual learning environments. The ongoing effort will allow campuses to meet the legislated authentication requirements, and to go beyond them to create ethical learning communities. (McNabb, 2010, p. 51)

**Course design to promote academic honesty.** Faculty awareness indicated that it is important for online faculty to change their online course assignments each semester to combat substitute course takers. According to Christe (2003), syllabus, content presentation, student/instructor relationship, assessment design, and monitoring are five general areas of an online course design that need to be re-examined every semester to encourage student honesty. “Doing so will prevent a carbon copy of a course being presented to the next group of students” (Christe, 2003, p. 55). It is reasonable to believe that as course assignments remain the same, there will be more opportunities to have surrogates in a course. It might also be that as classes become more difficult, students, would feel more pressure to work with course takers in order to earn the grades they desire. When course takers become more savvy and familiar about ways to cheat, it will essential to involve assessments that require critical thinking and application, rather than memorization. One of the implications of this study is that the impersonation of a student
needs to be addressed at the institutional level. Another implication is that faculty may deter academic dishonesty by re-structuring courses regularly.

When students are new to online education, they are unfamiliar with the learning environment. This unfamiliarity often results in receiving help from course takers. As students gain a better understanding of how online classes are run, they become more comfortable with the level of their own knowledge in the virtual classroom, and are less focused on working with a course taker. Faculty can motivate students by creating a sense of connectedness with students, and helping them to focus on their academic work. This approach will serve as a deterrent for academic dishonesty.

**Promoting ethical responsibilities.** The findings of this study confirm the need for faculty, staff, and administrators to work closely together to restrain unethical behavior in their institutions. Online learning necessitates the use of a code of ethical conduct that is practiced by all those involved in higher education. Success is ultimately a human responsibility (Russell, 2006), as each stakeholder contributes his part. The ultimate goal is quality learning, and this can be achieved when everyone acknowledge the individual and collective ethical responsibilities that come with their role. “While technologies are becoming more complex and their ability to extract and manipulate information about the individual even greater, a code of ethics compels us to develop both a more straightforward and more wide-reaching approach” (Baggio & Belderrain, 2011, p. 32).

As technologies continue to evolve, it would be wise for decision makers to be aware of the following procedures:
1. Faculty members are responsible for developing a code of ethics aiming at minimizing academic dishonesty, which also communicates ethical/moral expectations as well as the repercussions of committing acts of plagiarism with their students. According to McCabe and Treviño (1997, as cited in McCabe et al., 2001) a significant factor that is a deterrent to cheating is the “perceived severity of penalties for cheating” (p. 222).

2. Academic integrity and ensuring that all students are safe and protected from harm are the ethical responsibility of institutions.

3. Stakeholders, such as faculty, administrators, students, and staff, need to realize that their role has changed, and they are responsible for developing a “shared vision” on ethical issues that promotes quality learning.

**Developing adequate policies and practices.** Although some faculty members at a non-required departmental level have taken some preventive measures to curtail substitute course takers, clarifying what constitutes academic dishonesty so that students do not commit the offence as a result of ignorance is crucial. Colleges are required to follow federal, state, and local regulations. They also have to author their own standard operating procedures that provide guidelines for the college community to follow. Policies concerning subject identification procedures are necessary for community colleges. As technology constantly evolves, colleges need to alter their institutional policies and practices accordingly. Institutional academic integrity policies and practices can have a significant influence on students’ behavior and faculty decisions regarding suspected academic dishonesty.
To encourage actions and policies that promote and justify the values of academic integrity, the Center for Academic Integrity (1999) developed seven recommendations:

1. Have clear academic integrity statements, policies, and procedures that are consistently implemented.

2. Inform and educate the entire community regarding academic integrity policies and procedures.

3. Promulgate and rigorously practice these policies and procedures from the top down, and provide support to those who faithfully follow and uphold them.

4. Have a clear, accessible, and equitable system to adjudicate suspected violations of policy.

5. Develop programs to promote academic integrity among all segments of the campus community. These programs should go beyond repudiation of academic dishonesty and include discussions about the importance of academic integrity and its connection to broader ethical issues and concerns.

6. Be alert to trends in higher education and technology affecting academic integrity on its campus.

7. Regularly assess the effectiveness of its policies and procedures and take steps to improve and rejuvenate them. (P. 10)

McCabe (1993) reported that almost 25% faculty, in his study, expressed dissatisfaction with the institutional policy. In addition, McCabe et al. study (1999) also verified that faculty who worked in honor code environments were more supportive of their institutions’ academic integrity policies. The implication of findings for community colleges is that it is crucial to invest time and effort on policies and practices, professional
development and training, and technology support services to improve the effectiveness of student authentication and authenticity in online learning. The institutions’ academic integrity policies need to be more effective and specifically spell out the institution’s student authentication policies. Also, it is worthwhile to increase faculty’s awareness of student authentication policies through professional development training.

**Recommendations for Future Research**

This study was one of the few that investigated the issues surrounding student authentication and authenticity. Further study and research needs to be completed. Limitations present in this study include not being able to collect information from all faculty members from each California community college, which may limit the generalizability of the results.

The respondent’s comments indicated that their institutions had to identify proper strategies to truly authenticate their online students. However, respondents strongly believed that impersonating a student in an on-campus class is probable and online courses should not be treated different than onsite classes. Faculty felt that there was a need to authenticate students regardless of the course delivery method.

In conclusion, student authentication is an important matter and further research is necessary on this topic. For further research, the researcher proposes the following plan:

1. Research needs to be conducted to understand what kinds of policies and strategies are more effective in different contexts to prevent academic dishonesty in online courses.
2. Research needs to be conducted to understand the relationship between the cases of academic honesty violation and demographic factors. These efforts will attempt to identify significant trends in academia’s views of ethical behavior.

3. Research needs to be conducted to understand the student perceptions of student authentication in an online environment, so faculty and students’ perspectives can be compared.

4. Through multi-college collaborations with other researchers, the researchers need to compare various approaches to student authentication and authenticity and establish effective solutions.

5. As newer technologies are used for online offerings, research needs to be conducted to determine the impact of technology in the online environment.

6. Conduct a comparative study to understand the issue of student authentication and authenticity in online and on-campus learning environments.

7. Replicate the study, drawing a sample from more than one state and not limiting the study only to community college faculty. By expanding the breadth of the research, the results will be more applicable to various types of colleges and universities.

8. Perform an analysis of online academic dishonesty cases that have occurred in different community colleges. This will offer some insight into the frequency of occurrence, reporting, and handling of incidences of academic dishonesty.

9. Conduct an in-depth qualitative study with faculty teaching online classes. Interviewing faculty will provide additional insight into improving the quality of online teaching.
10. Conduct a study of current professional development and training offered to faculty before teaching online classes and continued professional development opportunities while they are teaching, so recommendations for future programs can be developed.

11. Research the role of course design in creating an educational environment that discourages students from working with course takers. Both quantitative and qualitative research would be beneficial in exploring the role of course designs.

12. Conduct a study to understand the site administrators’ perceptions of the importance of institutionalizing policies, training, and support services for student authentication and authenticity.

**Concluding Statement**

As online learning gains greater acceptance, many academic institutions are challenged with preserving the integrity of the educational process. The inability to authenticate remote users in online courses and the lack of proper mechanisms to avoid academic dishonesty remain as major concerns to policy makers, accrediting agency leaders, administrators, and faculty. It is imperative that online education courses be of high quality and equivalent to courses offered onsite. The results discussed in this study focused on how institutions should implement online education so that it is honest, ethical, fair and consistent with traditional education. The effectiveness of online learning was analyzed in the areas of institutional policies and practice, professional development and training, and technology support services. The analysis revealed that the problem of student identification and academic dishonesty is a critical issue in higher education.
Community colleges cannot expect students not to violate the rules of academic honesty unless these institutions develop and implement clear and comprehensive policies and procedures. Everyone involved in online learning needs to accept her or his responsibility for the roles they play and their impact on student learning. According to the Center for Academic Integrity (1999), “The call to promote academic integrity places responsibility upon everyone in the educational community to balance high standards with compassion and concern” (p. 10). To maintain academic integrity is the collective responsibility of all stakeholders. For example, administrators are responsible for providing training for faculty and students, Information Technology is responsible for maintaining the infrastructure, and faculty are responsible for designing courses that promote authenticity.

According to Campus Technology (2011), the quality issues need to be studied in three areas: 1) instruction (e.g., roles of faculty, curriculum design, engagement in learning process, clarity of and comparability of learning outcomes); 2) learning support (e.g., sufficiency of educational resources such as library and labs availability and range of standard student services, including remediation, tutoring, availability of effective technical support); and, 3) institutional commitment and capacity (e.g., fit to mission, investments in training, integration into budgeting, planning, academic and student evaluation systems). Even so, obtaining additional funding for new technology in today’s economy can be challenging for community colleges.

There is considerable evidence in this study that institutional policies and practices, faculty professional development and training, and technological support services can be improved by responding to the needs of faculty members. As California community
colleges continue to move from onsite to online programs, they need to provide students access to a rich and effective learning environments. Effective academic policies ensure that academic integrity is upheld. Some of the challenges of online education are new to community colleges, therefore, institutional policy, faculty training, technology support services, and attention to the quality of online education are important components of a successful online educational program. In order for the online programs to be fully integrated into the institutional programs of the college, it is vital for online faculty to have an adequate degree of support. The growth of online education means greater student access, student success, and increased student enrollment for the college. According to Kezar, one of the pioneers in organizational change, “It is widely acknowledged in the literature on change that support from the president and other individuals with positional power promotes the change process because they can secure human and financial resources and focus institutional priorities” (Kezar, 2001, p. 105).

The growth of online courses and programs has increased the need for community colleges to gain the necessary resources for students and faculty to make online courses a success. This can be accomplished through an ongoing collaboration and training of campus communities. By giving institutional support and providing resources to online programs, community colleges are in an excellent position to serve the needs of their online learners.
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Appendix A

Email Message

Hi,

May I please ask you to complete the following survey, and forward the “survey invitation” to your colleagues who have taught or are currently teaching fully online courses at any of the California Community Colleges?

Thank you for your time and participation,

Mitra Hoshiar

Doctoral Candidate

Educational and Leadership Policy Studies, CSU Northridge

818-710-4223
Appendix B

Survey Invitation

Effectiveness of Student Authentication and Student Authenticity in Online Learning at California Community Colleges

You, as an online faculty who have taught fully online course(s) at a community college, are invited to participate in a study of The Effectiveness of Student Authentication and Student Authenticity at California Community Colleges in Online Learning.

This project is designed to provide an understanding about what institutional support will enhance faculty's awareness in an online mode of instruction. My name is Mitra Hoshiar, and I am a doctoral candidate at California State University, Northridge, Department of Educational Leadership and Policy Studies. This survey is a part of my doctoral dissertation study. If you have any questions about this research, you can reach me at hoshiam@piercecollege.edu. If you have any question about the research process, please contact Research and Sponsored Projects, California State University, Northridge, 18111 Nordhoff, Northridge, CA 91330-8232, or phone (818) 677-2901.

Participation is voluntary and your identity will remain anonymous. You will not be asked to provide the name of your college but you will be asked for your academic discipline, which you may decline to state. You may discontinue participation at any time while taking the survey, and you are also allowed to skip questions. Should you decide to participate, you are asked to complete an anonymous survey that should take approximately 10 minutes to complete. This is an online survey administered through SurveyMonkey, a web-based Software Company that has the capability to confidentially collect and record your responses. SurveyMonkey will not record nor reveal the names of respondents and their institutions. At no time will your name or institution be identified in reports, papers, or publications. This study is done for educational purposes only. These data will provide important information about the future design and direction of online education.

The link to the survey: https://www.surveymonkey.com/s/Mitra_Survey
Appendix C

Web Survey

Effectiveness of Student Authentication and Authenticity in Online Learning at Community Colleges

Directions: Please click on or fill in the response that most represents your experience or opinion. You may change your response by clicking on an alternative choice, but you will not be able to respond with more than one answer. When you have completed the entire survey, click on Submit. Thank you for your participation.

1. Faculty Awareness

For each item or statement listed below, please tell us how important it is to prevent academic dishonesty in online courses.

5 = Very Important
4 = Important
3 = Neutral
2 = Unimportant
1 = Not important at all
0 = Does not apply

1. The authentication of students in online courses is verified at my campus.
2. Faculty are aware of academic honesty differences in online and traditional courses.
3. Impersonating an enrolled student in an online course is treated as a moral issue.
4. Faculty are aware of the possibility that students who register for online classes may not be the same ones who do the work and receive the academic credit.
5. Technology is used for student authentication in online courses.
6. Faculty are responsible for student authentication.
7. The Information Technology Office is responsible for student authentication.
8. The Distance Education Office/Department is responsible for student authentication.
9. The faculty changes online course assignments each semester to combat online dishonesty.

2. Institutional Policies and Practices

Please indicate the level of IMPORTANCE to you on each of the following statements.

5 = Very Important
4 = Important
3 = Neutral
2 = Unimportant
1 = Not important at all
0 = Does not apply

10. My college has a clear and adequate policy on student authentication.
11. My college is actively looking for new strategies to verify student authentication.
12. My college uses different sources (e.g., college website, online orientation, campus newspaper) to communicate the institutional policies and processes related to student authentication.
13. Faculty use diverse sources (e.g. syllabus, course website, email, chat, first class session) to communicate the institutional policies and processes related to student authentication.
14. My college requires a proctor at an off-site location convenient to the student for tests.
15. My college uses webcams to monitor students while taking exams.
16. My college enforces academic sanctions (a grade of 0 for online dishonesty).
17. My college enforces disciplinary sanctions (dropping the student from the class and/or placing a note in student’s academic record).
18. My college utilizes a third-party-designed security questions that are answered at the beginning of the semester and then reappear randomly while students are logged into the course (student verification questions).
19. My college utilizes student-designed (personal verification questions) that are answered at the beginning of the semester and then reappear randomly while students are logged into the course (e.g., mother’s maiden name).

Please indicate how SATISFIED are you with each of the following statements.

5= Very Satisfied
4 = Satisfied
3 = Neutral
2 = Dissatisfied
1 = Very Dissatisfied
0= Does not apply

20. My college has a clear and adequate policy on student authentication.
21. My college is actively looking for new strategies to verify student authentication.
22. My college uses different sources (e.g., college Web site, online orientation, campus newspaper) to communicate the institutional policies and processes related to student authentication.
23. Faculty use diverse sources (e.g. syllabus, course Web site, email, chat, first class session) to communicate the institutional policies and processes related to student authentication.
24. My college requires a proctor at an off-site location convenient to the student for tests.
25. My college uses webcams to monitor students while taking exams.
26. My college enforces academic sanctions (a grade of 0 for online dishonesty).
27. My college enforces disciplinary sanctions (dropping the student from the class and/or placing a note in student’s academic record).
28. My college utilizes a third-party-designed security questions that are answered at the beginning of the semester and then reappear randomly while students are logged into the course (student verification questions).
29. My college utilizes student-designed (personal verification questions) that are answered at the beginning of the semester and then reappear randomly while students are logged into the course (e.g., mother’s maiden name).
3. Faculty Professional Development and Training

Please indicate the level of IMPORTANCE to you on each of the following statements.

5 = Very Important
4 = Important
3 = Neutral
2 = Unimportant
1 = Not important at all
0 = Does not apply

30. My college offers faculty orientation and workshops on online academic dishonesty prior to the offer of any online courses.
31. My college offers faculty workshops on new technologies and strategies to prevent online academic dishonesty.
32. My college offers faculty orientation on the policies and the processes related to online academic dishonesty prior to the offer of any online courses.
33. My college offers faculty workshops on various course designs and student engagement strategies (e.g. reflective essays, discussions, mini-assignments, collaborative work, and disaggregated assignments) to prevent online academic dishonesty.

Please indicate how SATISFIED are you with each of the following statements.

5 = Very Satisfied
4 = Satisfied
3 = Neutral
2 = Dissatisfied
1 = Very Dissatisfied
0 = Does not apply

34. My college offers faculty orientation and workshops on online academic dishonesty prior to the offer of any online courses.
35. My college offers faculty workshops on new technologies and strategies to prevent online academic dishonesty.
36. My college offers faculty orientation on the policies and the processes related to online academic dishonesty prior to the offer of any online courses.
37. My college offers faculty workshops on various course designs and student engagement strategies (e.g. reflective essays, discussions, mini-assignments, collaborative work, and disaggregated assignments) to prevent online academic dishonesty.

4. Technology Support Services

Please indicate the level of IMPORTANCE to you on each of the following statements.

5 = Very Important
4 = Important
3 = Neutral
2 = Unimportant
1 = Not important at all
0= Does not apply

38. The Information Technology Office at my college provides support to faculty in regards to student authentication and related technology (e.g., new software, latest technology, and technical support services).

39. The Online Education Office/Department at my college provides support to faculty in regards to student authentication (e.g., financial and/or human resources).

Please indicate how SATISFIED are you with each of the following statements.

5= Very Satisfied
4 = Satisfied
3 = Neutral
2 = Dissatisfied
1 = Very Dissatisfied
0= Does not apply

40. The Information Technology Office at my college provides support to faculty in regards to student authentication and related technology (e.g., new software, latest technology, and technical support services).

41. The Online Education Office/Department at my college provides support to faculty in regards to student authentication (e.g., financial and/or human resources).

5. Demographic Questions

42. How many years have you been teaching fully online courses? ______

43. How is your teaching classification defined in your primary college of assignment?
   a) Full-time  b) Part-time

44. If you are a full-time faculty at this college, then what proportion of your teaching load is fully online? _____

45. In what discipline area are you teaching? ________________________________

46. Do you have any general comments on student authentication and student authenticity?

You have completed the online survey. Thank you for your time and participation. Please click submit.

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Appendix D

Table D1

Summary of Responses for the Qualitative Question

<table>
<thead>
<tr>
<th>Comments on Students Authentication and Student Authenticity</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impersonation happens in onsite classes as well</td>
<td>13</td>
</tr>
<tr>
<td>Course design is the solution</td>
<td>9</td>
</tr>
<tr>
<td>Hard to implement</td>
<td>8</td>
</tr>
<tr>
<td>No resources are available at my college</td>
<td>3</td>
</tr>
<tr>
<td>Proctored exams would be helpful</td>
<td>3</td>
</tr>
<tr>
<td>It is an important issue</td>
<td>3</td>
</tr>
<tr>
<td>The survey is hard to understand</td>
<td>2</td>
</tr>
<tr>
<td>Colleges will be held accountable soon</td>
<td>1</td>
</tr>
<tr>
<td>Thought-provoking survey</td>
<td>1</td>
</tr>
<tr>
<td>Do not understand the term “authentication”</td>
<td>1</td>
</tr>
<tr>
<td>It’s a campus-wide issue</td>
<td>1</td>
</tr>
<tr>
<td>No professional development training is available at my college</td>
<td>1</td>
</tr>
<tr>
<td>Using biometric technologies would be helpful</td>
<td>1</td>
</tr>
<tr>
<td>The majority of students are honest</td>
<td>1</td>
</tr>
<tr>
<td>Appropriate course management system would be helpful</td>
<td>1</td>
</tr>
<tr>
<td>It is administration’s responsibility</td>
<td>1</td>
</tr>
<tr>
<td>Increasing students’ awareness would be helpful</td>
<td>1</td>
</tr>
</tbody>
</table>