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Online Student Validation

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Online Student Validation

A comprehensive evaluation of La Salle University's online authentication systems and processes with recommendations for enhancement.

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1. Introduction

With the Higher Education Opportunity Act, the U.S. Secretary of Education has instituted new requirements for recognition of students enrolled in online programs. This recognition requirement applies to validation that the enrolled student is the same person who completes online assignments, testing and coursework. In order to comply with this requirement, programs must prove that they adhere to their university guidelines for validating online course work or by creating their own policies. This paper first describes online education including its benefits, challenges and problems with cheating, especially in light of federal and accreditation requirements

This paper follows a process that a university technology director would use to evaluate an opportunity for change and the benefits that the change would provide.

The paper then examines La Salle University's online education, technologies and online class design and support resources. The implications regarding online policies, academic integrity and privacy are considered. Solutions to prevent online cheating are described through best practice strategies and technology solutions.

The recommendations in this document consider the current accreditation requirements issued by the U.S Secretary of Education through the Higher Education Opportunity Act (HEOA.)   Several technological solutions are evaluated and compared, focusing on the features that the solutions provide, cost, and the ease of integration into LaSalle University's current systems. Finally, this paper evaluates existing processes and provides recommendations for process optimization.

2. Background

Technology is continually expanding the classroom through online and distance learning. At the same time, online education is changing the learning landscape. Students can now earn a secondary or higher education degree on a part time basis, while continuing to participate in a career or raising a family. Online programs are quickly becoming commonplace in almost all universities, while some schools only offer online programs. According to Dr. Anthony Picciano, professor at The City University of New York, and the Executive Office PhD Program in Urban Education, in 2008 "approximately 4.6 million or twenty-five percent of college and university students enrolled in at least one fully online course." (Picciano, P1) This figure continues to grow today. Table 1-1 indicates the growth rate in online programs:

Table 1-1: Total and Online Enrollment in Degree-granting Postsecondary Institutions, Fall 2002 through Fall 2008. (Picciano, P23)

	Total Enrollment	Annual Growth Rate Total Enrollment	Students Taking at Least One Online Course	Annual Growth Rate Online Enrollment	Online Enrollment as a Percent of Total Enrollment
Fall 2002	16,611,710	NA	1,602,970	NA	9.6%
Fall 2003	16,911,481	1.8%	1,971,397	23.0%	11.7%
Fall 2004	17,272,043	2.1%	2,329,783	18.2%	13.5%
Fall 2005	17,487,481	1.2%	3,180,050	36.5%	18.2%
Fall 2006	17,758,872	1.6%	3,488,381	9.7%	19.6%
Fall 2007	17,975,830	1.2%	3,938,111	12.9%	21.9%
Fall 2008	18,199,920	1.2%	4,606,353	16.9%	25.3%

The growth of online classes can be largely attributed to the convenience and opportunity

that it provides. Universities have identified the value in online classes. While online classes do

provide convenience for the students who struggle with hectic classes, schedules, family

obligations and full/part time jobs, they take the instructor presence out of the classroom and

create opportunities for students to cheat. Cheating on an exam can take place in any course but

the chance of cheating is much greater if the exam is taken online. That is why the testing

integrity in distance learning is a major issue for online education.   If there is no confidence in

your distance learning assessment, the value of the degree can be threatened and academic

integrity could suffer.

In a traditional classroom, cheating is curbed by the presence and review of the teacher.

Online programs tend to have less control or visibility to the students during exams. Therefore

teachers, administration and school systems, and policies need to find the online equivalent to the

traditional proctor. During the current spring semester of 2011, 64 online credit earning classes

were offered at La Salle University. Thirty-five of these classes were part of accredited programs

such as Speech and Language Pathology. Despite this high number of online classes, La Salle

University does not have any mechanisms or procedures, except for secure logins and passwords,

that can ensure that a student who is receiving credit for an online course is the same student who

is completing the required course work. However, La Salle University does have systems in

place that are secured by user names and passwords, and their systems are compliant with federal

regulations and accreditation requirements. It simply means that there is no guarantee that

students are not violating academic codes of conduct when participating in online classes.

Therefore, systems and procedures need to be established to continue credibility of La Salle

University's online programs. Additionally, scholastic programs that are accredited now require

these mechanisms to be in place in order to stay in good standing with the Middle States

Commission on Higher Education accreditation agency. As a result of these changes, individual

programs and schools are searching for a solution that validates that a student taking exams and

submitting class work is the same student who is registered for the class.

3. Online Education

3.1. Benefits

Online programs offer students the opportunity to learn from the comfort of their own

home, regardless of their geographic location to the school. This distance learning opportunity

lets students participate in classes that they would have not been able to attend in person.

Students can participate in a class from a stress free home environment, and in many cases,

perform the work according to their own schedule. Schools are no longer limited by brick and

mortar class rooms, limiting the number of classes that can be conducted at any given time. In

addition, the learning management systems that enable online learning also aid in group work

and collaboration. Students have the ability to meet in synchronous online group meetings, using

microphones, video cameras, texting functionality and other collaboration tools. Students and

universities are finding value in the online experience and as a result the demand for online

learning continues to grow.

3.2. Challenges

While there are several benefits to an online education, the quality and content of the

learning experience continues to be debated. Some skeptics believe that the interpersonal

relationship between students and their teacher or with the students themselves is not as strong in

an online setting as it is in person, hampering the learning process. Others believe that the online

format provides more opportunity for focused student and teacher interaction and can provide a

better learning environment. However, an online education is only as good as the design of the

course. Concerns have been raised that teachers are not as effective when their online teaching

methods are simply direct translations of their in-class curriculum. "There is an immense

difference between putting a course online and redesigning a course by starting from the learning

goals and integrating various forms of knowledge and expertise to build a course that realizes

those goals." (Cox, P1780) It has also been suggested that some underprivileged students may

not have the means or the experience to effectively use online education tools and may be at a

disadvantage as a result.

3.3. Problems with Cheating

One of the biggest concerns with online education is cheating. Regardless of the learning

environment a large part of the student's educational experience depends on the effort and

attention that he/she devotes to learning. Some students are naturally gifted and learning comes

easy to them. Others require extensive study and attention to comprehend the material and show

that they understand it. There is a third group of students who, for many reasons, struggle with

the material and have difficulty succeeding academically. Cheating has been identified in each

of these classifications. In a 2006 study by Donald McCabe, he determined that "56% of

graduate business students admitted to one or more incidents of cheating in the past academic

year." (McCabe, P298.)

In order to control cheating, it is important to understand the various types of cheating

and understand why students cheat. Students may cheat for a number of reasons. In the McCabe

study it was concluded that business students were found to cheat because of a "succeed at all

cost" attitude. Other students may feel pressure from their parents, or may find cheating an

easier means to a good grade. Cheating, of course, is a risk. If caught, a student could fail the

test, fail the class, or worse of all, be expelled from school. The risks are high, yet students

continue to put their ethics aside for the chance at an easy "A" grade.

3.3.1. Cheating in a Traditional Class

In a traditional class a student may look at another student's paper, bring in a cheat sheet,

plagiarize, or use resources for a test or assignment that they are not permitted to use. Despite a

student's intention to cheat, in a traditional classroom cheating may be minimized by the

presence of the teacher. The teacher acts as a proctor during tests, keeping a watchful eye on the

behavior of the test takers. When monitored properly, it is very difficult for a student to get away

with cheating. For this reason, in a traditional classroom setting, a student may think twice

before taking the risk.

3.3.2. Cheating in an Online Class

In an online class, the cheating opportunities are very similar but technology and class

structure add new dimensions. Electronic versions of textbooks, for example, have introduced a

new dynamic to online teaching. Often the test bank questions that a teacher uses for courses are

provided by the publisher of the text book. This means that the test questions often have very

similar or identical language as the content of the book. Therefore, a student with an electronic

version of the text can search for specific key words to find answers very quickly. (Schmidt, P55)

This advantage may not be considered cheating when a teacher allows students to use their books

or notes, but it is considered cheating when the student is not permitted to use any outside

resources.

Students are also not always closely monitored during online exams. Not only does the

student have the classroom text at his fingertips, but he also has the Internet, or any other

resource available for any assignment or test. Students could go so far as to collaborate on a test

without the teacher's knowledge or pay another student to take an exam for him/her.

The evolving challenge of finding the balance of security, validation and the means to

prevent various forms of online cheating is not unique to any university. Several universities

have reported issues of academic integrity violations within online classes. Florida State

University was forced to place their winning football team on probation when at least twenty

football players and approximately forty other student athletes were involved in an online

cheating scandal. The players' suspension occurred for the Music City Bowl game against

Kentucky. The scandal was uncovered during an investigation into another cheating matter in

which a tutor supplied test answers to students and typed papers for five student

athletes.(Emerson, P1) The administration later discovered the additional academic offenses in

which a tutor provided answers to tests during an online music history exam. While the students

and the tutor were clearly violating academic code, there were factors that made it easy to cheat.

"Among them are the following: the exams were not administered by a proctor; the exam's

content didn't change from semester to semester; the professor posted the exam on a Monday

and gave students until the following Sunday to take it from any location on campus; and the

professor didn't scrutinize the final grade distribution, which showed an unusual number of high

scores." (Ibid)

In another online cheating scandal, Chris Avenir, a student at Ryerson University, was

charged with academic misconduct for hosting a study group on Facebook. The study group

included 146 students who collaborated on chemistry assignments. The instructor informed

students that homework assignments were to be completed individually; however, "students

argue Facebook groups are simply the new study hall for the wired generation." (Brown, P1) It

is much more common for students to share information in an online classroom format. In most

cases the learning management software provides functionality to collaborate and share. In a

time of Facebook, blogging and discussion forums, people are always wired and sharing

information. As these types of behaviors become commonplace in our society, the idea of

"collaborating" on a test may be more accepted.

In both cases, the students who were registered for the class were the same students who

were physically logging into systems and submitting the work, but were violating academic

policies. This proves that even by following HEOA rules and accreditation guidelines, students

could still cheat. With that being said, some believe that a student who is determined to cheat,

will find a way. Students are, of course, expected to act with the same moral and ethical

behavior in an online class as they would in a traditional class room. So why do they do it?

3.3.3. Reasons for Cheating

First and foremost, students are not being monitored online in the same way they are in a

traditional classroom. The online experience can be very private and secret. Many people have

a sense of anonymity online, believing that they can get away with something that they would

not be willing to do in person. Similarly, people are more likely to be unethical online than

compared to an in-person course.

Secondly, it is easier. The creator of an online class realizes that a student will have many

more resources at their disposal during a test, and therefore the tests are often designed as an

open book, open note or an open resource exam. Unfortunately, designing an effective online

class is more complicated than simply hosting the class online. A multiple choice test used in a

traditional class does not measure a student's comprehension the way the same test does online.

In the classroom setting, without the support of a book, notes or the Internet, a student would

need to know the material to correctly answer the questions. In the online format, it is possible

that anyone who knows how to page through the textbook or do a Google search could answer

the questions. Therefore tests need to be structured differently online. An essay test for example

might show that a student can interpret a question and apply learning from the course to craft an

appropriate answer. An essay test does not ensure that the student who turned in the test was the

same student who took the test. The online format also gives students the ability to share

information or collaborate on tests. It is possible that the students could be sitting in a dorm

room together, side by side, taking the same test and sharing answers. Collaborating on online

tests, when the teacher has indicated that this is not allowed, is not the first example of academic

dishonesty that has developed from advances in technology. Schools have been dealing with

plagiarism concerns for years. The Internet not only provides a wealth of information for

students to research papers, but it also provides vast opportunities to copy information and

submit the information as their own. Students go as far as to pay for papers from internet sites.

According to Fain and Bates, in 2001 an estimated 225 Internet sites provided term papers

including altermpaper.com, thecheatfactory.com, schoolsucks.com and geniuspapers.com. (Sileo,

P58)

3.4. Federal Regulations and Guidelines

The government is beginning to address these concerns directly. As the U.S. Secretary of

Education continues to instill requirements for online classes, academic institutions are forced to

adapt to stay in good standing. With the HEOA, the U.S. Secretary of Education has instituted

new requirements for recognition of students enrolled in online programs. This recognition

requirement applies to validation that the enrolled student is the same person who completes

online assignments, testing and coursework. In order to comply with this requirement, programs

must prove that they adhere to their university guidelines for validating online course work or by creating their own policies.   In addition, the program will need to submit an annual report or re-accreditation application to show that the program has met the new requirements.

Within the last full academic year, the summer of 2010 thru the spring of 2011, La Salle University has offered 167 credit earning online classes of which 80 classes were part of an accredited program. The Masters of Science in Speech-Language Pathology (MS in SLP) program offers an online graduate course for a graduate degree in speech language pathology. This program is currently accredited by the Council on Academic Accreditation in Audiology and Speech-Language Pathology. In addition, the Pre-Speech Language Pathology (PreSLP) program offers online prerequisite courses. With La Salle University's large online curriculum and accrediting bodies, the University is forced to take action to develop systems and/or procedures that comply with evolving government requirements.

3.5. Accreditation

Accreditation is extremely important in higher education. While there can be many accrediting bodies, the most common form of accreditation is "regional accreditation." In the United States there are seven regional accreditation agencies that are recognized by the federal government. The Middle States Commission on Higher Education (MSCHE) issued a document, "Why Is College Accreditation Important?" in which it explains that accreditation assures that a school does the following: (Why Is College, P2)

1. "Ensures teachings include analytical, communication and other basic 'lifelong Learning' college skills, expertise in the 'major' field, and additional courses needed for the type of education it offers. Students learning is assessed."

2. "Ensures that federal funds for students are available."

3. "Ensures resources, funding and services are available as needed such as faculty,

   equipment and student services"

4. "Ensures that credit Transfer and Degree Acceptance by employers and other colleges

   will probably be facilitated because a college's accreditation is usually considered."

5. "Ensures that management is performed by appropriate staff."

6. "Ensures that experts are used in reviewing the college, such as professors and college

   presidents."

According to the MSCHE, the accrediting body of La Salle University, distance education courses can satisfy the new rules of the HEOA, in the following ways: 1. An institution must have a process of validating that the student who has registered for the class is the same student who is submitting course work, taking tests and receiving the final grade. 2. Currently universities can use systems with secure logins and passwords or proctored exams to verify a student's identity.   3. The process used to verify a student's identity must protect the student's privacy. 4. A student must be told, during enrollment or registration, if additional fees will be required for identity verification. 5. Universities "should monitor the evolution of identity verification technology." (Higher Education Opportunity, P1)

4. Online Education at La Salle University

Understanding the challenges of online conduct, the techniques that students use to beat the system, and the governing principles of online education, we can begin to consider how enhanced system and procedural changes could benefit La Salle University's online programs. But first we need to understand how La Salle University's existing systems are used and the solutions that could be integrated into the school's infrastructure.

Blackboard is the primary Learning Management System adopted by La Salle University.

This web-based course management software is used by the faculty to enhance students learning experience and to host online classes. This system offers a variety of features described in section, 4.2.1 Blackboard, of this paper. "MyLaSalle portal" is used to provide a single point of entry to the email, Brother LUWIS, calendar, and University Intranet pages.

4.1. Types of Courses

The university offers face to face classes, web-enhanced classes, blended classes and fully online classes.

- **Face-to-Face courses** - Fully classroom oriented classes with all course materials delivered in person by the instructor without using an online course website. All communications and collaborations take place in the classroom.

- **Web-Enhanced courses** – Fully classroom oriented with the course website used as a repository of the course materials, as a tool to facilitate communications, and to provide links to the external resources.

- **Blended courses** – Face-to-face sessions are combined with online learning. The exact amount of time online is determined by the professor or the program's requirements. The online component of the class is more than half of the classroom hours. The class involves the delivery of curricular materials, access to the resources, submission of some of the online assignments, and online communication that can be asynchronous or synchronous,

- **Fully Online courses** – 100% of the course is completed online. Learning and assessments occur online and the class does not meet in person.

The exams and assignments for the online courses can be taken or submitted in various ways depending on the course instructor. The following options are currently offered:

- **Take exams and assignments online and submit them through Blackboard** – Exam requirements and a link to the exam are posted on Blackboard in the course materials. The students log on to Blackboard, navigate to the course, click on the exam link and take the exam online during a specific time period defined by the professor. The instructor may choose to allow only one question to be displayed at a time, to allow all questions to be viewed at once, to allow students to skip and return to questions, or to allow questions to be skipped or answered but not revisited. Students can also submit online assignments such as papers and projects.

- **Submit exam or assignment through email** – Exam questions or assignment requirements are provided by the instructor and the students must complete the assignment or exam and email it to the instructor by a certain deadline.

- **Take an exam at the designated exam facility** – Students have to sign up for a specific date/time and come to the institution's campus or designated testing facility.

4.2. Technologies for Online Education

In order to provide and support distance education offerings, La Salle University uses the following types of interactive technologies:

- Blackboard Learn™, Release 9.1.40071.3 Service Pack 4

- WIMBA Classroom

- Blogs and Wikis

- Audio Conferencing System

- DVD-ROMs, CD-ROMS

4.2.1. Blackboard

Blackboard Learn™ is the primary Learning Management System (LMS) at La Salle University. It is a comprehensive technology platform for teaching, learning, content management and sharing, assessment management, and measuring learning outcomes. This system can be used as a course supplement or for creation of a totally online learning experience. Blackboard uses the Single Sign-On (SSO) procedures that are employed in accessing "My La Salle's portal and Intranet." Each student has a secure log in and pass code, used to log in each time they access their course. Students can also directly access the LMS using the same credentials but bypassing the portal. LMS checks the student's credentials against the same security system used for portal access. This form of student verification ensures that only the student who is registered with the school can access their portal information, including the Blackboard learning module. Therefore, it is reasonable to say that a student who is participating in an online class, hosted on Blackboard, is verified every time he/she logs into the system.

4.2.2. WIMBA

WIMBA Classroom is another online system which is designed exclusively for education and allows the teachers and students to build relationships by combining interactive technologies with instructional best practices. According to WimbaClassRoom, (2009), WIMBA is a live, virtual classroom environment with robust features including audio, video, application sharing and content display, polling, participants list, and usage analytics tools. This is an excellent and effective tool for online learning. Wimba sessions are used at La Salle University for online classes, group meetings and discussions. Using a web cam, during synchronous sessions, can ensure that a student registered for the course, actually participates in the class discussions.

4.2.3. Blogs and Wikis

Blogs and Wikis are very helpful tools used by some of the faculty for collaboration and study related purposes. Blogs are web journals authored by an individual. A Blog allows visitors to leave comments and messages and can thus be used as a tool for discussions. Wikis are easy-to-setup, co-authored, simple web pages organized in a hierarchical structure that can be co-edited. Blackboard also includes Wiki and Blog functionality which some faculty utilize to support their online classes.

4.2.4. Audio and Video Conferencing

An Audio Conferencing System refers to a phone conferencing system that allows multiple parties to participate in a call at the same time. Video conferencing provides live video and audio, delivered over the Internet.   Conferencing is often used at La Salle University for guest speakers who are presenting remotely. Conference call functionality can also be used during WIMBA sessions instead of communicating online through a computer's microphone and speakers.

4.2.5. DVD-ROMs & CD-ROMs

DVD-ROMs and CD-ROMs are used to display some course materials. DVD-ROM drives are used to present videos during classes as well as for video recording student presentations. CD-ROM drives are used to install programs, copy CD's or share digital information.

4.3. Policies

4.3.1. Academic Integrity

La Salle University has a strong stance on ethical behavior and scholastic integrity. The first rule in the Community Standards section of La Salle University's Student Guide to resources rights and responsibilities, states that "All forms of dishonesty including cheating, plagiarism, knowingly furnishing false information to the University, forgery, and alteration or fraudulent use of University documents or instruments of identification," are subject to disciplinary action. (La Salle University Student Guide) Furthermore, the Academic Dishonesty section of the Student Guide defines cheating as "the act of wrongly using or attempting to use unauthorized materials, information, study aids, or the ideas or work of another. This includes giving or receiving unauthorized aid in the completion of such things as written assignments, quizzes, or tests. Submitting the same written work for two different courses qualifies as another form of cheating." (Ibid) Students are also asked to sign academic integrity contracts that state that the student will not cheat, and if they are aware of any cheating, report the incident to administration. With all of the attention to academic integrity and adherence to the policies, there are limited controls to ensure that polices are followed, especially in the online curriculum.

Blackboard offers some tools, such as SafeAssign™, that help instructors verify student work and ensure academic integrity. SafeAssign™ can be used to prevent plagiarism as well as to create opportunities to help students identify how to properly cite sources rather than paraphrasing. Students could take information from their friends or online resources and copy it into their online assignments. SafeAssign™ compares submitted assignments against a set of academic papers. It helps to identify areas of overlap between the submitted assignment and existing works.

SafeAssign™ is based on a unique text matching algorithm that detects exact and inexact matching between the paper submitted by the student and source material. According to SafeAssign (2011), Safe-Assignments are compared against several different databases, including:

- **Internet** – Comprehensive index of documents is available for public access on the Internet;

- **ProQuest database** - Over 1,100 publication titles and about 2.6 million articles from 1990s to present time are available and accessible exclusively through the Connelly Library's electronic databases;

- **Institutional document archives -A**ll papers that were submitted to SafeAssign by users in their respective institutions are stored in the archive;

- **Global Reference Database** - Papers that were volunteered by students from Blackboard client institutions to help prevent cross-institutional plagiarism are stored in this database.

La Salle University had used SafeAssign™ but, because it missed some references, it did not give acceptable results. The university now uses Turnitin.com which provides more accurate reports. When an assignment is submitted to Turnitin.com, it is compared against three major databases from the following sources:

- **The current and archived Web** – 14 billion Web pages from the current Web as well as archived web pages;

- **Students papers** – database of over 150 million stored and reviewed papers in the Turnitin.com paper base;

- **Content Partnership** – leading publishers, subscription-based publications, digital

    references collections, homework helper sites and books.

Professors may require students to submit written assignments to Turnitin.com at the

time of the assignment submission or professors may collect submissions and upload

suspicious assignments.

4.3.2. Privacy

To address the issue of potential online cheating, an institution can partner with an

outside company that provides hardware and software solutions that validate a student as they

access the schools learning management system. However with the many new technologies

available for student authentication and validation, privacy becomes a key concern. The HEOA

requires that a student's login information is secure and protects their identity. This requirement

is constant with the authentication requirements of the Family Educational Rights and Privacy

Act (FERPA) which states that a higher education institution will institute a "Reasonable

Method" to ensure that education records are only accessed by authorized individuals. (Federal

Register, P74840) While the federal government does not define what it means by a

"Reasonable Method," examples are used such as requiring photo identification, at least part of a

student's ID number, a student's pin number, his/her date of birth, a security question, or a

password. These requirements help control identity theft and unlawful access to private

information. As institutions continue to develop their technology and procedures for validating a

student's authentication, new privacy issues need to be considered. Authenticating a student's

biometric information, for example, is a newer system that is being instituted in many

universities. As this information is gathered, it is imperative that the data remain secure. Also

video cameras have become a key piece of hardware in authentication systems. They are used

live to monitor a student or they can record a student as he/she completes a test.

Recently, the idea that cameras could capture private moments and be viewed or shared beyond its intended, authorized, viewers has become a real concern. In 2010, the Lower Merion School District was sued for allegedly spying on a student in his home, while using a school issued laptop. (Frommer, P1) In this case someone used remote access to the computer to activate the built in camera and watch the student, without his knowledge. There are additional concerns for solutions that use cameras to proctor exams. Schools need to be sure that the people who are reviewing videos are permitted and qualified to do so. They should also consider what happens to any videos or material that is recorded of a student.

As an institution expands its systems, process and procedures for online student validation and privacy should be a top priority. The institution should ensure that all student material is secure and only accessible by appropriate individuals. Institutions should also provide clear and transparent information to student and faculty about how personal information is gathered, maintained and shared.

La Salle University has documented privacy policies and guidelines that outline the acceptable use and regulation of a student's login credentials. According to La Salle University's Acceptable Use Policy, "You are responsible for the security and use of your password and accounts. It is prohibited for any user to use another user's password or account. Users must not attempt to gain access to another person's computer, accounts or data." (La Salle University Acceptable Use Policy) In addition, the school describes the control systems that are in place to secure a student's personal information. According to the privacy policy of the MyLaSalle Portal, "the site has security measures in place to protect the information under our control from loss, misuse, unauthorized alteration." (Privacy Policy –Mylasalle, P1) These policies adhere to

the HEOA regulations, but do not ensure that a student is not cheating. The privacy of the student

is protected by the student, since the student has the credentials. In addition, Social Security

Numbers are never used in an effort to protect the identity of the students. Instead a university-

generated ID number is assigned to each student.

4.4. Online Class Design and Support Resources

The La Salle University Online Committee provides expectations and support for faculty

who are designing an online or hybrid course. The goals of the committee include:

1. Help maintain a consistent student and faculty experience in all La Salle University

    Online courses;

2. Ensure that faculty and students are using products that technical support staff and

   instructional designers are able to support;

3. Maintain a technical environment that is consistent, sustainable and reliable for all users;

4. Remain in full compliance with best practices and federal and state laws that govern how

   universities gather, transmit, store and provide secure access to student and employee

   data. (La Salle University Online, P1)

The committee offers "Professional Development Workshops," to help faculty prepare for

teaching an online course. The committee also does a very good job of setting expectations and

time commitments required to prepare for a new online course. For example, when designing a

new course, the group suggests that teachers begin developing their online course one semester

or three months in advance. It also suggests that faculty meet face-to-face with an instructional

designer at least weekly in preparation for the new course. The time with the instructional

designer is designed to enhance lectures for the online format, prepare assignments to be more

succinct, and create discussion forums to promote interaction and collaboration in the online

environment. The committee is also focused on the online tools, providing direction and education on Blackboard and Wimba functionality.

The overall analysis of La Salle University's procedures and online tools shows that the university understands the need to carefully design an online curriculum and follow online best practices. Additionally, the university's policy to use secure login credentials to access La Salle University's portal and Blackboard system is an acceptable solution to the current accreditation guidelines of the HEOA. However it does not verify that the student, who logged into the portal, is the same person who actually takes exams. Students who are willing to cheat might also be willing to share their username and passwords. Without any form of additional validation, other than the student's username and password, the university has no way of knowing that any violation occurred.   Therefore there is no proof that a student registered for the online course, is the same student who participates and completes the course.

5. Solutions to Prevent Online Cheating

5.1. Best Practice Strategies

There are several ways that an institution can help ensure academic integrity in their online programs. The WICHE Cooperative for Educational Technologies (WCET) in collaboration with UT TeleCampus of the University of Texas Systems, and the Instructional Technology Council has developed a document that provides "Best Practice Strategies to Promote Academic Integrity in Online Education." (Best Practice Strategies) This document suggests several techniques, processes and procedures that should be implemented to help promote academic integrity. The document starts by suggesting that institutions should document a policy for academic integrity that is easy to find, and describes repercussions for violation of the rules. It also recommends that core curriculum and orientation include lessons

on ethical behavior, and that all suspicious ethical behavior be reported. Finally it suggests that

all online course material, tests and assignments be secured with a student login and password.

The document also suggests best practices in online curriculum. It starts by

recommending that classes remind students of the institution's academic honesty policy and that

online classes include an ethical case study where appropriate. It goes on to suggest that rules

should be discussed in classes so that expectations are clear, and there are no questions as to

what specific behavior violates school policy.

The document also suggests that institutions should provide support for faculty and

students directly to help promote academic integrity. This is achieved by including integrity

strategies into faculty training, assigning an integrity specialist to support faculty and performing

systematic plagiarism evaluations of student work. Students should be supported with clearly

documented processes, clear examples that explain the difference between collaboration and

cheating, and statements that describe what level of collaboration is allowed for each assignment.

Students should also be reminded, in all syllabi, of academic honesty with links to institution

polices.

Finally the document suggests best practices for "Assessment and Evaluation" of the

student. Students should be provided with clear grading rubrics for the course and all

assignments. To ensure that the institution's learning management system supports academic

integrity, faculty should be trained on all functionality. Most LMS allow tests and assignments

to be configured in a way that reduces a student's opportunity to cheat. WCET recommends six

testing configurations for tests and assignments.

First, test banks should contain more questions than the student will be tested on and test

questions should be randomly assigned, so no two tests are identical. By shuffling questions on

each test, it is very difficult for students to share answers. Second, multiple choice answers

should be shuffled across tests so that the correct answer option is different on one test than it is

on another. Third, the timing and number of attempts on a test, or assignment, should also be

controlled. Tests should be completed and submitted before a student can leave the test. Once a

student submits the test, the system should prevent reentry to the test. In addition, students

should be given a short period of time in which the test can be completed. Students should be

given one or two days to access and complete the test. These limitations will ensure that a

student does not access the test, and then spend several days collaborating or researching

answers, before accessing the test again and posting the answers. Fourth, to reduce copying a

test, questions should be presented one at a time. Fifth, a computer lock down process should be

used to ensure that a student cannot access the Internet, communication software, or other

computer applications during the test. Finally, the testing format should be heavily considered

and varied. Instructors should require essay format assignments such as papers, essay tests and

discussions, where students need to read a question and formulate a written response. This will

require that the student understand the course material, and can craft an appropriate answer.

Essay tests can provide evidence that a students work is not his/her own based on the language

and style of writing. Teachers can also use a plagiarism checker to review the students work, to

be sure it is original. It is also a good idea to require that written assignments be submitted in

phases. For example, students may first be required to submit a paper thesis or scope, followed

by an outline, then an initial draft, and finally a final paper. This process ensures that a student is

thinking about each component of the assignment, and provides the teacher with opportunities to

see if a student's work is copied.

   Understanding the challenges of online conduct, the techniques that students use to beat

the system, and the governing principles of online education, we can begin to evaluate how

technical solutions, enhanced system, and procedural changes can benefit La Salle University's

online programs.

5.2. Technology Solutions

Software and hardware companies address the problem of cheating with different types of

solutions. Many of these solutions utilize authentication and verification practices to ensure that

the student is the same student who has registered for the class. All authentication and

verification techniques that are currently available can be divided into the three following

categories:

- **Monitoring** – The identity and behavior of an individual is evaluated through the use of

  electronic devices such as web cameras.

- **Biometrics** – The identity is verified based on an individual's physical traits or

  behavioral characteristics.

- **Challenge-Response Questions** – An individual is prompted to answer a question

  ("challenge") that requires knowledge of private information.

While some solutions utilize only one verification category, others use a combination of

these techniques.

5.2.1. Acxiom Identity-X

Acxiom Corporation is a software company that addresses specific business challenges

with solutions tailored to their customers needs. It was proactive in finding a solution to address

the issue of academic integrity in online education. According to Jortberg (2011), Acxiom

developed an on-line real-time identity verification service called Acxiom Identify-X

Authenticate. This service is in a secure cloud and it generates challenge questions and then

scores the responses. Acxiom Identify-X is a very cost effective way to address the academic

integrity of online programs. It works by proactively verifying student's identity in real time by

matching a student's directory information (name, address, phone number) to their daily updated

database. The database consists of millions of public and non-public proprietary records.

According to Acxiom Identify-X™ Verify (2011), the company obtains public records from the

state, federal, or governmental entities that are available for public inspection. The records can be

obtained from resources such as telephone directories, newspaper reports, publications, and other

sources. The matching information is then computed into a probability score, called a verification

score. The verification score is a complex formula that indicates the probability of identifying an

individual. This solution does not require hardware. Verification is performed over the Internet

without any intrusions to the learning process. Only the student enrolled in a course is able to

answer the question used for authentication. Some exam questions might include: "Based on

your driver's license do you wear corrective lenses?" or "How many fireplaces did you have in

your last residence." (Acxiom Identify-X, P2)

In the process of authentication, no student information is released. This ensures that

there are no privacy issues with the FERPA. The system relies only on directory information and

is FERPA compliant. Based on the results from the research performed by Sullivan University

during the fall of 2009 survey of 85 students, the students feel that "the system gives respect to

student privacy" (Jortberg, 2011) which is shown on Figure 1 below.
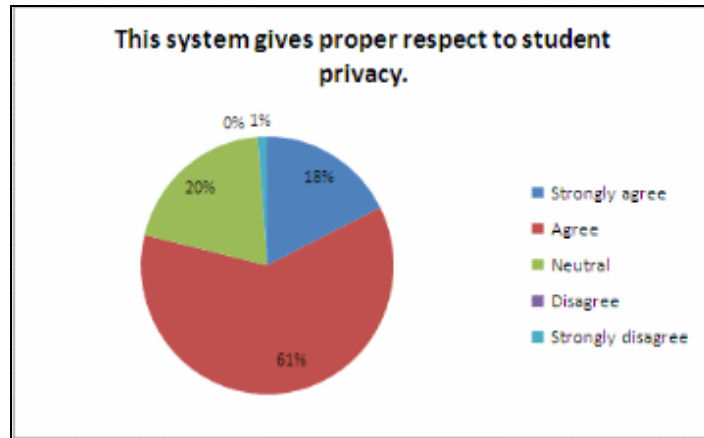
Figure 1: Acxiom Identify-X Respects Privacy (Jortberg, 2011)

According to Jortberg (2011), this system is very effective and works well for the education

clients. Jortberg (2011) reported an "average 95% to 97% pass rate between 10/01 and 12/15

2010" The pass rate reflects the number of individuals who successfully confirmed their identity.
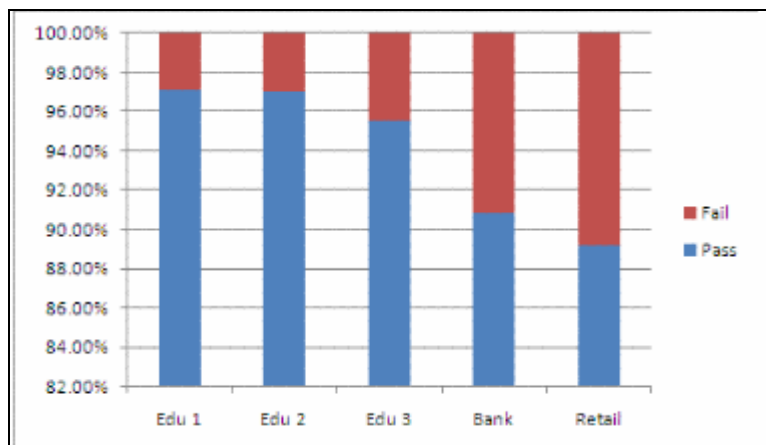
**Figure 2: Effectiveness in Education (Mike Jortberg, 2011)**

5.2.2. Acxiom and Blackboard

In 1999 Acxion partnered with **Blackboard** Inc. to improve student verification at

colleges and universities. This partnership offered affordable and simple solutions that improve

academic integrity and verification policies. Acxiom Identify-X supports Blackboard Learn™

which is used by La Salle University. "Acxiom Identify-X is now available pre-installed to Blackboard Learn™ clients that have upgraded to Release 9 Service Pack 2. Clients who have upgraded to this version are now only required to enter the configuration settings delivered by the Acxiom Risk Client Relations team within two business days of completing the registration process." ("Acxiom Blackboard Integration", 2011) La Salle University currently uses Blackboard Learn™, Release 9.1.40071.3 Service Pack 4. La Salle University completed testing the trial version of Axiom Identify-X. According to Ed Nickerson, the CIO of La Salle University, all members of administration participating in testing agreed that the solution works well in successfully identifying the student's identity in real-time but it does not ensure that the same student who logged into the exam actually takes the exam. Also, even though Acxiom Identify-X is pre-installed to Blackboard, it is not included into Blackboard license fee. In order to use this solution, there is a $12 - $15 fee per student per course.

Many universities which use Blackboard have implemented the student verification options provided by integration of Acxiom's Identify-X service. Universities who are using Blackboard find that Acxiom's Identify-X is a reliable authentication tool. According to Bailie, Jortberg, (2009), National American University (NAU) in collaboration with Acxiom Corporation and Blackboard Inc., successfully tested a solution intended to be an additional step in the identity verification of remote learners enrolled in the university's online courses during 2008 and 2009. This approach proved to be successful and it is currently used when Acxiom Identify-X is embedded into Blackboard with the other clients.

The flowchart below describes the steps for the Acxiom Identify-X solution.
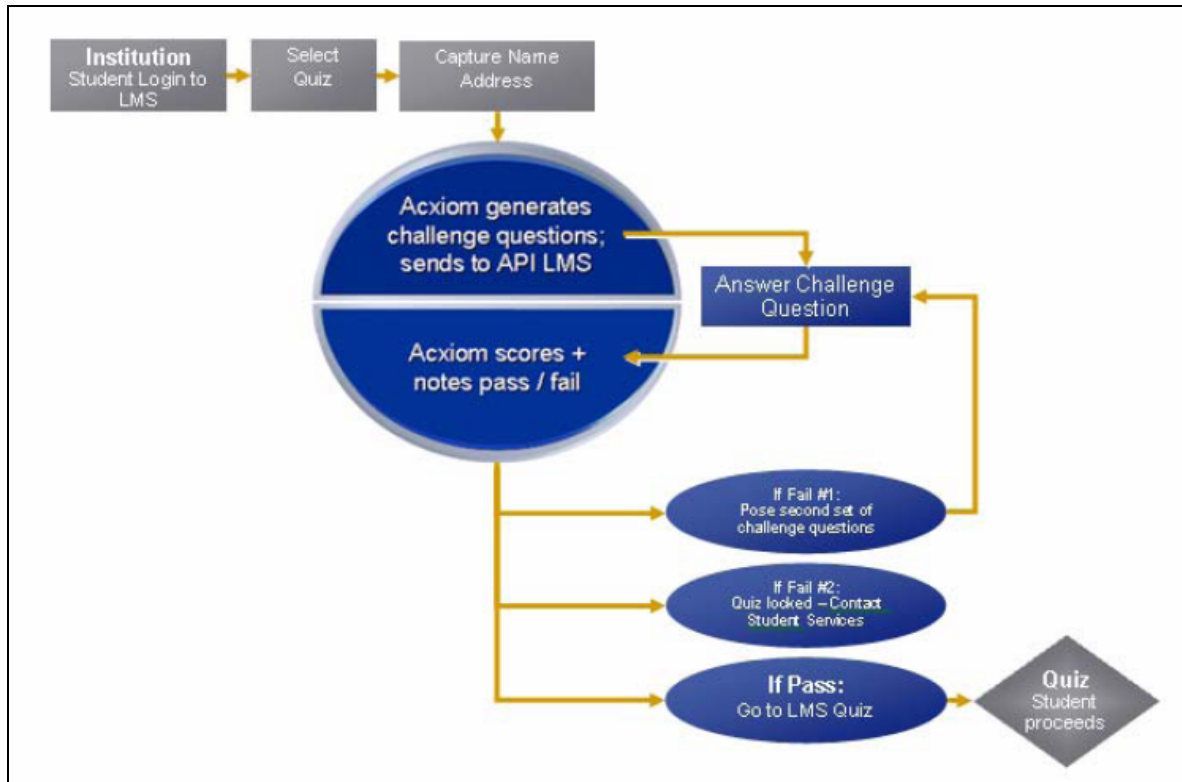
Figure 3: Acxiom – Blackboard NAU Pilot (Bailie, Jortberg, 2009, p. 203).

The Acxiom Identify-X process can be described in three steps:

1. Courses that will include the challenge question authentication are selected by the school.

2. During the course registration, students should be informed about the online classes requiring authentication. They should have an opportunity to opt out and register for the course that requires a different type of testing. The students registered for these courses enter the Blackboard LMS by logging in with the user ID and password, assigned by the university, and then navigate to their assigned course.

3. When the students enter the exam for this course, they will be asked a series of challenging questions to complete authentication. The unanswered or incorrectly answered questions will not authenticate the student and deny them access to the exam.

In this process, the Acxiom Identify-X strategy governs the challenge questions, how many questions will be given, pass/fail thresholds, and a questions weighting. The university controls which courses or assessments will require the student authentication, where in the process the authentication will take place (challenge questions can be posted before the exam or as a student enters the exam room), how many students will be participating in the authentication, and how frequently the students will be authenticated.

While the Acxiom solution offers a reliable method of authenticating a student, the Acxiom Corporation recognizes the limitation with this approach in that this system does not ensure that somebody else is not in the room with the student, providing support, as they take the exam. That is why Acxiom Identify-X partnered with ProctorU who provides outsourced proctoring services for Acxiom Identify-X. The combined technique provides a different solution.

5.2.3. ProctorU

ProctorU is a solution allowing students participating in online classes to take exams anywhere they have access to the Internet. According to Schaffhauser (2010), this service was developed at Andrew Jackson University for its internal use. "Students were complaining of the inconvenience and cost associated with locating a proctor and traveling to the proctor's location for their final exams. So Andrew Jackson University, where I was a director of technology in 2008, decided to develop an online proctoring system", said Jarrod Morgan, the vice president of ProctorU (Telephone interview, March 03, 2011). Eventually the university commercialized the solution into a separate corporation.

The ProctorU solution monitors the student's physical and computer environments during an exam by connecting to the student's computer and video camera. According to Jarrod Morgan

(2011), the biggest advantage of ProctorU system is its layered approach to the student's identity

verification. First, a student is asked to display a photo ID in front of the camera. Second, the

proctor takes a snap shot of the student's face. The photo is kept in the secure database for future

authentication. The third layer includes a student answering the challenging questions. This

process is supported by Acxiom Identify-X solution. This multilayered approach ensures a better

authentication process.

In order to use ProctorU, a student needs "a PC: A well-working computer running

Windows XP or higher with 500 MB of RAM or higher, a webcam with 680x480 video pixel

resolution, headphones or working speakers connected to the computer, a microphone connected

to the computer, a reliable high speed internet connection (minimum 768 Kbps/128 Kbps), a web

browser with Adobe Flash Player installed (Flash Player 10 recommended), authority to allow

remote access to the computer , by a proctor" (To Be Successfully Proctored by ProctorU, 2010).

According to ProctorU Demo (2010), getting started with ProctorU is easy. The student

has to create an account by providing a valid email address and phone number. After that, the

student needs to logon to the schedule a week before the exam and reserve a time slot for the

required exam. Once logged in, the student sees the schedule grid showing available time slots.

After finding the suitable time, the student has to click on the open slot. He/she will be asked the

name of the exam and estimated time needed for the exam. Then a confirmation message

appears. When it is time for the student to take the exam, he/she returns to the schedule and logs

back in to ProctorU.   ProctorU will provide step by step instructions for the student to access the

exam room. The student is required to click on the option "Allow" that allows ProctorU to

monitor their computer:

Figure 4: Adobe Flash Player Settings (ProctorU Demo, 2010).

When the exam room is loaded, a student can see himself in a webcam window. At this time the system calls the proctor who appears on the screen as well. First, the proctor asks a student to display the room environment by moving the camera around. Second, a student has to provide his/her name, school, telephone number and share the screen with the proctor, so his/her work can be monitored during the exam, see Figure 5:

Figure 5: Connect Your Screen (ProctorU Demo, 2010).

Third, the proctor walks a student through the authentications process:
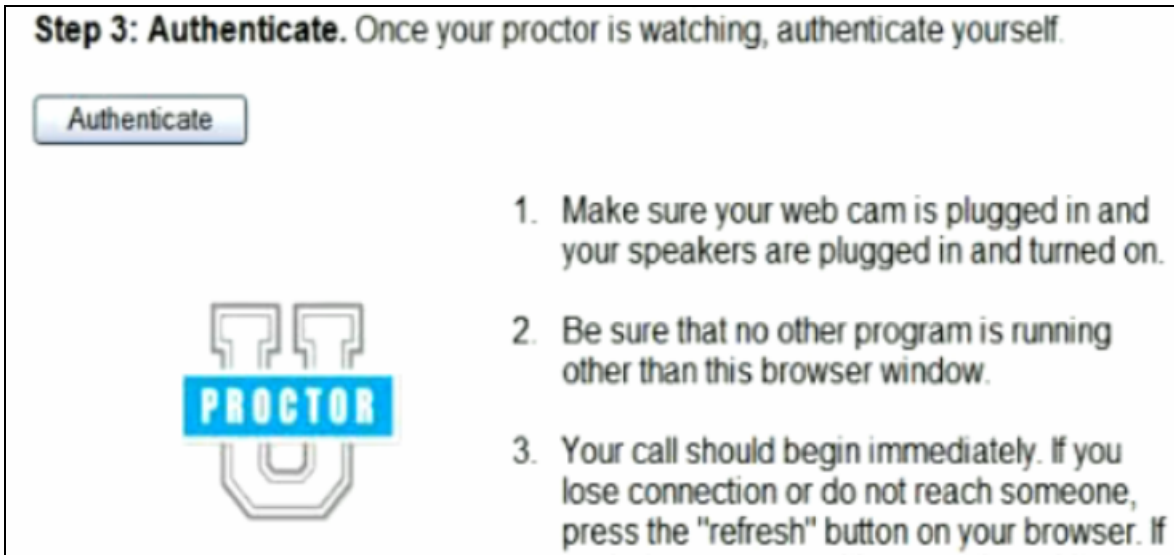
Figure 6: Authenticate Screen-1 (ProctorU Demo, 2010).

The authentication process includes answering a series of challenge questions. These questions are random questions that were not previously given to ProctorU. ProctorU uses Acxiom Identify-X solution for the authentication and verification process. Jarrod Morgan indicated that in order to pass authentication, a student has to successfully answer the majority of the questions (Telephone interview, March 03, 2011).

Figure 7: Authenticate Screen -2 (ProctorU Demo, 2010).

Figure 8: Answering Challenging Questions (ProctorU Demo, 2010).

Once a student passes authentication, he/she is ready to take an exam. The proctor will continue to monitor the student throughout the exam and provide assistance. If a proctor notices any suspicious behavior, he/she first gives the student a warning. Then if it continues, the proctor reports the student's behavior to the school. It is up to the school to review ProctorU's report and address the situation accordingly.

Jarrod Morgan (2011) explained that in order for the institution to start using ProctorU services, the institution has to submit information to ProctorU regarding the exams. This information should include exam names, schedules, and estimated number of students taking the exams. Upon receiving this information, Proctor U will set up the exam in their system at which point the institution is able to use the service. There is no hardware or software installation required. There is a flat fee of $20 - $25 per student for the first two hours of the exam and then $8.75 /per each additional hour. Acxiom services, technical support, and proctor's services are all covered by this fee. There is no video recording at any time which eliminates any privacy issues. Also, since the student's screen is shared with the proctor during the exam, there is no need to

lock down the student's computer because the proctor will see if a student starts using external

resources that are not permitted by the teacher. The proctors are available seven days a week, 9

a.m. to midnight. ProctorU does not believe that the entire student's workspace should be

monitored (i.e. using 360 degrees camera) because they can see the student face closely and

determine where their attention is focused. They found it very easy for the skilled proctor to

detect any suspicious behavior based on the student's facial expression.

According to Partner Institutions (2010), ProctorU is currently used by 44 colleges and

universities including some in Germany and China. "There is a 20% - 30% growth every sixty

days in the number of the exams taken through ProctorU" (Jarrod Morgan, 2010).

5.2.4. Securexam Remote Proctor (SRP)

Securexam Remote Proctor (SRP) is a complete secure online testing solution offered by

Software Secure. According to the Software Secure Product Demo, Securexam Remote Proctor

(2011), "it provides the same level of integrity as that found in the proctored exam environment

without a need to go to a campus, find a human proctor or travel to a test center." It is a small

stand alone device that connects to a test taker's computer via USB and uses a combination of

biometrics, monitoring, and patented software allowing the students to take exams virtually

anytime and anywhere while maintaining a high degree of academic integrity. This product

addresses almost every aspect of online exam security. It allows authentication of the student

using a fingerprint scanner. It uses video and audio monitoring to capture all activities during the

exam. It restricts access to external resources.

A demo from Software Secure Product Demos, Securexam Remote Proctor (2011),

describes the SRP system which consists of a hardware and software component. The hardware

device features the biometric fingerprint reader for the student authentication, a microphone to

capture the audio events during the exam, and a camera that captures a 360 degree view of the

exam room. It ensures that any activity that occurs in the room, such as someone entering the

room to provide help, using a book or the answers posted on a wall, will be captured.

Figure 9: Software Secure Securexam Remote Proctor features finger print biometric device, microphone, and 360 degree camera (Software Secure Product Demos. Securexam Remote Proctor (2011).

The second component, of the system is the Securexam software. This software

technology prohibits access to the Internet, Instant Messaging or hardware during the exam. In

addition, the software disables the computers copy functionality, ensuring that the students

cannot copy the exam and share it with other students. Software Secure can setup the exceptions

to allow certain URL's or applications to run while in test. It is important because some of the

tests, for example exams using programming components, might require some of the resources to

be accessible in order to function properly. The Securexam browser software works well with

most learning management systems such as Blackboard, WebCT, Angel or Modul. There is no

costly integration work required and the software can be utilized out of the box.

In order for a student to use SRP, a student needs a computer, the remote proctor device, and needs to download and install the Securexam software. According to Mark Musacchio, Business Development Manager from Software Secure (personal communication, March 09, 2011), the remote proctor device can be distributed through various channels. It can be sent to a student directly from Software Secure, or from the online store that Software Secure works with. Another option is for a student to get the device from the school or the school's bookstore. The advantage of using a bookstore is that a student can use financial aid or grant money to purchase the device. A renting model is also available. A student can rent the device from Software Secure or from the school. Most schools using Securexam Remote Proctor, have the students pay for most or all of the cost of the system by buying the product, or setting up a fee structure per term/semester.

The process of installing SRP is simple and easy. The student needs to insert the arm of the device into the base, plug the USB cord into the USB port and navigate to the Software Secure website to download the software and manual over the Internet.

Figure 10: Installed Securexam Remote Proctor device (Securexam Remote Proctor, 2011)

After the device is installed, the student has to double click on the SRP icon which automatically brings him to the school's course management system login. Mr. Musacchio

(personal communication, March 09, 2011) explained that Software Secure configures their

Securexam browser to point to the schools login page. The first time each student uses the

Securexam Browser they will be asked to provide a unique license code. This license code will

tell the browser which LMS to point to, and the rules it uses to function. Since SRP fully

integrates with La Salle University's LMS, Blackboard, it eliminates any additional need for

teacher or student training.

During a one time enrollment process SRP prompts the student to place a finger on the

biometric reader to collect a valid ID and takes the student's picture that later is used for the

visual authentication. A summary screen displays what information is collected and the

enrollment data is stored on a Software Secure server. The entire enrollment process takes less

than 60 seconds.

A demo from Software Secure Product Demos, Securexam Browser (2011) shows that at

the exam time the students have to log on into the LMS using their user ID and password. Then

they have to navigate to the exam the same way they always do within LMS. At this point the

students go through the simple authentication process by providing a finger print. Upon

successful authentication, the students get to the page that protects the individual exam. At this

page the Secure Exam browser will fill in the password automatically in an encrypted format that

cannot be read by a test taker. Since the students do not know this password, this feature prevents

non-Securexam browser users from entering the test. Within the SRP environment the security

will not allow access to any information or applications outside of the exam. The patented

security prevents access to a hard drive, web, IM or any other external resources. During the

exam, the device actively monitors a complete 360 degree view of the exam environment and all

sounds and motions are recorded. The recorded material can be later reviewed by an instructor

to ensure that a student complied with the exam policy. The school defines who will be reviewing the video. Software Secure offers video review services where they review each exam video and report back to the teachers to let them know what they have found. Or, the school can have their own faculty and staff to review the exam videos. Once a student exits an exam, RPS security ID is turned off, the desktop is returned to pre-exam state and the completed exam is automatically stored by the course management system.

For the instructors the process of creating an exam is the same. They create the exam with their preferred browser. The only thing that is done differently is that the instructor uses the password created by Software Secure password generator rather than making up their own password.

Following the exam, each student's exam video will be reviewed to ensure that they complied with the test instructions. It is up to the school to decide who will be reviewing the videos. Software Secure offers video review services where they would review each exam video and report back to the teachers to let them know what they had found. Another option is for the school to have their own faculty and staff to review the exam videos. If a school decides to review the video recording, institutional users are provided access to the Software Secure website. The reviewer can rewind the footage back and forth without losing data. Exams are searchable by a teacher, class, student, or exam title. By using SRP, the institution can monitor the room with the student just as if they were sitting in a room with a traditional human proctor. Using the Exam Reviewer, you can easily flag anything considered suspicious and within a note box, explain what the violations were in the exam room. The reviewing tools provide an easy way to rate the severity of suspicious behavior.

Mr. Musacchio indicated that the company is "very sensitive to concerns about privacy.

They store the files on a secure server in an encrypted format. They do not allow anyone to access these files without having a valid username and password in their system – teacher or administrator. Students will never be able to access these records. They delete all files containing video records at a date specified for the school. They usually hold them for a predetermined amount of time and then delete them. Often times the time period is the same length of time that a student has to challenge a grade. This time period is fully decided by the school." (Personal communication, March 07, 2011)

Mr. Musacchio explained the pricing model for this product which includes $150 one time flat fee for the hardware device, and $30 per year for a software license. The school pays for the support and service which includes review of the videos that are taken and report to the school. The rate for video review is $0.08 per exam minute. The review of a two hours exam will cost $9.60. The company offers a flexible pricing model and is willing to work with an institution to meet their pricing needs. (Telephone Interview, March 04, 2011)

There are more than 35 institutions successfully using Securexam Remote Proctor from Software Secure including Drexel University and New York University School of Law.

5.2.5. Biometric Signature ID

Biometric Signature ID (BSI) is a technology and software development company located in Dallas, Texas, which has developed several worldwide applications including a student's ID verification software called BioSig-ID™. It is a patented biometric software technology that uses multi-factor authentication. BioSig-ID™ identifies a person based on their behavioral characteristics. These characteristics are unique to a person and cannot be duplicated or shared.   The system is designed to evaluate a person's behavioral characteristics by evaluating their signature. The person draws the signature and BioSig-ID™ analyzes the individual traits of

the signature by using the complex algorithms. "The way a person draws the password is captured and broken down into basic elements including speed, direction, length, height, width, angle, and number of strokes. These elements are compared during subsequent sign-in attempts to determine whether the user is the same person who created the profile" (Products, 2011).

According to the Test Drive Demo (2011), there is a one time enrollment required which takes only a few minutes and requires only a mouse, touchpad, or stylus. No additional hardware is needed. The users logs into the authentication system by providing a username, first name and last name and then selects the pointing device that will be used to draw the signature. It could be a mouse, a stylus, or touchpad:
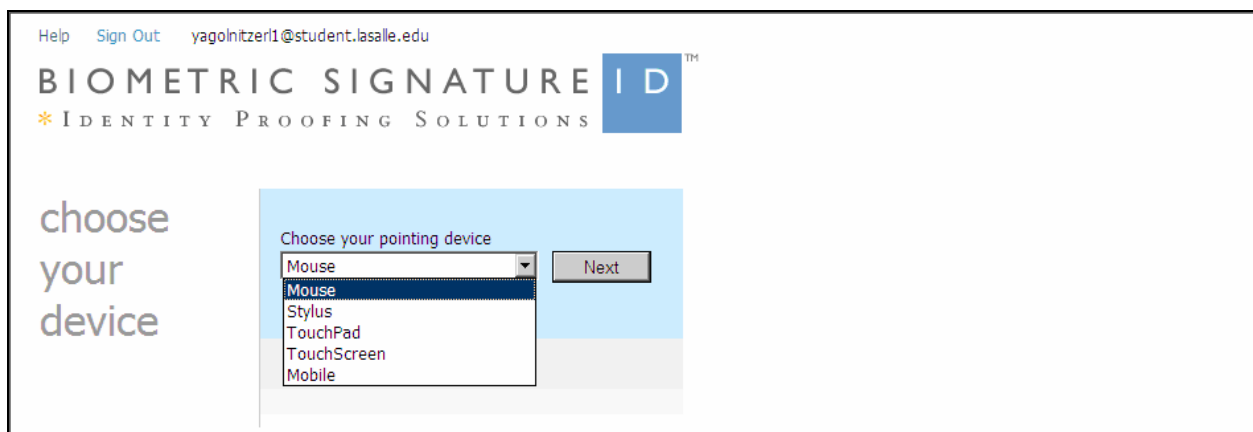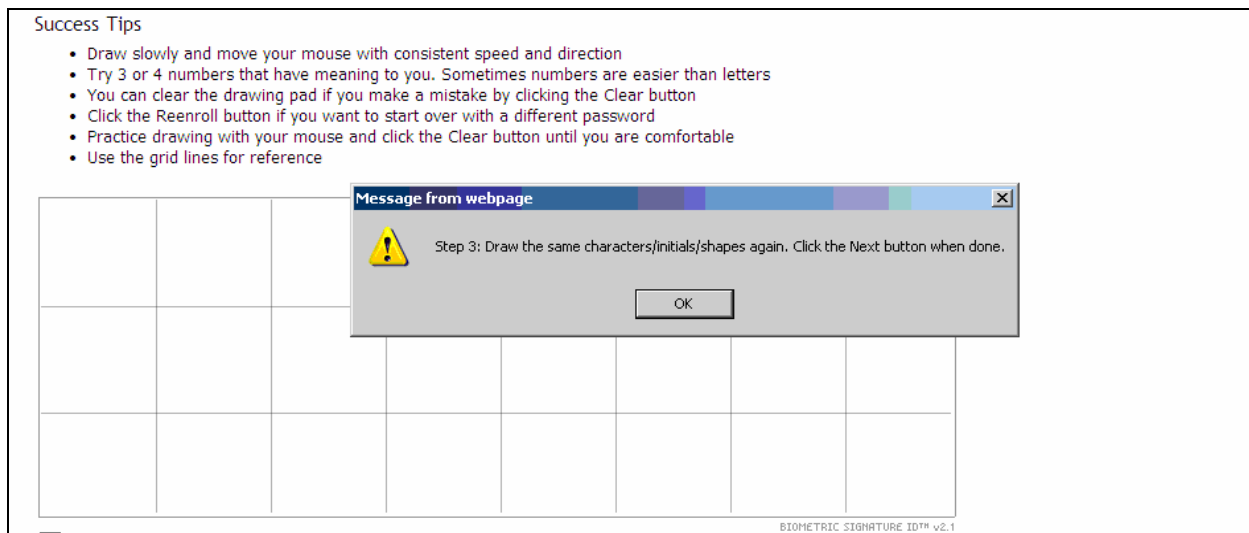

Figure 11: Test Drive Demo (2011)

Then they are asked to draw their 'unique' signature (secret code that has a meaning to them) in a box provided. This is not a real "signature" written in cursive but instead could be any character, number, shape, or initials. This process is repeated three times to build a profile which will be kept in a secure database. This profile will be later used to authenticate the user.
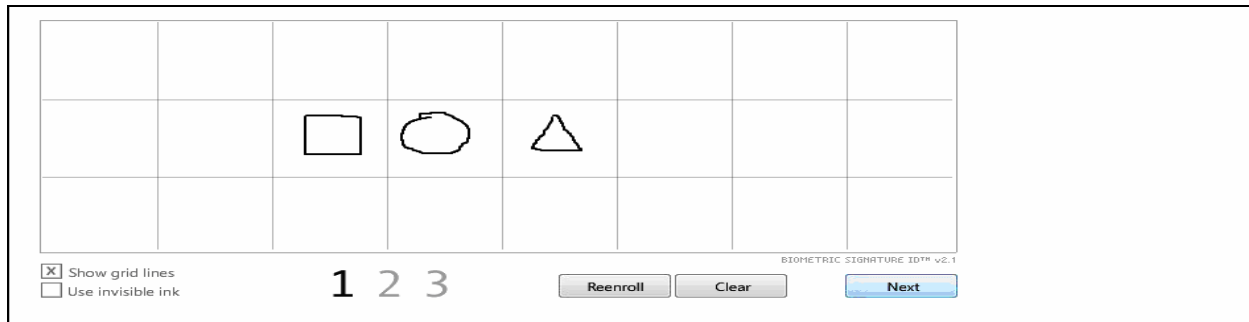
Figure 12: BioSig-ID™ Drawing Screen, Test Drive Demo (2011)

Figure 13: BioSig-ID™ Instructions Screen, Test Drive Demo (2011)

After this part is completed, the user is directed to create an alternative access method called Click-ID. This feature replaces tokens, smart cards and can augment pins and passwords. The users are presented with several pictures. The first step is to select the picture that has relevance to them and click on it.
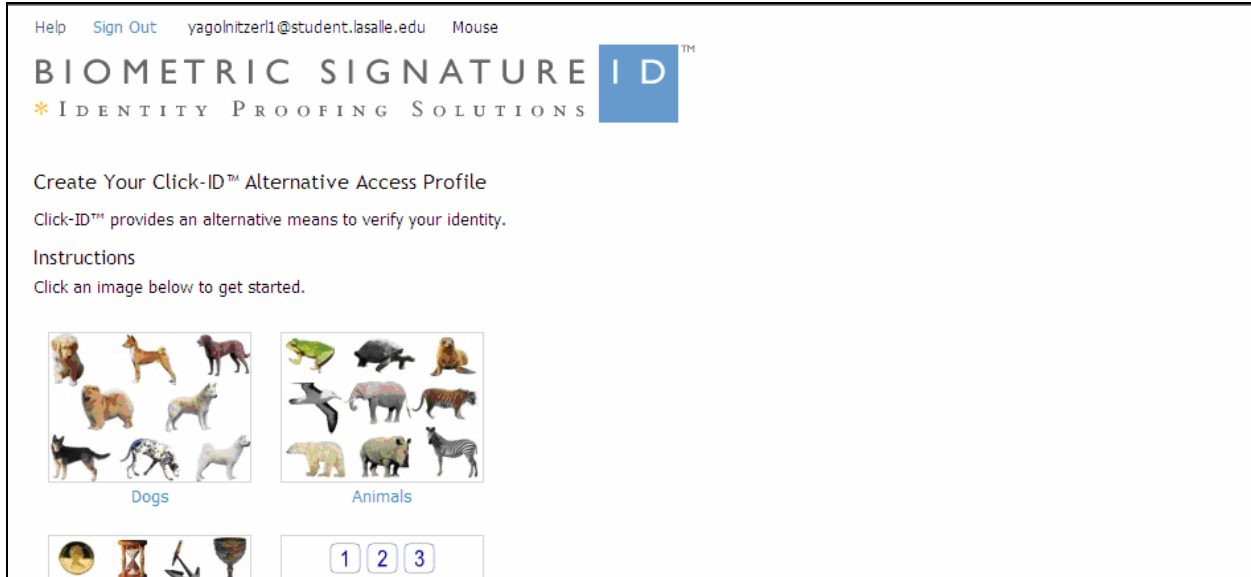
Figure 14: Click-ID Selection Screen-1, Test Drive Demo (2011)

Once the picture is enlarged, the users are asked to select three or more objects and click

on these objects using the pointing device. After selecting these objects, the users have to click

on "Submit" and "OK". The choices will be highlighted. Then the users have to select the items

in the same order and repeat this process three times.

Figure 15: Click-ID Selection Screen-2, Test Drive Demo (2011)

After completing this process the system will display a message that the users were

successfully enrolled with the BioSig-ID™ and with Click-ID. Whenever the user returns to

authenticate their identity, they will be presented with the grid and asked to draw and validate

their signature. If it matches the profile setup during authentication, access will be granted.
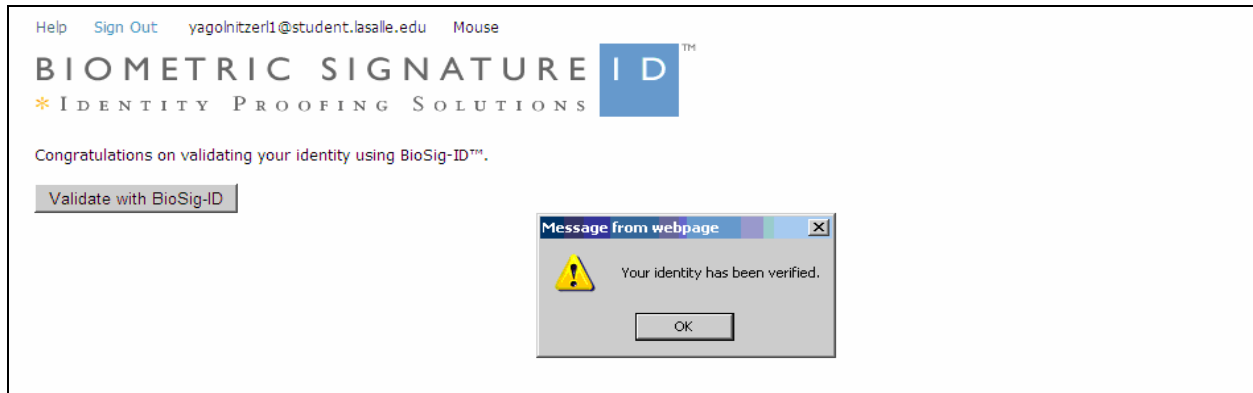
Figure 16: BioSig-ID™ Identification Confirmation Screen, Test Drive Demo (2011)

If the system cannot successfully authenticate the user through BioSig-ID™, the second

layer of security will be activated and the user will be asked to authenticate through Click-ID.

The user has to select the picture previously selected during the enrollment, click on the right

objects in the correct order and click on "Submit". If the selections are correct, the user will be

directed to re-enroll in Bio-Sig-ID. Access is granted. Therefore, this solution uses multiple

levels of security and can replace passwords or tokens that could be easily stolen. BSI's

biometric technology is different from the traditional biometrics like fingerprint scanners because

they do not require any special hardware installation. It can be successfully used for student

identity validation during an online course and at their proctored exam site. It can be used

efficiently in the distant learning environment, including online discussion groups, attendance

checking, and paper submissions. This software also incorporates "something that you know"

making it a true multi-factor authentication system and ideally suited for remote authentication

for students.

BioSig-ID has completed several pilot proofs of technology with University of Maryland

University College, University of Texas Systems and Houston Community College, where

students validate their identity, for an online course, at their proctored exam site. (Levey, S.,

Maynard, J., 2011) Following the pilots, BioSig-ID implemented full deployments at each

school. The cost for this solution is $12 which includes a license fee /per student/ per semester

(or per year, if student is enrolled all year) which could be included into the course registration

fee. BioSig-ID™ is inexpensive, user friendly, solution with no hardware required, that offers

two security levels.

Besides authenticating a student, BSI offers another interesting solution to reduce

cheating among students. They offer uSignOnline™ software that allows a user to create a

signature by using a pointing device on electronic documents. This electronic signature creates

an audit trail and evidence of the transaction. This solution was developed based on the concepts

designed by Dr. Dan Ariely of Duke University and James B. Duke, Professor of Psychology and

Behavioral Economics and bestselling author and researcher in the field of dishonesty.

His works suggest several reasons why students cheat.   One of them falls into "psychological /

internal social norms model" (Biometric Signature, 2011) which describes cultural/socialization

and lack of self awareness, meaning: "Everyone seems to do it why not me? It is acceptable, I

don't know any better, I know people who have cheated so it is OK" (Biometric Signature,

2011). BSI suggests that this attitude could be addressed by drawing attention to morals and

standards to enhance the social norm. (Biometric Signature, 2011) By using uSignOnline to sign

their commitment to the student code of conduct, BSI believes that cheating will be significantly

reduced. "This unique solution permits the school to place their student code of conduct on their

web site and have their students sign a web form using their regular mouse or touchpad. This

simple process takes several minutes and creates a PDF contract that is as legal as using pen and

paper signatures. A copy of the signed form is auto e-mailed to the student and to the school with the time and date stamp, IP address, unique user ID and web session ID as proof of acceptance of the terms of the contract", Biometric Signature, (2011) Many of these systems utilize authentication practices to ensure that the student doing the work is the same student who has registered for the class. At least two of the solutions create a proctored environment, similar to a traditional proctor. Both of the proctored solutions are far more secure and use several different forms of student validation, but have additional cost associated. With each solution there are pros and cons that should be evaluated against La Salle University's needs and standards.

5.3. Comparison of the Products

During our research of the various technology solutions, we tested some of the products or viewed the demos offered on their websites. Table 5-1 provides the comparison of the products based on our experience with the solutions. We measured our experience by initially comparing the ease of use and ease of learning. While we found all of the solutions easy to use and learn, we provided specific information in the table. These factors were the first of several key measures considered in comparing each software package.

Table 5-1: Comparison of the Products by Ease of Learning and Ease of Use

Solution Name	Ease of Learning	Ease of Use
Acxiom Identify-X	Based on recorded presentation offered by Jortberg (2011), it is very easy to learn how to use this product.	It is very easy to use. There are two screens for students. It takes 10-20 seconds to answer the challenging questions.
Acxiom ProctorU	Based on the demo available at website, it is easy to learn how to schedule the exam and how to take an exam. Once connected to the proctor, he/she can provide technical assistance.	At the time of the exam the student has to follow the simple screen instructions. After connecting with the proctor, the student has to follow the proctor's instructions. The authentication process takes 10-20 seconds to answer challenging questions. After authentication, there is no difference

Solution Name	Ease of Learning	Ease of Use
		between taking an exam using ProctorU and taking a regular class exam.
Acxiom - BB	Based on the results of the trial version testing performed by La Salle University, it is very easy to learn how to use this product.	It is very easy to use. There are two screens for students. It takes 10-20 seconds to answer the challenging questions in order to enter the exam site.
Secure Remote Proctor	Based on demo, it is easy to learn how to install hardware and to download software by following instructions. The enrollment process takes less than 60 seconds.	Since SRP is integrated with the LMS used by the University, the student navigates to the exam the same way. Authentication process is quick. After authentication, there is no difference between taking exam using SRP and taking a regular online exam.
BioSig-ID	-Based on the performed test drive for SigID, it is easy to learn how to create an account and setup a user profile. The screen is user friendly and the instructions can be displayed if needed.	Once enrollment is completed, it is easy to use. It takes 10 seconds to be authenticated.
uSign	-Based on the performed test drive for uSign, the Student Code of Academic Conduct form was displayed without any additional instructions needed.	It was easy to sign the form and to receive the confirmation that could be printed.

Table 5-2 provides the comparison of the researched products by several other criteria

which are crucial to the technology solution selection process. We used the following categories

to compare the products:

1. Methodology   8. Pricing Model

2. System Requirements   9. Average Cost per Student

3. Student Enrollment / Registration Process   10. Limitations

4. Student Training   11. Advantages

5. Faculty Training   12. Examples of Installations

6. Ease of Implementation   13. Scalability

7. Privacy

Table 5-2: Full Product Comparison

	Acxiom Identify-X	Acxiom - ProctorU	Acxiom - BB	Secure Remote Proctor	BioSig-ID
Methodology	Challenge questions based on third party questions	Audio and video web conferencing via webcam. Screen monitoring service with live, certified proctors.	Acxiom Identify-X methodology using challenge questions based on third party questions is embedded into Blackboard Learn LMS.	Biometrics (fingerprint and Photo ID). Monitoring (video and audio). Restriction of using external resources (patented software). Special hardware.	Biometrics (behavioral characteristics)
System Requirements	No dedicated hardware required. No software installation required.	Webcam. Link to the exam site could be within LMS or anywhere. No software installation required.	No dedicated hardware required. No software installation required.	Hardware (biometric finger print reader, 360 degree camera, microphone). Patented software download required.	Pointing device (mouse or touch pad or stylus or touch screen). No dedicated hardware required. No software installation required.
Student Enrollment / Registration Process	No enrollment required.	One time student enrollment includes creating an account. For each exam, student has to schedule exam in advance.	No enrollment required.	One time student enrollment includes: Installing hardware device; Downloading patented software; Collecting finger print; Collecting photo.	One time enrollment includes: Creating an account; Enrolling into BoiSig-ID by drawing unique signature; Enrolling into Click-ID by clicking on several objects on a picture.
Students Training	During the course registration, students should be informed about the online classes requiring authentication.	Before taking an exam, students have to be provided with the instructions that include the ProctorU's website and direction to create an account with ProctorU.	During the course registration, students should be informed about the online classes requiring authentication.	During the course registration, students should be informed about the requirements for taking the online exams using SRP. It should include overview with instructions about purchasing/renting hardware, website name and overall	

	Acxiom Identify-X	Acxiom - ProctorU	Acxiom - BB	Secure Remote Proctor	BioSig-ID
				introduction. Student needs to be given a unique license code	
Faculty Training	Faculty has to be trained to provide instructions to students.	Faculty has to be trained on exam setup with ProctorU (provide exams information, # of students, etc).	Faculty has to be trained to provide instructions to students.	Faculty training required on setting up an exam. If the university is going to perform video reviews, faculty has to be trained on how to use Exam Reviewer site.	Faculty has to be trained to provide instructions to students
Ease of Implementation	Implementation in less than a week. .	School has to send exams information to ProctorU. Once information is added to ProctorU, the school can start using it.	Implementation in less than a week.	Easy and quick installation process.	Easy to implement.
Privacy	System relies only on student's directory information (name, address, phone number). No student information is released during authentication - this ensures that there is no privacy issues; FERPA compliant.	No student information is released during authentication. No video recording is done during the exam.	System relies only on student's directory information (name, address, phone number); No student information is released during authentication - this ensures that there is no privacy issues; FERPA compliant.	Files with recordings are stored on Software Secure server in encrypted format. Accesses to the files are granted to individuals who have a valid user ID and password. Students are never allowed to access the files. Files are deleted from the server on a date specified by the school.	Does not collect any student's personal information. Stores students unique writing /clicking styles in secure database.

	Acxiom Identify-X	Acxiom - ProctorU	Acxiom - BB	Secure Remote Proctor	BioSig-ID
Pricing Model	License - $12 - $15 per student per course. Covers service.	Flat fee of $20 - $25 per student for the first two hours of the exam, and then $8.75 /per each additional hour. Acxiom services, technical support, and proctor's services are all covered by this fee.	Cost is not included in Blackboard license fee. Fee of $12 - $15 per student per course (covers all exams included into the course).	Hardware costs $150 (one time fee) Software license - $30 / year. If school chooses to use Software Secure service to review the videos, it pays for this service. The pricing for the video and review is $.08 per student per exam minute Could be additional fee for S/H of the hardware device.	License - $12 / per student / semester or per year if the student is enrolled all year.
Average Cost Per Student	$12 - $15 per student per course	Depends on number of exams student has to take. The cost for one exam: $40 - $50 for 2 hrs exam $48.75 - $58.75 for 3 hrs exam	$12 - $15 per student per course. It covers unlimited exams included into the course.	$150 (one time fee) $30 per student per year Reviewing video – $9.60 for 2hrs exam	$12 per student per year
Limitations	Does not provide monitoring therefore cannot ensure that somebody else is not helping a student in the room during the exam. Does not prevent students from using additional resources.	Cost – more expensive compare to the license fee.	Does not provide monitoring therefore cannot ensure that somebody else is not helping a student in the room during the exam. Does not prevent students from using additional resources.	Privacy could be a concern Extra cost for the hardware device.	Does not provide monitoring therefore cannot ensure that somebody else is not helping a student in the room during the exam. Does not prevent students from using additional resources.
Advantages	Reliable method of authenticating students (95-98% pass rate among education clients).	Provides reliable authentication (uses Acxiom solution). Eliminates the need for the school faculty participating in exam	Reliable method of authenticating students (uses Acxiom solution) FERPA compliant.	Provides reliable authentication and monitoring. Fully integrates with Blackboard LMS; Provides the freedom to take exams at times and dates	Multi-factor authentication; Can be used with Blackboard LMS. Low cost.

	Acxiom Identify-X	Acxiom - ProctorU	Acxiom - BB	Secure Remote Proctor	BioSig-ID
	Can be integrated with multiple LMSs. No enrollment required. Quick implementation. Low start up costs. FERPA compliant.	while having exam proctored by certified live Proctor. Monitors student's computer environment but does not lock the computer. Reports suspicious behaviors to the school. FERPA compliant.	Quick implementation	convenient for students; Eliminates the need for a live proctor; Has flexibility to lock certain environments.	
Example Installations	-Arizona State University -Charter Oak State College -DeVry University -ECPI College of Technology.	44 schools, including -University of Florida -University of Arizona -University of Maryland	-University of Southern Mississippi -Charles Darwin University -University of Cincinnati	> 30 schools, including -New York University -Drexel University -Georgetown University -Troy University	-University of Maryland University College -University of Texas Systems -Houston Community. College
Scalability	High Expanding the use of this product will require purchasing additional licenses.	Highest Nothing is required from the school in order to increase the number of students using ProctorU.	High Expanding the use of this product will require purchasing additional licenses.	High Expanding the use of this product will require purchasing additional licenses.	High Expanding the use of this product will require purchasing additional licenses.

5.4. Case Studies

Several universities around the country have implemented some of the solutions explained above. As a result of the FSU Football incident, FSU officials have made changes to the online music class to prevent similar types of cheating in the future. One of the primary changes made is that no two exams are exactly the same. Students are now required to take tests for online classes at a testing center, at which students are required to show photo identification and a login with an individual password that only they should know. Finally, the university has put limits on who is eligible to proctor an exam, excluding anyone who has ties to the athletic department. (Emerson, P2)

Other universities have implemented solutions for online course validation. Drexel University, for example, has offered online classes since 1996 and has incorporated Securexam Remote Proctor from Software Secure to validate an online student's identity before taking a test, locking down their workstation so that they can only access permissible applications and information, and recording their environment as they complete exams. Drexel has required that Software Secure be used in all Nurse Practitioner programs since 2007. Cheryl Portwood, Coordinator of Quality for Drexel's distance programs in Nursing, was responsible for evaluating the security options on the market. She believes that the implementation of Software Secure went well and has been a smooth transition for the students and faculty. Portwood was quoted as saying, "I am absolutely committed to secure testing," "I see it as the key underpinning for online education."(Drexel University, P2)

The University of West Alabama instituted an online learning division to the school in 2002. The popularity of the program grew both nationally and internationally until 2009 when

the online population surpassed its on-campus population. (The University of West Alabama, P1)

UWA offers two undergraduate degree programs, and seventeen graduate programs. According

to a case study by Software Secure, early in the program UWA required that students come to

campus for testing, or go to a testing center. If a student could not go to a designated testing

center, or campus, a tedious process was established where the students would send the name and

email address of a proctor to the teacher for review. The teacher would look up the proctor to be

sure they qualified to proctor the exam, and then contact the proctor with the test and details of

the test.

UWA decided that they required a better solution that would meet the needs of all

students in the online program, regardless of their location. A solution needed to meet the needs

of the students and faculty, reduce the grind in the current process, and ensure that the school met

the changing requirements of the Higher Education opportunity Act. UWA decided to investigate

the Software Secure solutions. Dr. Wayne Bedford, Associate Dean in the School of Business,

organized a demo of the Securexam Remote Proctor from Software Secure. Together with thirty

students the software and hardware was demoed. The entire demo was videotaped and shared

with the rest of the faculty. In addition, Dr. Bedford required the students to fill out a

questionnaire that rated their experience with the system. The pilot was a success with the

students, faculty and administration. Dr. Bedford presented the findings of the pilot to UWA's

Director of Information Systems. Together they implemented the solution at UWA. "The

university decided to mandate the use of Remote Proctor for all online courses starting in the

spring of 2009, which meant our first deployment would involve about 2,300 students all coming

on to the Remote Proctor at one time."(ibid, P2) The university was careful to communicate the

new requirement to all students and provided a support hotline. The implementation was a

success, with very few issues. The number of tests taken with Remote Proctor was nearly 7,000,

across 1,500 students. In the following term Remote Proctor was used for nearly 11,000 exams

and the number of students increased to almost 2,500.

6. Implementation Challenges at La Salle University

There may be room for enhancement in the current processes and systems to better ensure

online academic integrity. But knowing there are opportunities does not ensure that action will

be taken to enhance the situation. Universities are similar to any business. Money is closely

monitored and the value of a change is carefully weighed against all other opportunities and the

ROI that a change will provide. To better understand where this issue ranks we consulted with

Ed Nickerson, CIO at La Salle University. Mr. Nickerson explained that the issue of online

student validation has been considered and partially evaluated. The evaluation proved that an

enhanced validation system works well in the current architecture while the faculty and

administration who were involved in the evaluation found the solution to be easy to use and

effective. However, when the additional cost of the solution was compared to other priorities, it

lost momentum. The current priorities of the Dean and the Provost focus on enhancing the

learning experience more so than controlling academic integrity. This is evident by the technical

projects that are currently being prioritized, including: Smart Classrooms, WiFi throughout the

dorms, lecture capture solutions, 24/7 help desk support, or enhancing the Dan Rodden theater

sound system.

Mr. Nickerson explained that enhancing the online systems and procedures will be

driven, primarily, by one or both of the following. First, if the government requires a more strict

control system. At that point, the institution would be required to make changes. Though no

specific requirements exist yet for the use of a validation system, outside of secure usernames

and passwords, experts believe that the government may expand system requirements in the future. Second, if the priorities of the university shift in a way that the cost of a validation solution is worth the assurance that it provides, then a change may be considered.

Even after a new system or process is introduced it is not always adopted and used well. Change management and adoption are also components that need to be considered when making system and process changes. Without user adoption and accountability driven by administration, changes can be wasted. Faculty should be made to feel empowered and their input considered in enhancing the policies and procedures. In addition, any changes to systems or procedures, and expectations of their use should be explicitly disseminated to the faculty. This will help drive accountability and adoption by the faculty.

7. Recommendations

7.1. Procedures and Practices

La Salle University uses many of the best practices that have been described in this document such as: encouraging access to instructional designers, providing online course best practices, and participating in professional development workshops. La Salle is an accredited university and has a reputation for academic excellence. Many faculty members utilize some of the recommended testing procedures described in this document. And most classes discuss, at some level, the academic rules that must be followed.   However, it may be some time before a technical enhancement is considered; in the meantime, there are several procedural enhancements that could optimize online integrity processes.

La Salle University could consider this document a starting point for a deeper investigation into standardization and security of their online curriculum. The process of standardizing and securing should start with a comprehensive evaluation of all online programs.

These programs could be evaluated to ensure that they adhere to the academic excellence

standards that have been established in La Salle University's traditional courses, and comply

with the best practices provided by La Salle University's Online committee. For classes that do

not meet these standards, or for teachers who are struggling with an online class design, the

university could require online instructional design support that evaluates learning goals and

learning management system functionality. The university could also consider feedback from its

students. Though each course at La Salle University concludes with class and teacher

evaluations used to enhance future classes, it would be valuable to consult directly with select

students, once they complete the online course, to understand where classes or teachers could

focus better in the future.

Perhaps the greatest opportunity to enhance online academic integrity is further

evaluation and standardization of online testing practices. Online class testing standards could

be expanded, clearly defined and required for all online classes. Standards could include many

of the best practices described above including:

- All online tests could be timed with a single attempt permitted.

- Essay tests could be considered.

- Multiple Choice tests could be based on a large test bank that selects a subset of
   questions for each exam and organizes them randomly

- No two tests could be identical.

- Test questions could be presented one at a time.

- Writing assignments could be submitted in phases.

La Salle University could also consider how electronic copies of text books provide a

new advantage to students during exams. To control the impact of this new technology, an

instructor can do the following:

- Create tests that require short answers and interpretation of concepts;

- Require that all test answers be in the student's own words, no direct definitions
  are permitted;

- Do not use questions directly from the text test bank. Text provided test questions
  are often similar to those provided in the student's text. Using an electronic copy
  of the text book makes searching for the questions and answers very easy.

Additionally, faculty can utilize current Wimba functionality to help monitor students

during exams. By requiring that all students take tests at a specific time, while using their web

cam throughout the test, the teacher can periodically check in with one student at a time. This

will give the teacher an opportunity to see if the student is taking the test unassisted while also

giving the student a chance to ask any questions.

Finally, La Salle University could consider face-to-face proctor solutions on campus or

designated testing locations.

7.2.   Technology Recommendations

In addition La Salle University could consider expanding its student validation systems

and test monitoring processes. We recommend one of the two systematic monitoring solutions

ProctorU or Secure Exam Remote Proctor. Both solutions utilize a secure validation that ensures

that the student who is taking a test is the same student who is registered for the class. Both

solutions ensure that the student taking the test is only using the resources that have been

permitted by the instructor. The solutions are secure and are careful to consider the students

privacy. Finally, both solutions can be integrated with La Salle University's current learning

management system without extensive customization. We recommend that a committee be

assembled, in collaboration with La Salle University's online group and Ed Nickerson, to

evaluate the possible solutions and work with ProctorU or Software Secure to run a pilot and

proof of concept. The results of this pilot could be shared with La Salle University's

administration to determine if the tools can become a standard in all of La Salle University's

online programs. Implementing one of these two solutions, or a similar technical solution, will

provide the following:

- Enhanced academic integrity;

- Assurance that a student who is completing exams is the same student registered
  for the class;

- Control over the resources a student can use during an exam; and

- Understanding and readiness for future legislation requirements.

8. Conclusion

In summary, systems and procedures could be in place to make cheating difficult, or at

least discourage the cheaters from attempting to cheat. Academic integrity and institution-wide

process and procedures are critical to the image and reputation of an institution. As we have

discovered, there are many rules required by federal law, to ensure that an institution continues to

receive federal funding, student financial aid and stays in good standing with accrediting

agencies. Experts believe that federal regulations will continue to become more stringent to

control academic integrity. With La Salle University's base polices and online infrastructure in

place, additional process and systems could be a viable option for the future of online programs.

The programs and procedures recommended in this paper could be evaluated by faculty,

administration and technical resources who oversee the schools course design and online system

architecture. Finally, as changes are defined for online programs at La Salle University, a

committee could be created to continue evaluating best practices and cutting edge technology in

online course design and management. This committee may be organized by the La Salle

University Online committee, but could include cross functional representation from various

parts of the schools faculty, administration and technical staff. The committee could also

propose standards that all online programs could follow. It could evaluate online courses on a

regular basis to be sure they meet the requirements set by the school. Finally the committee and

La Salle University should "never stop exploring" opportunities to enhance online education and

distance learning, with a focus on enhancing academic integrity.

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